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Ambulatory Care Sensitive Conditions among All-Payer Claimants with Intellectual and Developmental Disabilities

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Abstract

Inpatient hospitalizations for ambulatory care sensitive conditions (ACSC) among beneficiaries with and without intellectual and developmental disabilities (IDD) were examined using Medicaid and commercial claims from 2010-2014 in STATE REDACTED FOR REVIEW. IDD was defined with ICD-9-CM codes using algorithms from the Centers for Medicare and Medicaid Services, and inpatient encounters were identified using the Healthcare Effectiveness Data and Information Set (HEDIS). In adjusted analyses, beneficiaries with IDD had more hospitalizations for ACSC than those without IDD in both insurance groups. Differences in patterns of ACSC prevalence, comorbidities, and hospital admissions between the Medicaid- and commercially-insured groups show the value of using all-payer claims data, when possible, to understand health needs and health care utilization of insurance beneficiaries with IDD.

Keywords: intellectual and developmental disability, ambulatory care sensitive conditions, health care utilization, inpatient care

Approximately 7.37 million people in the United States have an intellectual or developmental disability ([IDD]; Larson et al., 2018), and people with IDD generally experience more health difficulties than people without IDD (Anderson et al., 2013; Cooper et al., 2015; Havercamp & Scott, 2015; Krahn, Walker, & Correa-De-Araujo, 2015; Reichard & Stolzle, 2011; Cooper et al., 2015). Individuals with IDD have also been associated with relatively high rates of emergency department (ED) visits and inpatient hospitalizations (Balogh, Brownwell, Ouellette-Kuntz, & Colantonio, 2010; Hosking et al., 2017; Perry et al., 2014). Concerns have been raised that these high rates of health care utilization may reflect either poorer quality of care or simply less availability of primary care for individuals with IDD compared to the general population (Balogh, Ouellette-Kuntz, Brownell, & Colantonio, 2013; Hand, Boan, Bradley, Charles, & Carpenter, 2019; Hosking, et al., 2017; Lennox & Kerr, 1997). Investigating these concerns is key both to advance health equity for people with IDD and to address health care costs associated with hospitalization (Anderson, Armour, Finkelstein, & Wiener, 2010; Armour et al., 2009; Carey et al., 2017).

In this study, we seek to improve understanding of preventable health disparities between health insurance beneficiaries with and without IDD by investigating ambulatory care sensitive conditions (ACSC) as a proxy for quality of care markers. ACSC comprise conditions that are manageable, and potentially preventable, through consistent, high-quality primary care; as such, hospitalizations for these conditions can indicate reduced access to routine, outpatient care (Ansari, Laditka & Laditka, 2006; Johnson et al., 2012; Moy, Barrett & Ho 2011; Oster & Bindman, 2003; Roos, Walld & Uhanova, 2005). Or, they may indicate a lower quality of primary care (Balogh, Ouellette-Kuntz, Brownell & Colantonio 2013; Hosking, et al., 2017; Lennox & Kerr, 1997). We examine differences between people with and without IDD in the

prevalence of inpatient hospitalizations for ACSC among all-payer claimants. In our study, all-payer claimants include those covered by commercial health insurance and Medicaid. Commercial insurance refers to a health plan that a claimant has purchased privately or received through an employer or family member. Medicaid refers to public insurance that is funded jointly by states and the federal government and is available for individuals who qualify based on specific criteria such as income or disability status.

Background

Previous research using administrative claims data for health surveillance has shown that hospitalizations for ACSC can occur much more frequently among Medicaid beneficiaries with IDD than those without. McDermott, Royer, Mann, and Armour (2018) found South Carolina Medicaid members with mild and unspecified intellectual disabilities averaged more than one ED visit per member year for ACSC. Using administrative billing data from the same state, Hand et al. (2019) observed that people with an intellectual disability (ID) only or ID plus autism spectrum disorder were significantly more likely than people without disabilities to be hospitalized for ACSC. Two additional studies of decedents in Western Australia and in New South Wales reported that people with intellectual disabilities were more likely to present with, be admitted for, and die from an ACSC (Brameld, Spilsbury, Rosenwax, Leonard, & Semmens, 2018; Trollor, Srasuebkul, Xu, & Howlett, 2017).

