NBER RDRC Report

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NB #22-14: Identifying Trends and Racial/Ethnic Disparities in Healthcare Utilization, Access, and Health Outcomes Among SSI Recipients

We have two overarching goals in this report. The first goal is to document differences in health care utilization and health outcomes by race and ethnicity among people with disabilities who receive Supplemental Security Income (SSI). The second goal is to compare health care utilization and outcomes in the SSI population to (a) Medicaid enrollees with disabilities who do not qualify for SSI (e.g., those who respond affirmatively to at least one of six questions related to cognitive or mobility impairments, but are not enrolled in SSI) and (b) Medicaid enrollees without disabilities. Unless otherwise stated, we use nationwide 100% samples of Medicaid Transformed Analytic Files (TAF) in 2018-2019 to measure health care utilization and outcomes for these populations.¹ We focus on adults ages 18-64.

We have three specific aims:

- 1. Document trends and disparities in the use of primary and specialty care and access to care.
- 2. Characterize the types of providers who deliver care, as well as the sites and locations in which Medicaid enrollees receive care.
- 3. Document disparities in health outcomes by evaluating differences in the prevalence of adverse health events between populations.

Results for each aim appear in the subsections below. Within each aim, we make comparisons between (i) adult white SSI recipients v. adult racial/ethnic minority SSI recipients, as well as (ii) adults SSI recipients v. adult Medicaid enrollees with disabilities who do not qualify for SSI v. adult Medicaid enrollees without disabilities. The general structure of the results is to first present unadjusted differences in health care utilization and outcomes across groups. Then we present adjusted differences, estimated using Ordinary Least Squares (OLS) regression techniques, where we control for recipient characteristics, state-of-residence, and calendar year.

 $^{^{1}}$ We exclude data from states where SSI recipients do not automatically qualify for Medicaid. These states are known as "209(b) states." We must drop 209(b) states because we cannot accurately identify SSI recipients in the Medicaid TAF data in these states. 209(b) states include Connecticut, Hawaii, Illinois, Minnesota, Missouri, New Hampshire, North Dakota, Oklahoma, and Virginia.

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Equation 1 shows how we model differences in health care utilization and outcomes by recipient race and ethnicity within the adult SSI population:

$$y_{ist} = \beta_0 + \beta_1 Black_i + \beta_2 Hisp_i + \beta_3 Other_i + \beta_4 female_i + \mathbf{\Omega} \mathbf{X}_{it} + \lambda_t + \delta_s + \varepsilon_{ist} \tag{1}$$

where *i* indexes the adult SSI recipient living in state *s* in year $t \in (2018, 2019)$. *Black_i*, *Hisp_i*, and *Other_i* are indicators for race/ethnicity, whose associated coefficients are interpreted relative to the omitted category of non-Hispanic *White_i*; *female_i* is an indicator for the recipient's biological sex listed as female; X_{it} is a vector of time-varying recipient-level controls: age, age-squared, an indicator for urban county of residence, and an indicator for having any chronic condition (among 27 possible conditions). λ_t are year fixed effects and δ_s are recipient state-of-residence fixed effects.

Equation 2 includes the same outcomes (y_{ist}) as equation 1, except now we compare health care utilization and outcomes for adult SSI recipients to (a) adults with disabilities who are enrolled in Medicaid, but who do not receive SSI and to (b) adults without disabilities who are enrolled Medicaid (omitted category). Specifically, we estimate:

$$y_{ist} = \alpha_0 + \alpha_1 SSI_{it} + \alpha_2 Disabled_nonSSI_{it} + \alpha_3 female_i + \Omega X_{it} + \lambda_t + \delta_s + \varepsilon_{ist}$$
(2)

where α_1 shows how outcomes for SSI recipients compare to outcomes for non-disabled, adult Medicaid enrollees (omitted category). α_2 shows how outcomes for disabled adults who do not qualify SSI compare to outcomes for non-disabled, adult Medicaid enrollees. To compare differences in outcomes between disabled adults with and without SSI, we subtract α_2 from α_1 . $female_i$, \mathbf{X}_{it} , λ_t , and δ_s are defined as in Equation 1.

Results Preview: In general, we have two main findings. First, we find that White SSI recipients are in worse health than Black and Hispanic SSI recipients; however, White SSI recipients have better access to primary care than racial/ethnic minorities in SSI, especially compared to Black SSI recipients. As a result, Black SSI recipients have higher rates of emergency health care utilization. In future work, we are exploring why access to primary care is worse for racial/ethnic minorities in SSI. Second, we find that SSI-receiving adults with disabilities are in worse health than non-SSI-receiving adults with disabilities are in worse health than non-SSI-receiving adults with disabilities. For example, disabled adults on SSI are two times as likely to die in a given year compared to disabled adults not on SSI. They also have 2.5 times as many chronic conditions, and have higher rates of emergency health care utilization. In future work, we hope to redefine our sample of adults with disabilities who are not on SSI to include adults receiving Social Security Disability Insurance (SSDI) benefits, and to draw comparisons across SSI and SSDI recipients in Medicaid.