A higher prevalence of inpatient hospitalizations among people with IDD may simply reflect that, in general, this is a sicker population (Balogh, Lake, Lin, Wilton, & Lunsky, 2014; Cooper et al., 2105; Havercamp & Scott, 2015; Peacock, Amendah, Ouyang, & Grosse, 2012; Reichard & Stolzle, 2011). A recent systematic review found that many studies to date have not accounted for this possibility when investigating health care utilization patterns (Dunn, Hughes-

McCormack, & Cooper, 2018). However, several studies have shown that higher rates of hospitalization for ACSC persist even when controlling for differences in general health (e.g., McDermott, Royer, Mann, et al., 2018).

For example, a Canadian study found that people with an intellectual disability were six times more likely to be hospitalized with ACSC in adjusted comparisons (Balogh et al., 2010). Balogh et al. (2014) also found people with IDD were more likely to undergo inpatient treatment specifically for diabetes and asthma, and they were more than twice as likely to be hospitalized for diabetes in prevalence-controlled analyses. The incidence of hospital admissions among people with disabilities almost triples that of people without a disability, and in a model adjusting for comorbidity, smoking and economic deprivation, the incidence rate among people with ID for ACSC was about five times greater compared to those without disabilities (Hosking et al., 2017).

At the same time, analyses of all-payer health insurance claims have shown that, in general, Medicaid beneficiaries are hospitalized less frequently for ACSC than claimants who have commercial, also known as private, insurance (Dresden, Feinglass, Kang, & Adams, 2016; Starfield & Shi, 2007). Key differences in both demography and health indicators also emerge when contrasting Medicaid- and commercially-insured claimants with IDD (Phillips et al., 2018). Taken together, these findings suggest the importance of including commercial claims to provide a more complete understanding of preventive primary care utilization among people with IDD.

Study Aims & Hypotheses

The present study aims to illuminate areas of opportunity to improve the health of adults with IDD. To this end, we add to a growing body of knowledge related to hospital utilization for ACSC among people with IDD. Using health insurance claims data and taking into account

potential differences in underlying comorbidity between people with and without IDD, we attempt to distinguish appropriately higher utilization from suggested disparities in access to or quality of preventive care. Importantly, our use of all-payer claims data enables us to identify potential inequities in care between Medicaid- and commercially-insured beneficiaries by examining whether the frequency or cause of inpatient admissions for ACSC differ by insurance type.

In theory, the experience of ACSC should be similar between health insurance beneficiaries with and without IDD when controlling for underlying comorbidities. However, based on existing knowledge of inequities in health care access and preventive health maintenance for people with IDD (Balogh et al., 2013; Hand et al., 2019; Hosking et al., 2017; Lennox & Kerr, 1997; Meade, Mahmoudi, & Lee, 2014) , our first two hypotheses propose that even when accounting for overall health (i.e., comorbidities), insurance beneficiaries with IDD will be hospitalized for ACSC more frequently than people without IDD in both the Medicaid cohort (H1) and the commercial cohort (H2). Given prior research highlighting differences in ACSC and IDD by insurance type (Dresden et al., 2016; Phillips et al., 2018; Starfield & Shi, 2007), hypothesis 3 (H3) suggests that patterns of hospitalization for ACSC will differ among Medicaid-insured versus commercially-insured beneficiaries with and without IDD.

Methods

Data

Data for this study come from one state's all-payer (Medicaid and commercial) claims files from 2010 through 2014. The data files were accessed through a limited use data agreement with the state Department of Health and Human Services and state Department of Insurance, and approval for the analyses was granted by the university Institutional Review Board. Data for all

12 months of the study period were available for 2010 through 2012 and 2014; however, Medicaid data for 8 months of 2013 (April through November) were unavailable and are not included in the data set. To ensure a non-biased comparison with commercial claims, data from the missing months were intentionally removed from the commercial claims analytic file. The Medicaid cohort excludes any individuals who were also enrolled in a commercial insurance plan; the commercial cohort does not exclude those also eligible for Medicaid (28,082 or 1% of the commercial cohort), as the commercial insurance would be the primary payer. All data files were stored on a secure computer in a locked location in accordance with state and university protocols. Analyses were conducted using Stata/MP 13.

Participants

To meet the study's inclusion criteria, insurance beneficiaries had to be enrolled in the same type of insurance (Medicaid or commercial) for at least 11 of 12 months in any calendar year during the 5-year study period. Lab claims were excluded, and analyses were restricted to claimants under 65 years of age in order to avoid confounding Medicare eligibility. We limited the sample to beneficiaries ages 18 or older, as the ACSC analyzed were only relevant to adults.

Participant characteristics considered in the analyses included age, sex, residence in an urban or rural county (i.e., inside or outside a metropolitan statistical area, respectively), and IDD status and type. Reliable race and ethnicity data were not available. Age, sex and urbanicity were determined for the month the claimant first met the study inclusion criteria.

Identification of Claimants with IDD. Primary and secondary diagnosis fields were used to identify IDD. Based on the most recent Centers for Medicare & Medicaid Services (CMS) Chronic Conditions Data Warehouse algorithms, ICD-9-CM codes for Intellectual Disabilities and Related Conditions were first selected (CMS, 2016). Next, additional codes for

developmental disabilities (i.e., Cerebral Palsy and Autism-Pervasive Developmental Disorders) were selected. This study replicated methods described in other recent work (e.g., McDermott, Royer, Cope, et al., 2018; Phillips, Houtenville, & Reichard, 2018) to apply diagnostic criteria for inclusion in the IDD group and assign claimants to mutually exclusive diagnostic subgroups. Inclusion criteria were met when an individual had at least one inpatient stay or at least two outpatient visits occurring at least 30 days apart with a diagnosis of IDD. Thirty days was selected in an effort to avoid inclusion in the IDD group on the basis of what could have been a single diagnostic event occurring across visits in a shorter interval. Finally, individuals who had diagnoses related to multiple diagnostic subgroups (e.g., Down syndrome and mild intellectual disability) were assigned to mutually exclusive groups. The diagnosis codes and mutually exclusive hierarchy are shown in Table 1.

Measures

Health care utilization. Medical visits were coded using the claim number, date of service, and billing provider fields. Multiple claims per encounter (based on the same facility and overlapping dates) were counted as a single visit. Then, inpatient hospitalizations were defined using the Healthcare Effectiveness Data and Information Set (HEDIS) definitions (National Committee for Quality Assurance, 2017) and examined separately for Medicaid and commercial claimants with and without IDD.

Ambulatory care sensitive conditions. The Agency for Healthcare Research and Quality's (AHRQ) Prevention Quality Indicators (PQI) for adults were used to define ACSC. Specifically, we started with used the 12 PQIs specific to adults and described in version 6 of the Technical Specifications for ICD-9-CM codes released in October 2016 (AHRQ, 2016). The PQIs indicate the proportion of individuals that were admitted to the hospital for a condition (i.e.,

the numerator), compared to the population of people who are at risk of this condition (i.e., the denominator). AHRQ specifications list ICD-9-CM codes to include and exclude as well as the age group to which the indicator applies. The common exclusions are cases transferred from other hospitals, skilled nursing, intermediate care and other health facilities, as well as cases missing data, or a diagnoses which indicates the admission was for an obstetric case. The list of 12 adult ACSC includes the following: diabetes short-term complications, diabetes long-term complications, uncontrolled diabetes, lower extremity amputation in patients with diabetes, perforated appendix, chronic obstructive pulmonary disease (COPD) or asthma in older adults ages 40 and up, asthma in younger adults ages 18 to 39, hypertension, heart failure, dehydration, bacterial pneumonia, and urinary tract infection.

Comorbid conditions. The Charlson Comorbidity Index (CCI) was used to control for underlying comorbidity (Charlson, Pompei, Ales, & MacKenzie, 1987). The index of 17 comorbid conditions has been widely used and validated across many disease and population groups (Austin, Wong, Uzzo, Beck, & Egleston, 2015; De Groot, Beckerman, Lankhorst, & Bouter, 2003; Luthi et al., 2007; Wei & Mukamal, 2018). Each beneficiary's CCI score was computed from non-laboratory diagnoses in Medicaid and commercial claims data using the enhanced ICD-9-CM coding methods described by Quan et al. (2005). Possible CCI scores range from 0 to 17, with zero indicating no comorbidities and higher numbers indicating more comorbid conditions.