1.1 Documenting Utilization and Access Trends

This aim focuses on measuring access to primary care services in the Medicaid claims data. As part of the Medicaid Data Initiative, spearheaded by the NBER Retirement and Disability Research Center (RDRC) and the Social Security Administration (SSA), our team helped to purchase TAF demographic & enrollment (DE) files 2018-19, TAF inpatient (IP) files 2018-19, TAF other services (OT) files 2018-19, TAF prescription drug (RX) files 2018-19, and TAF long-term care (LT) files 2018-19. The TAF DE and OT files are the most important files for measuring access to primary care. We start by defining our populations (e.g., SSI adults) using the DE files. We then merge those cohorts to their medical claims in the TAF OT files. Within the TAF OT files, we define "primary care visits" using diagnosis codes that flag Current Procedural Terminology (CPT) Evaluation & Management ("E&M") visits. Table 1 shows the CPT codes that we use to identify these visits. In general, an evaluation and management visit occurs when a health care provider discusses medical needs, conditions, and procedures with a patient in an outpatient setting. There are separate codes for new patient visits vs. established patient visits.

Table 1: Evaluation & Management (E&M) CPT Codes

CPT Codes	Description
99201 - 99205	New patient office visit
99211 - 99215	Established patient office visit

1.1.1 Racial/Ethnic Differences in SSI

Table 2 shows the breakdown of E&M visit types by race and ethnicity among adult SSI recipients. We report counts (in thousands) as well as the overall percentage of visits for each type. For example, there are $1,072.36 \times 1,000 = 1,072,360$ outpatient claims for new patient visits for White SSI recipients in 2018-19. There are 11,663,200 claims for established patient visits for White SSI recipients in 2018-19. There are fewer claims for Black and Hispanic recipients because these populations are smaller. In general, we find the share of SSI recipients without an E&M visit is largest among Hispanic recipients (37%), followed by Black recipients (34%), and then White recipients (33%). This is suggestive evidence that White SSI recipients may have better access to primary care than Hispanic and Black SSI recipients, though we explore this hypothesis is greater detail in subsequent sections.

Table 2 also shows unadjusted differences in the severity of E&M visits by race/ethnicity. For example, it shows the percentage of E&M claims by severity type category, 1–5, where 1=least complex patient visit and 5=most complex patient visit. In general, these codes correspond to the time a provider spends with the patient (i.e., 5=the most time). Therefore, we use these codes to measure provider resources spent on the patient. In these unadjusted results, we do not find very significant differences in severity codes across SSI recipients of different races/ethnicities.

	Whi	te	Blac	ck	Hispa	nic
	Ν	pct	Ν	pct	Ν	pct
New Patient						
1	35.96	0.28	17.65	0.25	17.33	0.46
2	97.82	0.77	62.84	0.88	32.36	0.86
3	433.39	3.40	257.15	3.62	138.68	3.67
4	399.25	3.13	230.26	3.24	123.87	3.28
5	105.934	0.83	59.72	0.84	30.04	0.80
Total	1072.36	8.42	627.62	8.84	342.28	9.06
Established Patient						
1	531.42	4.17	292.46	4.12	154.33	4.09
2	600.748	4.72	411.04	5.79	223.01	5.91
3	5276.18	41.43	2904.08	40.89	1636.81	43.35
4	4802.92	37.71	2592.63	36.50	1276.15	33.80
5	451.92	3.55	274.59	3.87	143.49	3.80
Total	11663.2	91.58	6474.80	91.16	3433.80	90.94
Share w/ No E&M Visit	0.33		0.34		0.37	

Table 2: E&M Severity by Race/Ethnicity in the SSI Population

This table reports the types of E&M visits by race/ethnicity of SSI recipients. Data is sourced from TAF 2018-2019. E&M visits are identified among White, Black, and Hispanic SSI recipients aged 18-64 years who do not live in a 209b state or Oregon. Counts are reported as thousands of E&M visits. Visit types are measured by the CPT code on the E&M visit, with 1 being the least resource intensive visit, and 5 being the most resource intensive. The "Total" row reports the total number of new patient or established patient E&M visits of a given race.

Next we consider our adjusted results, presented in Table 3. These results show how primary care access and patient severity differs for Black, Hispanic, and Other race/ethnicity SSI recipients compared to White. We find that Black SSI recipients are 11% (= $\frac{0.0359}{0.34} \times 100\%$) more likely to have no E&M visit compared to White recipients. We also find that, among Black recipients with at least two E&M visits, the average time between their visits is 6.4 days longer than the average time between White recipient visits, and the likelihood their visit is labeled "complex (code 4 or 5)" is 2.7% (= $\frac{-0.0236}{0.85} \times 100\%$) lower. These results could be interpreted in at least one of two ways: either Black SSI recipients are in better health than White SSI recipients, which means they have less complex visits and require fewer frequent visits; or that Black SSI recipients have more access to primary care than White SSI recipients, given that they are more likely to have no E&M visit whatsoever; or a combination of both. Given that SSI recipients have chronic disabling conditions (which should require at least some primary care attention each year), we think the results likely reflect a combination of both explanations. We develop these ideas further in Sections 1.2 and 1.3.