Data Analyses

Descriptive statistics (frequencies, percentages, and ratios) were computed in Stata MP/13 to produce demographic characteristics of Medicaid- and commercially-insured beneficiaries with and without IDD, as well as the prevalence of ACSC, comorbid conditions,

and the number of hospitalizations overall and per person in each cohort. Logistic regressions controlling for age, gender, rural county, and comorbid conditions were used to produce odds ratios related to dichotomous outcomes (i.e., the odds that one group would have any versus no hospitalizations for a certain ACSC, compared to another group). Negative binomial count regressions controlling for age, gender, rural county, and comorbid conditions were used to assess statistically significant differences in the number of hospitalizations per person between groups. Negative binomial count regression uses a Gamma-Poisson distribution that approaches the Poisson distribution when counts are larger and has a larger variance when counts are low. Because sample sizes between beneficiaries with and without IDD differ substantially in this study's sample, the negative binomial count regression was deemed appropriate as a more flexible and conservative option than Poisson regression.

Results

During the 5-year study period, 31,030 adult Medicaid claimants and 242,674 adult commercial claimants met the inclusion criteria. Table 2 shows the demographic characteristics of the Medicaid and commercial claimants. In general, beneficiaries with IDD were younger than those without IDD, especially among the commercially-insured. In the Medicaid cohort, claimants with IDD were more likely to be male and to live in rural counties. Prevalence of the different types of IDD also varied by insurance type; compared to Medicaid claimants, commercial beneficiaries were more likely to have a specified condition such as Down syndrome and less likely to have a non-specific intellectual disability.

Prevalence of Ambulatory Care Sensitive Conditions

Table 3 summarizes the prevalence of ACSC among Medicaid and commercial beneficiaries with and without IDD. Due to small sample size, results of the 4 diabetes-related

indicators were grouped into "diabetes complications," and perforated appendix was collapsed into the "any ACSC" category. Among both Medicaid and commercial claimants, people with IDD were significantly more likely than people without IDD to have any ACSC and specifically to have heart failure, dehydration, bacterial pneumonia, and/or UTI. COPD or asthma in older adults was lower among beneficiaries with IDD, but only in the Medicaid group.

Prevalence of Comorbidities

Table 4 shows comorbidities, as measured by the Charlson Comorbidity Index (CCI), among claimants with and without IDD in the Medicaid and commercial cohorts. Beneficiaries with IDD experienced more comorbidities in general than beneficiaries without IDD, and regardless of IDD status, those with any ACSC had a higher mean CCI than the overall cohort in both insurance groups. In both the Medicaid and commercial cohorts, COPD or asthma in older adults, asthma in younger adults, and UTI were associated with more comorbidities among claimants with IDD. Compared to claimants without IDD, commercially-insured people with IDD had higher rates of comorbidity associated with diabetes complications, hypertension, and bacterial pneumonia, while Medicaid-insured beneficiaries with IDD experienced more comorbidities associated with heart failure or dehydration.

Inpatient Admissions for ACSC

Tables 5 and 6 show the percent of inpatient hospitalizations and the number of inpatient hospitalizations per person for ACSC among claimants with and without IDD who were Medicaid-insured or commercially-insured, respectively.

Medicaid beneficiaries. In the Medicaid cohort, 42% (n = 12,875) of claimants had at least one inpatient admission during the study period, and 10% (n = 3,027) had at least one admission for ACSC. Of the 1,704 Medicaid claimants with IDD, 883 had at least one inpatient

encounter during the study period, and 18% (n=311) had at least one inpatient encounter for ACSC. Among the Medicaid cohort without IDD, 9% (n = 2,716) were admitted to the hospital for ACSC.

Logistic regression controlling for age, gender, rural county, and comorbid conditions showed support for Hypothesis 1, revealing that Medicaid beneficiaries with IDD had 1.64 greater odds of being admitted to the hospital for ACSC than Medicaid beneficiaries without IDD. Specifically, claimants with IDD were more than twice as likely to be admitted for UTI, dehydration, or bacterial pneumonia; and they were significantly less likely to be admitted for diabetes complications or COPD or asthma in older adults.

Overall, Medicaid claimants with IDD had significantly fewer hospitalizations per person for ACSC than claimants without IDD according to negative binomial count model regressions controlling for age, gender, rural county, and comorbidities. Looking at specific ACSC, the per-person hospitalization rate was lower among Medicaid-insured beneficiaries with IDD for diabetes complications and dehydration; but the number of per-person admissions among beneficiaries with IDD was higher for UTI, bacterial pneumonia, and COPD or asthma in older adults.