The results for "Other" race/ethnicity SSI recipients compared to White are similar to those for Black SSI recipients compared to White. The "Other" group largely comprises Asian, American Indian and Alaskan Native, and mixed race recipients. This group is more likely to have no E&M visit, longer duration between E&M visits, and less complex E&M visits compared to White SSI recipients.

The results for SSI recipients of Hispanic ethnicity are somewhat different. Hispanic SSI recipients are more likely to have at least one E&M visit compared to White recipients, with no difference in average duration between visits. Like Black and Hispanic recipients, however, they have less complex visits.

	(1)	(2)	(3)
	Share w/ No E&M Visits	Avg Time Between Visits	Share w/ Severe E&M Visits
Black	0.0359^{***}	6.373***	-0.0236***
	(0.000467)	(0.127)	(0.000478)
Hispanic	-0.0170***	0.180	-0.0174***
	(0.000596)	(0.160)	(0.000675)
Other	0.00770***	7.435***	-0.0615***
	(0.000966)	(0.255)	(0.00114)
Observations	4509889	2209103	2209103
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Mean	0.34	75.83	0.85
*	0.01 *** 0.001		

Table 3: E&M Visit Characteristics of SSI Recipients by Race/Ethnicity

This table depicts estimates from three regression models where the outcomes relate to primary care access, as measured by E&M visits. Data is obtained from TAF for 2018-2019. Outcomes include average time between E&M visits, the share of recipients with no reported E&M visits, and the share with severe E&M visits. Columns 2 and 3 are limited to a sample of SSI recipients who reported more than 1 office E&M visit 2018-2019, while Column 1 includes all SSI recipients regardless of E&M visit status. All columns are at the recipient level. The sample is restricted to SSI recipients aged 18-64 years for all models, and recipients residing in 209b states or Oregon are removed from the sample. Controls for gender, age, chronic condition status, urban county residence, and state and year fixed effects are included in all specifications.

1.1.2 Differences by Medicaid Enrollee Type

To complete Section 1.1, we now compare E&M visits and severity across three groups of adult Medicaid enrollees: (1) adults with disabilities on SSI, (2) adults with disabilities who are not on SSI, and (3) adults without disabilities. Table 4 shows our unadjusted results. First, we note that the sample of adults without disabilities is at least seven times as large as the sample of adults with disabilities who are on SSI. Then the sample of adults with disabilities on SSI is about 2.5 times as large as the sample of adults with disabilities who are not on SSI. Second, we find that about 33% of SSI adults do not have a single E&M claim each year, and this percentage is comparable to non-SSI disabled adults (34%), but is much lower than the percentage for non-disabled adults (54%). These results seem consistent with the hypothesis that non-disabled adults have less complex health care needs, on average, than adults with disabilities.

	SSI Enro	ollees	Non-SSI	Disabled	All Other	Enrollees
	Ν	pct	Ν	pct	Ν	pct
New Patient						
1	72.63	0.30	21.18	0.22	529.22	0.50
2	197.27	0.82	123.76	1.28	1733.57	1.63
3	846.74	3.50	482.63	5.00	6117.02	5.76
4	767.96	3.17	318.64	3.30	4294.74	4.04
5	197.72	0.82	73.54	0.76	900.75	0.85
Total	2082.31	8.61	1019.74	10.57	13575.3	12.78
Established Patient						
1	1001.82	4.14	250.04	2.59	3429.96	3.23
2	1269.50	5.25	568.36	5.89	7085.77	6.67
3	10115.12	41.81	4460.48	46.22	48713.85	45.86
4	8845.34	36.57	3090.95	32.03	30754.78	28.96
5	876.10	3.62	260.49	2.70	2654.34	2.50
Total	22107.88	91.39	8630.33	89.43	92638.7	87.22
Share w/ No E&M Visit	0.33		0.34		0.54	

Table 4: E&M Severity by Medicaid Enrollee Type

This table reports the characteristics of E&M visits by enrollee type among Medicaid beneficiaries. Data is sourced from TAF 2018-2019. E&M visits are identified for Medicaid recipients 18-64 years old who do not reside in 209b states or Oregon. Recipients are considered disabled if they report one of 6 physical or intellectual limitations. Counts are reported as thousands of E&M visits. Visit level is measured by the CPT code of a given E&M visit, with 1 being the least resource intensive visit, and 5 being the most resource intensive. The "Total" row reports the total number of new patient or established patient E&M visits of a given enrollee type.

Table 5 recreates Table 3, but makes comparisons across groups of adults with and without disabilities, rather than across racial/ethnic groups within the SSI population. We find that adults without disabilities are more likely to have zero E&M claims compared to adults with disabilities (both on SSI and not) (column 1). Conditional on having some E&M visits, adults without disabilities have less severe E&M visits compared to adults with disabilities (column 3). However, the time between E&M visits varies across these groups. SSI recipients have, on average, 1.25 days longer duration between E&M visits compared to adults without disabilities, while non-SSI adults with disabilities have 2.6 days less duration between E&M visits (column 2). This result likely reflects the fact that adults without disabilities, requiring more frequent visits.

	(1)	(2)	(3)
	Share w/ No E&M Visits	Avg Time Between Visits	Share w/ Severe E&M Visits
SSI Recipients	-0.0805***	1.250***	0.0538***
	(0.000223)	(0.0611)	(0.000247)
Non-SSI Disabled	-0.0508***	-2.600***	0.0313***
	(0.000385)	(0.113)	(0.000424)
Observations	52643868	16162236	16162236
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Mean	0.52	84.19	0.73

Table 5: E&M Visit Characteristics of SSI Recipients by Enrollee Type

This table depicts estimates from three regression models where the outcomes relate to primary care access, as measured by E&M visits. Data is obtained from TAF for 2018-2019. Outcomes include average time between E&M visits, the share of recipients with no reported E&M visits, and the share with severe E&M visits. Columns 2 and 3 are limited to a sample of adult Medicaid recipients who reported more than 1 office E&M visit 2018-2019, while Column 1 includes all Medicaid recipients regardless of E&M visit status. All columns are at the recipient level. The sample is restricted to Medicaid recipients aged 18-64 years for all models, and recipients residing in 209b states or Oregon are removed from the sample. Controls for gender, age, chronic condition status, urban county residence, and state and year fixed effects are included in all specifications.

1.2 Characterizing Provider Types

The goal of this aim is to document differences in where adults on Medicaid receive primary care. Our outcomes include sites of care (e.g., physician's office, Federally Qualified Health Centers (FQHCs), other clinics, hospital outpatient centers, and other places of service) and information about the individual health care providers who treat these patients (e.g., physician vs. nurse practitioner and physician assistant, as well as provider gender, specialty, and experience). To obtain information about individual provider characteristics, we link the "service provider ID" on the E&M claims (in the TAF OT files) with the National Plan and Provider Enumeration System (NPPES) registry and the Doctors and Clinicians (DAC) national downloadable file.

1.2.1 Racial/Ethnic Differences in SSI

Our unadjusted results, where we compare sites of care and provider characteristics by race/ethnicity in the SSI population, appear in Table 6. The top panel of Table 6 shows that White SSI recipients are more likely to receive primary care in a physician's office (71% of visits) compared to Black SSI recipients (68%) and Hispanic SSI recipients (70%). Black and Hispanic SSI recipients are more likely to receive primary care in hospital outpatient centers (13% and 12% vs. 10%, respectively). The bottom panel of Table 6 restricts the sample to primary care visits that occur in physicians' offices, and shows how individual provider characteristics vary by SSI recipient race/ethnicity. We find that White SSI recipients are more likely to receive care from Nurse Practitioners or Physician Assistants (20% of visits) vs. physicians, compared to Black and Hispanic SSI recipients (16% and 12% of visits). We also find that White SSI recipients are less likely to receive care from very experienced providers (avg experience = 21.6 years) compared to Black and Hispanic SSI recipients, who receive care from providers with 22.6 and 23.9 years of experience, respectively. However, the top three specialties of primary care providers are consistent across White, Black, and Hispanic SSI recipients (Internal Medicine, then Family Medicine,

then Psychiatry & Neurology).

	White	Black	Hispanic
	Mean	Mean	Mean
Place of Service			
Share physician's office	0.71	0.68	0.70
Share FQHC	0.04	0.05	0.04
Share Clinic	0.07	0.05	0.08
Share Outpatient Hospital	0.10	0.13	0.12
Other Place of Service	0.08	0.08	0.06
N	12735553	7102419	3776079
Provider Characteristics			
Share male	0.62	0.61	0.66
Average experience (years)	21.58	22.61	23.90
SD	12.36	12.52	12.41
Degree			
Physician	0.80	0.84	0.88
Nurse Practitioner or Physician Assistant	0.20	0.16	0.12
Top 3 Most Common Specialties			
1	Internal Medicine	Internal Medicine	Internal Medicine
2	Family Medicine	Family Medicine	Family Medicine
3	Psychiatry & Neurology	Psychiatry & Neurology	Psychiatry & Neurology
N	7472039	3947429	2184175

Table 6: Provider and Place of Service Characteristics by Race/Ethnicity in SSI

This table depicts place and provider characteristics of all E&M visits reported by SSI recipients in 2018-2019 by race. The share of all E&M visits a patient has in a given year in a particular place of service are reported under Place of Service. Provider characteristics are reported for physicians (MD/DO) and advanced practice providers (APP) treating SSI recipients in an office E&M setting. E&M visits of SSI recipients are identified using TAF 2018-2019. The sample includes all visits for recipients aged 18-64 years who do not reside in a 209b state or Oregon. Year of graduation from medical school is obtained from the Doctors and Clinicians national downloadable file from CMS. Degree and specialty information is obtained from the NPPES. Of the providers observed treating SSI-receiving Medicaid enrollees, 70% have a non-missing year of graduation.