Commercial beneficiaries. In the commercial cohort, 29% (n =69,964) of claimants had at least one inpatient admission during the study period, and 4% (n = 9,069) of the cohort had an admission for ACSC. Of the 822 commercial claimants with IDD, 398 had at least one inpatient encounter during the study period, and 9% (n=75) of these encounters were associated with ACSC. Among the commercial cohort without IDD, 4% (n = 8,994) were admitted to the hospital for ACSC.

Logistic regression controlling for age, gender, rural county, and comorbid conditions showed support for Hypothesis 2; commercially-insured beneficiaries with IDD had 1.63 greater odd of being admitted to the hospital for ACSC than commercial beneficiaries without IDD. Specifically, commercial claimants with IDD were more than three times more likely to be admitted for UTI and almost three times more likely to be admitted for hypertension. Negative binomial count model regressions, controlling for age, gender, rural county, and comorbidities further showed that among the commercially-insured, people with IDD had significantly more hospitalizations per-person for UTI than commercial beneficiaries without IDD.

These results also support Hypothesis 3 in that the patterns of hospitalization for ACSC among beneficiaries with IDD varied by insurance type. In the Medicaid cohort, beneficiaries with IDD had a higher prevalence of inpatient encounters and more inpatient encounters per person than those without IDD for diabetes complications, COPD or asthma in older adults, dehydration, and bacterial pneumonia. In the commercial cohort, beneficiaries with IDD had a higher prevalence of inpatient encounters for hypertension. Only for UTI was the prevalence of admission and the rate of per-person admission higher for people with IDD in the cohorts of both insurance types.

Discussion

Our study of inpatient hospitalizations for ambulatory care sensitive conditions (ACSC) among all-payer claimants with and without IDD yielded several important results. First, the prevalence of heart failure, dehydration, bacterial pneumonia, and UTI was higher among insurance beneficiaries with IDD than those without, regardless of insurance type (Medicaid or commercial). The prevalence of hypertension, asthma in younger adults (ages 18 to 39), and diabetes complications did not differ by IDD status or insurance cohort. The prevalence of

COPD or asthma in older adults (ages 40 and up) was lower among beneficiaries with IDD, but only in the Medicaid cohort.

Even when adjusting for the higher prevalence of comorbid conditions (as well as age, gender, and the rural or urban nature of the beneficiaries' residence), results showed that beneficiaries with IDD had more hospital admissions for ACSC than beneficiaries without IDD. Not only was the prevalence of hospital admissions higher, but also the number of hospitalizations per person was often greater than among beneficiaries without IDD. To some degree, the higher prevalence of hospital admissions among beneficiaries with IDD may be associated with more complex health needs compared to the general population. Yet, given the nature of ACSC and the Prevention Quality Indicators used here to operational them (AHRQ, 2016), this study's findings also suggest that more and/or better preventive care is warranted for people with IDD.

At the provider-level, strategies to improve access to high quality preventive health services may include systematic training of medical students and practicing health care providers to ensure cultural competence with IDD and improve understanding of IDD-specific health needs (Eddey & Robey, 2005; Ervin, Hennen, Merrick, & Morad, 2014). Providers can also help by better managing continuity of care and, when needed, accommodating longer appointment times for patients with IDD (Carey et al., 2017). In the community, individuals with IDD need sufficient supports to engage in healthy behaviors, consistently use prescribed medications, and comply with treatment plans (Meade et al., 2015).

Other findings from this study advance the idea that using all-payer claims data when possible provides a more thorough understanding of the health needs, health care status, and health care utilization of beneficiaries with IDD than examining Medicaid claims alone.

Although the prevalence of IDD among the Medicaid-insured population may be higher, the number of beneficiaries with IDD who can be identified within the commercially-insured population is substantial and has been shown to differ in meaningful ways (Phillips et al., 2018). The current investigation yielded similar results. For example, compared to beneficiaries without IDD, beneficiaries with IDD were more commonly hospitalized for dehydration and bacterial pneumonia in the Medicaid-insured cohort but not the commercially-insured group.

Even though beneficiaries with IDD in the commercially-insured group experienced more comorbidities associated with hypertension and bacterial pneumonia, hospital admissions were more likely for these conditions (and more frequent for bacterial pneumonia) among people with IDD in the Medicaid group. Prior work regarding differences in health equity among the publicly- versus privately-insured similarly underscores the importance of looking at both groups when considering potential quality of care markers (Alexander & Currie, 2017; Dresden, et al., 2016; Nguyen & Sommers, 2016). Indeed, the overall proportion of ACSC admissions in our analyses was lower in the commercially-insured group (4%) than the Medicaid group (10%), generally, and specifically among beneficiaries with IDD (9% in the commercial cohort compared to 18% in the Medicaid group).

Limitations

Several limitations of this study must be considered. First, some of the less prevalent ACSC could not be considered separately due to small sample size, despite using five years of pooled data. Moreover, administrative claims data are known to underrepresent certain populations, as they may miss individuals with milder impairments who have not yet been diagnosed, and they do not include people who are uninsured. Specifically in our state, Medicaid data for eight months of 2013 (April through November) were unavailable from the state's

records and therefore not included in the data set. Given this and in order to maintain congruence and validity of comparisons, we elected to suppress the same months' of data from the commercial claims.

Other limitations include the fact that the analyses did not control for continuity of health care, which could be affected by lapses in insurance coverage, individual behaviors, and/or access to routine, primary care. Information about the beneficiaries' living arrangements was also not available. It is possible that among beneficiaries with IDD, both access to care and compliance with primary care treatment plans could differ among individuals living on their own, with family members, or in group housing situations. Similarly, this study could not account for differences in social support and did not investigate the possible implications of disability severity. As previously noted, these data also lack reliable information about the race and ethnicity of the insurance beneficiaries. Finally, underlying differences in health between beneficiaries with and without IDD and/or beneficiaries of public versus private insurance may exist beyond what was captured in our study with the Charlson Comorbidity Index.

Conclusion

This study indicates that hospitalization for ACSC is common among both Medicaid- and commercially-insured groups and that beneficiaries with IDD are significantly more likely to be hospitalized for potentially preventable conditions, regardless of insurance type, than beneficiaries without IDD. This suggests an ongoing need for high quality preventive health care services for people with IDD. Routine primary care and comprehensive health assessments improve health outcomes (Agarwal, Jain, Ghosh, & Parihar, 2017). The disparities described in this study highlight opportunities to advance health equity for insurance beneficiaries with IDD. At the same time, health care expenditures can be positively impacted (Armour et al., 2009) by

reducing avoidable hospitalizations for certain ACSC. These results further underscore the idea that the prevention and management of ACSC constitute “major avenues for improving health of people with intellectual disabilities across their life course” (Krahn & Fox, 2014, p. 438).

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Table 1

Diagnoses Used to Identify IDD and Hierarchy of Mutually Exclusive IDD Groups

Diagnosis	ICD-9-CM Codes	Hierarchy
Down syndrome and other chromosomal, autosomal, or congenital conditions[a] (i.e., Patau's syndrome, Edwards' syndrome, cri-du-chat syndrome, velo-cardio-facial syndrome, other microdeletions, other autosomal deletions, other conditions due to autosomal anomalies, multiple congenital anomalies, Prader-Willi syndrome, Fragile X syndrome, & other specified congenital anomalies, fetal alcohol syndrome)[a]	758, 758.0, 758.1, 758.2, 758.3, 758.31, 758.32, 758.33, 758.39, 758.5, 759.7, 759.81, 759.83, 759.89, 760.71	1
Cerebral Palsy[b]	333.71, 343, 343.0, 343.1, 343.2, 343.3, 343.4, 343.8, 343.9	2

Autism Spectrum Disorders[c]	299.0, 299.00, 299.01, 299.1, 299.11, 299.8, 299.80, 299.81, 299.9, 299.90, 299.91	3
Mild intellectual disabilities[a]	317	4
Moderate, severe, or profound intellectual disabilities[a]	318, 318.0, 318.1, 318.2	5
Unspecified intellectual disabilities[a]	319	6

Notes. IDD = intellectual or developmental disability

[a] From Chronic Conditions Warehouse (CCW) algorithm to identify Intellectual Disabilities and Related Conditions; [b] From CCW algorithm to identify Autism Spectrum Disorder; [c] From CCW algorithm to identify Cerebral Palsy

Table 2

Sample Characteristics: Adults Ages 18 to 64 with and without IDD by Insurance Type