To more directly measure access to primary care, we construct ratios of primary care providers (PCPs) to patients at the county-level. Specifically, we count the number of unique individual providers who provide E&M care to SSI recipients in county i; then we divide that number by the total number of SSI recipients in county i. Figure 1 plots these unadjusted ratios by SSI recipient race and ethnicity. If the ratios differ by race/ethnicity, then it shows that SSI recipients of different races/ethnicities live in counties with different levels of PCP participation in Medicaid. Higher ratios correspond to greater PCP participation. We find that White SSI recipients live in counties with higher average PCP-topatient ratios (0.5 PCPs per patient) compared to Black (0.38 PCPs per patient), Hispanic (0.3 PCPs per patient), and Other SSI recipients (0.4 PCPs per patient).



Figure 1: Ratio of All Providers to Patients by Race

This figure depicts the ratio of all providers to SSI recipients by race. Ratios are calculated by dividing the count of providers who treat SSI recipients within a given county by the total number of SSI recipients within that county. Recipients and E&M visits are identified using the TAF 2018-2019. Providers are identified using the TAF and NPPES. The sample of SSI recipients is restricted to those aged 18-64. Recipients who reside in a 209b state or Oregon are removed from the sample.

Next we show how sites of care and provider participation differ by race/ethnicity after adjusting for recipient demographics and state-of-residence. Table 7 shows that White SSI recipients are (i) more likely to receive primary care in a physician's office compared to all other racial/ethnic groups (Black, Hispanic, Other), (ii) less likely to receive primary care in a clinic compared to all other racial/ethnic groups, (iii) are more likely to receive care from a physician (instead of a nurse or physician's assistant) compared to all other racial/ethnic groups, and (iv) are more likely to live in counties with higher levels of PCP participation per patient compared to all other racial/ethnic groups. Overall, the results of this section, in conjunction with our results in Section 1.1, suggest that racial/ethnic minorities, especially Black SSI recipients, have less consistent access to primary care (especially physicians) than White SSI recipients. In Section 1.3, we explore how reduced primary care access for racial/ethnic minorities correlates with rates of emergency health care utilization (i.e., emergency department visits and hospitalizations).

	(1)	(2)	(3)	(4)
	Share in Office	Share in Clinic	Share w/ Physician in Office	Provider-to-Patient Ratio
Black	-0.0476***	0.00951^{***}	-0.00786***	-0.0766***
	(0.000170)	(0.000108)	(0.000187)	(0.000257)
Hispanic	-0.0294***	0.00839***	-0.00881***	-0.0482***
	(0.000219)	(0.000146)	(0.000227)	(0.000314)
Other	-0.0675***	-0.00529***	-0.0124***	-0.0542***
	(0.000563)	(0.000322)	(0.000644)	(0.000972)
Observations	24663864	24663864	14239458	2993336
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Mean	0.70	0.11	.60	0.42

Table 7: Provider and Place of Service Characteristics of E&M Visits by Race/Ethnicity

This table depicts a regression of provider and place-of-service-related outcomes on race indicators among SSI recipients. Data is obtained from TAF for 2018-2019. Outcomes include share of a recipient's visits occurring in a physician's office, the share of a recipient's visits occurring in a clinic or FQHC, the share of a recipient's office visits with a physician, and the ratio of providers (MD/DOs and APPs) to SSI recipients in each recipient's county. The sample is restricted to SSI recipients aged 18-64 years for all models, and recipients residing in 209b states or Oregon are removed from the sample. Controls for gender, age, chronic condition status, urban county residence, and state and year fixed effects are included in all specifications. Columns 1-3 are at the visit level, while Column 4 is at the recipient level. Column 3 is additionally restricted to visits that occurred in an office setting.

1.2.2 Differences by Medicaid Enrollee Type

Next we show how sites-of-care and provider characteristics differ across adult populations in Medicaid. Table 8 shows our unadjusted estimates. Perhaps the most surprising result is that disabled adults without SSI receive primary care in different settings and from different providers, compared to disabled adults with SSI and non-disabled adults. Adults with disabilities not on SSI receive less primary care in physicians' offices compared to adults with disabilities on SSI (61% vs. 70% of claims), more care at FQHCs (8% vs. 4% of claims), more care in hospital outpatient centers (15% vs. 11% of claims), and more care in other places of service (10% vs. 8% of claims). However, adults with disabilities on SSI receive care in similar places compared to adults without disabilities.

Looking at differences in the individual providers who treat these populations yields similar results. Adults with disabilities who are not on SSI receive less care from physicians compared to adults with disabilities on SSI (74% vs. 83% of claims), receive care from fewer male providers (54% vs. 62% of claims), and receive care from less experienced providers (avg experience is 19.5 years vs. 22.3 years). Nevertheless, Figure 2 shows they are more likely to live in counties with greater provider participation (e.g., higher provider-to-patient ratios).

	CCI Ennelleer	New CCI Disabled	All Other Ennelless
	351 Enronees	non-oor Disabled	An Other Enrollees
	Mean	Mean	Mean
Place of Service			
Share physician's office	0.70	0.61	0.71
Share FQHC	0.04	0.08	0.04
Share Clinic	0.07	0.06	0.10
Share Outpatient Hospital	0.11	0.15	0.08
Other Place of Service	0.08	0.10	0.07
Ν	24190197	9650064	106214000
Provider Characteristics			
Share male	0.62	0.54	0.56
Average experience (years)	22.32	19.49	21.48
SD	12.46	12.16	12.23
Degree			
Share Physician	0.83	0.74	0.82
Share Nurse Practitioner or Physician Assistant	0.17	0.26	0.18
Top 3 Most Common Specialties			
1	Internal Medicine	Family Medicine	Family Medicine
2	Family Medicine	Internal Medicine	Internal Medicine
3	Psychiatry & Neurology	Psychiatry & Neurology	Psychiatry & Neurology
N	13984956	5026886	63120194

Table 8: Provider and Place of Service Characteristics by Medicaid Enrollee Type

This table depicts place and provider characteristics of all E&M visits reported by Medicaid recipients in 2018-2019 by enrollee type. The share of all E&M visits a patient has in a given year in a particular place of service are reported under Place of Service. Provider characteristics are reported for physicians (MD/DO) and advanced practice providers (APP) treating Medicaid recipients in an office E&M setting. E&M visits of are identified using TAF 2018-2019. The sample includes all visits for enrollees aged 18-64 years who do not reside in a 209b state or Oregon. Year of graduation from medical school is obtained from the Doctors and Clinicians national downloadable file from CMS. Degree and specialty information is obtained from the NPPES. Of the providers observed treating Medicaid enrollees, 66% have a non-missing year of graduation.



Figure 2: Ratio of All Providers to Patients by Enrollee Type

This figure depicts the ratio of all providers to Medicaid recipients by enrollee type. Ratios are calculated by dividing the count of providers who treat adult Medicaid recipients within a given county by the total number of Medicaid recipients within that county. Recipients and E&M visits are identified using the TAF 2018-2019. Provider types are identified from the NPPES. The sample of Medicaid enrollees is restricted to those aged 18-64. Recipients who reside in a 209b state or Oregon are removed from the sample.

However, our adjusted results in Table 9 reverse some of these findings. In particular, after adjusting for recipient sex, age, urban county of residence, and state-of-residence, we find that disabled adults without SSI are more likely to receive care in a physician's office compared to SSI recipients. They are also more likely to receive care from a physician (as opposed to a nurse practitioner or physician's assistant) in an office setting than SSI recipients. Finally, they are more likely to live in counties with higher provider-to-patient ratios than SSI recipients. Therefore, the results in this subsection are highly sensitive to the controls used in the regression analysis, particularly the state fixed effects. This sensitivity suggests that the geographic dispersion of disabled adults without SSI may be very different than that of SSI recipients. In future work, we hope to redefine our sample of disabled adults without SSI to include adults with Social Security Disability Insurance (SSDI) benefits, instead of limiting our sample to adults who answered affirmatively to one of the six questions about cognitive and functional limitations.²

 $^{^{2}}$ We are concerned that the 6-question survey is not asked with the same frequency in every state.

	(1)	(2)	(3)	(4)
	Share in Office	Share in Clinic	Share w/ Physician in Office	Provider-to-Patient Ratio
SSI Recipients	-0.0420***	-0.000261***	-0.0380***	-0.00284***
	(0.0000838)	(0.0000605)	(0.0000945)	(0.0000382)
Non-SSI Disabled Enrollees	-0.0296***	-0.00639***	-0.00940***	0.00224^{***}
	(0.000144)	(0.000104)	(0.000167)	(0.0000644)
Observations	140054252	140054252	82132036	25209470
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Mean	0.70	0.13	.77	0.09

Table 9: Provider and Place of Service Characteristics of E&M Visits by Enrollee Type

This table depicts estimates from regressions of provider and place-of-service-related outcomes on indicators for Medicaid enrollee type (SSI recipient, disabled non-SSI recipient, and non-disabled). Data is obtained from TAF for 2018-2019. Outcomes include the share of a recipient's visits in a physician's office, the share of a recipient's visits in a clinic, the share of a recipient's office visits with a physician, and the ratio of providers (MD/DOs and APPs) to enrollees in each enrollee's county. The sample is restricted to non-dual Medicaid enrollees aged 18-64 years for all models, and enrollees residing in 209b states or Oregon are removed from the sample. Controls for gender, age, chronic condition status, urban county residence, and state and year fixed effects are included in all specifications. Columns 1-3 are at the visit level, while Column 4 is at the beneficiary level. Column 3 is additionally restricted to visits that occurred in an office setting.