	Medicaid				Commercial			
	IDD		no IDD		IDD		no IDD	
	n	%	n	%	n	%	n	%
Total	1,704	100%	29,526	100%	822	100%	241,852	100%
Age								
18-29	629	37%	9,464	32%	278	34%	55,267	23%
30-39	332	19%	6,686	23%	164	20%	46,418	19%
40-49	317	19%	6,410	22%	153	19%	57,624	24%
50-64	425	25%	6,962	24%	227	28%	82,543	34%
Gender								
Female	801	47%	20,340	69%	445	54%	131,811	55%
Male	902	53%	9,182	31%	377	46%	110,041	45%
Geography								

Urban	817	48%	16,513	56%	503	61%	146,855	61%
Rural	886	52%	13,009	44%	319	39%	94,997	39%
IDD type								
Down/OCC	306	18%			394	48%		
Cerebral Palsy	369	22%			180	22%		
Autism	388	23%			183	22%		
Mild ID	429	25%			27	3%		
Moderate ID	106	6%			15	2%		
Unspecified ID	105	6%			23	3%		

Notes. Down/OCC = Down syndrome or other chromosomal, autosomal, or congenital conditions; ID = intellectual disability

Table 3

Prevalence of Ambulatory Care Sensitive Conditions among Adults with and without IDD by Insurance Type

	Medicaid						Commercial					
	IDD		No IDD				IDD		No IDD			
	n	%	n	%	χ^2		n	%	n	%	χ^2	
Total	1,704	100.0	29,526	100.0	--		822	100.0	241,852	100.0	--	
Any ACSC[a]	937	55.0	14,755	50.0	16.1	***	373	60.1	97,845	40.0	19.5	***
Diabetes complications[b]	157	9.2	2,910	9.9	0.8		43	5.2	13,760	5.7	0.32	
COPD or asthma in older adults[c]	209	23.8	5,066	31.5	22.8	***	61	16.1	18,178	13.0	3.2	
Asthma in younger adults[d]	116	12.1	1,678	10.4	1.7		36	8.1	8,137	8.0	0.01	
Hypertension	243	14.3	4,517	15.3	1.3		142	17.3	40,641	16.8	0.1	
Heart Failure	91	5.3	1,015	3.4	17.1	***	21	2.6	3,735	1.5	5.5	*
Dehydration	92	5.4	853	2.9	34.6	***	35	4.3	3,959	1.6	34.8	***

Pneumonia	292	17.1	2,625	8.9	129.4	***	67	8.2	12,217	5.1	16.4	***
UTI	368	21.6	5,088	17.2	21.3	***	150	18.3	31,250	12.9	20.6	***

Notes. ACSC = ambulatory care sensitive condition; COPD = chronic obstructive pulmonary disease; UTI = Urinary tract infection

[a] Any ACSC includes all conditions listed by row as well as perforated appendix, which was suppressed due to small sample size; [b] Diabetes complications includes short- and long-term complications, uncontrolled diabetes, and lower extremity amputations in patients with diabetes; [c] Denominator is adults ages 40 and up; [d] Denominator is adults ages 18 to 39

*p < 0.05; ***p < 0.001

Table 4

Charlson Comorbidity Index Scores of Adults with ACSC among Adults with and without IDD by Insurance Type

	Medicaid					Commercial				
	IDD		No IDD			IDD		No IDD		
	mean	(SD)	mean	(SD)	*z*	mean	(SD)	mean	(SD)	*z*
Total	2.4	(2.5)	1.8	(2.5)	-13.4 ***	1.8	(2.3)	1.0	(1.8)	-13.1 ***
Any ACSC[a]	3.3	(2.6)	2.9	(2.9)	-8.8 ***	2.3	(2.6)	1.5	(2.2)	-8.7 ***
Diabetes complications[b]	5.5	(2.8)	5.4	(3.4)	-1.0	5.5	(3.1)	3.8	(2.8)	-4.0 ***
COPD or asthma in older adults[c]	4.9	(2.8)	4.2	(3.2)	-4.7 ***	4.3	(3.2)	2.7	(2.5)	-4.6 ***
Asthma in younger adults[d]	2.7	(1.9)	1.9	(1.5)	-6.6 ***	2.7	(1.8)	1.3	(0.9)	-7.2 ***
Hypertension	3.7	(2.9)	3.6	(3.2)	-1.4	3.1	(2.7)	1.9	(2.4)	-6.8 ***
Heart Failure	5.4	(3.0)	6.5	(3.5)	2.9 **	5.1	(3.2)	4.8	(3.5)	-0.6