1.3 Documenting Disparities in Outcomes

The goal of this aim is to show how health outcomes vary by race/ethnicity within the SSI population, and how health outcomes for SSI enrollees compare to health outcomes for non-SSI disabled enrollees and non-disabled adults in Medicaid. We consider three types of health outcomes. First, we focus on differences in mortality rates. Second, we show differences in rates of chronic conditions. Third, we show differences in rates of emergency health care utilization (e.g., emergency department visits and inpatient hospital stays).

1.3.1 Racial/Ethnic Differences in SSI

Figure 3 and Tables 10 - 12 show our health outcomes results for SSI recipients of different races/ethnicities. Figure 3 shows that death rates are highest among White SSI recipients (2.1% per per), followed by Black SSI recipients (1.6%), then Other race recipients (1.45%), and finally Hispanic SSI recipients (1.3%). Table 10 then shows information about chronic conditions by race/ethnicity. We focus on the 27 chronic conditions documented in the Chronic Conditions Data Warehouse (CCW) (CMS). We use ICD-10 diagnosis codes on outpatient and inpatient claims (TAF OT & IP files) to determine whether patients have any of these 27 conditions. We find that the share of recipients with any chronic condition is similar across White, Black, and Hispanic SSI recipients (≈ 0.47). The average number of chronic conditions per recipient is slightly over 1 (≈ 1.08) for all groups. We find larger differences between racial/ethnic groups when examining the probability that recipients have any of the top-10 most common chronic conditions. For example, Black SSI recipients are the most likely to have hypertension. About 50% of Black SSI recipients. White recipients are more likely to have depression (36%) compared with Black and Hispanic recipients (26% and 34%, respectively). White recipients are also more likely to have chronic obstructive pulmonary disease (COPD = 20%) vs. Black/Hispanic recipients (11% and 7%,

respectively). Hispanic recipients are more likely to have diabetes (33%) compared to White and Black recipients (25% and 28%, respectively). One takeaway from these results is that White SSI recipients may be in somewhat worse overall health, given their higher mortality rates and higher rates of chronic conditions associated with shorter life expectancy (e.g., COPD, ischemic heart disease).

Our adjusted results in Table 11 mostly reflect our unadjusted results. The probability of mortality is highest among White SSI recipients. Hispanic SSI recipient are the most likely to be diagnosed with at least one chronic condition, followed by White, then Other, and then Black SSI recipients. Similarly, the average number of chronic conditions is highest among Hispanic recipients (0.15 higher than White), but is very similar across White, Black, and Other race/ethnicity recipients.



Figure 3: Death Rates among SSI Recipients by Race and Ethnicity

This figure depicts the share of SSI recipients that are reported as deceased in 2018-2019 by race/ethnicity. Recipients are identified using the TAF 2018-2019. The sample of SSI recipients is restricted to those aged 18-64. Recipients who reside in a 209b state or Oregon are removed from the sample.

	(1)	(2)	(3)
	White	Black	Hispanic
	Mean	Mean	Mean
Has Chronic Condition	0.47	0.47	0.46
# Chronic Conditions	1.08	1.10	1.05
Top 10 Conditions			
Hypertension	0.35	0.50	0.38
Depression	0.36	0.27	0.34
Diabetes	0.25	0.28	0.33
Chronic Kidney Disease	0.15	0.19	0.19
Hyperlipidemia	0.16	0.15	0.17
Arthritis	0.16	0.15	0.15
Chronic Obstructive Pulmonary Disease & Bronchiectasis	0.20	0.11	0.07
Anemia	0.11	0.16	0.13
Ischemic Heart Disease	0.12	0.10	0.09
Asthma	0.07	0.10	0.11

Table 10: Chronic Conditions among SSI Recipients by Race/Ethnicity

This table depicts the share of SSI recipients with any chronic condition, the average number of chronic conditions per recipient, and the share of recipients with each of the top 10 most common chronic conditions by race and ethnicity. For average number of chronic conditions and share of each condition, zeroes are imputed for beneficiaries with no reported chronic conditions. Recipients are identified using the TAF 2018-2019. The sample of SSI recipients is restricted to those aged 18-64. Recipients who reside in a 209b state or Oregon are removed from the sample. 27 different chronic conditions are identified using ICD-10 diagnosis codes on outpatient, inpatient, and other institutional claims following the Chronic Conditions Warehouse (CCW).