Dehydration	4.6	(3.2)	4.1	(3.8)	-2.3	*	2.6	(2.7)	3.0	(3.8)	0.3	
Pneumonia	3.7	(2.9)	3.8	(3.4)	-1.3		3.6	(2.9)	2.3	(2.9)	-5.5	***
UTI	3.4	(2.7)	2.4	(2.8)	-9.3	***	2.4	(3.0)	1.4	(2.1)	-5.4	***

Notes. SD = standard deviation; *z* statistic from Wilcoxon rank sum test

[a] Any ACSC includes all conditions listed by row as well as perforated appendix, which was suppressed due to small sample size; [b] Diabetes complications includes short- and long-term complications, uncontrolled diabetes, and lower extremity amputations in patients with diabetes; [c] Denominator is adults ages 40 and up; [d] Denominator is adults ages 18 to 39

*p < 0.05; **p < 0.01; ***p < 0.001

Table 5

Prevalence of Inpatient Encounters and Number of Inpatient Encounters per Person for ACSC among Medicaid-Insured Adults with and without IDD

	Adults with ≥ 1 inpatient encounter						Number of inpatient encounters					
	IDD		No IDD				Overall		Per person			
	n	%	n	%	OR		IDD	No IDD	IDD	No IDD	β	
Total	883	100	11,992	100			1,881	22,969	2.13	1.92		
Any ACSC[a]	311	35.2	2,716	22.6	1.64	***	477	4,866	1.53	1.79	-0.12	*
Diabetes complications[b]	31	3.5	534	4.5	0.68	*	41	1,000	1.32	1.87	-0.48	*
COPD or asthma in older adults[c]	30	5.5	886	14.1	0.36	***	56	1,595	1.87	1.80	-0.83	***
Hypertension	19	2.2	260	2.2	0.91		24	309	1.26	1.20	-0.33	
Heart failure	37	4.2	355	3.0	1.37		44	541	1.19	1.52	0.05	
Dehydration	28	3.2	154	1.3	2.45	***	29	176	1.04	1.14	0.45	*

Pneumonia	163	18.5	936	7.8	2.38	***	223	1,217	1.37	1.30	0.48	***
UTI	69	7.8	356	3.0	2.80	***	99	437	1.43	1.23	0.70	***

Notes. Odds ratios (OR) from logistic regression and beta coefficients (β) from negative binomial count model regressions included controls for age, gender, rural county, and comorbidities

[a] Any ACSC includes all conditions listed by row as well as perforated appendix and asthma in younger adults, which were suppressed due to small sample size; [b] Diabetes complications includes short- and long-term complications, uncontrolled diabetes, and lower extremity amputations in patients with diabetes; [c] Denominator is adults ages 40 and up

*p < 0.05; ***p < 0.001

Table 6

Prevalence of Inpatient Encounters and Number of Inpatient Encounters per Person for ACSC among Commercially-Insured Adults with and without IDD

	Adults with ≥ 1 inpatient encounter						Number of inpatient encounters				
	IDD		No IDD				Overall		Per person		
	n	%	n	%	OR		IDD	No IDD	IDD	No IDD	β
Total	398		69,566				834	113,609	2.10	1.63	
Any ACSC[a]	75	18.8	8,994	12.9	1.63	***	110	12,609	1.45	1.40	0.06
Diabetes complications[b]	7	1.8	1,453	2.1	0.68		8	2,099	1.14	1.44	-0.63
Hypertension	18	4.5	1,300	1.9	2.72	***	18	1,454	1.00	1.12	0.47
Heart failure	11	2.8	1,200	1.7	1.63		19	1,692	1.73	1.41	0.40
Pneumonia	20	5.0	2,404	3.5	1.55		23	2,890	1.15	1.20	0.00
UTI	17	4.3	866	1.2	3.54	***	24	1,008	1.41	1.16	0.99 **

Note. Odds ratios (OR) from logistic regression and beta coefficients (β) from negative binomial count model regressions included controls for age, gender, rural county, and comorbidities

[a] Any ACSC includes all conditions listed by row as well as perforated appendix, asthma or COPD in older adults, asthma in younger adults, and dehydration, which were suppressed due to small sample size; [b] Diabetes complications includes short- and long-term complications, uncontrolled diabetes, and lower extremity amputations in patients with diabetes

**p < 0.01; ***p < 0.001