	(1)	(2)	(3)
	P(Death)	P(Chronic Condition)	# Chronic Conditions
Black	-0.00580***	-0.00917***	0.00725***
	(0.000163)	(0.000545)	(0.00177)
Hispanic	-0.00593***	0.0420***	0.148***
	(0.000185)	(0.000690)	(0.00217)
Other	-0.00552***	-0.00101	-0.0176***
	(0.000299)	(0.00113)	(0.00343)
Observations	4509889	4509889	4509889
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Mean	0.02	0.47	1.08

* p < 0.05, ** p < 0.01, *** p < 0.001

This table depicts a regression of the death indicator and chronic condition outcomes on race indicators among SSI recipients. Data is obtained from TAF for 2018-2019. Outcomes include the likelihood a beneficiary is deceased, the likelihood a beneficiary has a chronic condition, and the average number of chronic conditions per beneficiary. 27 different chronic conditions are identified using ICD-10 diagnosis codes on outpatient, inpatient, and other institutional claims following the Chronic Conditions Warehouse (CCW). For average number of chronic conditions, zeroes are imputed for recipients with no reported chronic conditions. The sample is restricted to SSI recipients aged 18-64 years for all models, and recipients residing in 209b states or Oregon are removed from the sample. Controls for gender, age, urban county residence, and state and year fixed effects are included in all specifications. Controls for chronic conditions status are included in column 1.

Next we turn to our results on how emergency health care utilization differs by race/ethnicity among SSI recipients. Table 12 shows that Black SSI recipients have the most emergency department visits (1.27 per year) compared to White and Hispanic SSI recipients (1.07 and 1.03, respectively). Black SSI recipients also have more hospitalizations (0.2 per year) compared to White and Hispanic recipients (0.19 and 0.17, respectively).

Table 12: 1	Emergency	Health	Care	Utilization	by	Race	/Ethnicity	y in	SSI
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	White	Black	Hispanic
	Mean	Mean	Mean
ED Visits			
General	1.068	1.267	1.030
% Non-emergent	17.8	20.1	19.1
% Emergent, primary care needed	21.2	20.9	22.0
% Emergent, ED care needed, preventable	6.7	6.8	6.8
% Emergent, ED care needed, not preventable	20.1	19.9	0.203
Inpatient Hospitalizations			
General	.187	.199	.173
% ACS	3.0	2.6	2.6
N	2162249	1431029	723998

This table reports the average number of total ED visits, total inpatient hospitalizations, and ambulatory care sensitive hospitalizations per patient-year among SSI recipients. This table also reports the likelihood that an ED visit is considered nonemergent, primary care treatable, preventable, or non-preventable, or that a hospitalization is ambulatory care sensitive (ACS). Avoidable ED visits are identified following Johnston et al. (2017). ACS hospitalizations are identified using the updated ICD-10 version of Billings et al. (1993) algorithm provided by NYU (Billings). Recipients in the top 99th percentile of number of ED visits and hospitalizations are removed from the sample. Data is sourced from the TAF 2018-2019. The sample includes SSI recipients aged 18-64 years old who do not reside in 209b state or Oregon.

The results from our adjusted regression analysis confirms these differences; Table 13 shows that Black SSI recipients have 0.2 more ED visits per year compared to White SSI recipients, and they have 0.007 more hospitalizations. They are 25% (= $\frac{0.11}{0.44} \times 100\%$) more likely to have a "primary care avoidable" ED visit compared to White SSI recipients, and they are 5.5% (= $\frac{0.00166}{0.03} \times 100\%$) more likely to have an "ambulatory care sensitive" hospitalization compared to White SSI recipients. These results are particularly significant in light of our results on mortality, chronic conditions, and primary care access to primary care compared to Black SSI recipients. As a result, we find that Black SSI recipients are more likely to require emergency care. These results are consistent with other research that has shown Black patients have worse access to care than White patients (Brown et al., 2016; Shi et al., 2014; Johnston et al., 2021; Wisniewski and Walker, 2020; Ray et al., 2015; Franks et al., 2005).

	(1)	(2)	(3)	(4)
	# ED Visits	# Hospitalizations	P(Avoidable ED Visit)	# ACS Hospitalizations
Black	0.199^{***}	0.00619^{***}	0.110***	0.00166***
	(0.00219)	(0.000613)	(0.00105)	(0.000381)
Hispanic	0.0163***	-0.0183***	0.0325^{***}	-0.00418***
1	(0.00264)	(0.000739)	(0.00127)	(0.000434)
Other	-0.280***	-0.0324***	-0.111***	-0.0107***
	(0.00390)	(0.00116)	(0.00179)	(0.000531)
Observations	4509889	4509889	4509889	4509889
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Mean	1.11	0.19	0.44	0.03
	0.04 distribution	0.004		

Table 13: ED Visits and Hospitalizations by Race/Ethnicity in SSI

This table depicts a regression of emergency health care utilization outcomes on race indicators among SSI recipients. Data is obtained from TAF for 2018-2019. Outcomes include the number of ED visits, number of hospitalizations, the probability a recipient has an avoidable (either non-emergent or primary care treatable) ED visit, and the number of ambulatory care sensitive (ACS) hospitalizations. Avoidable ED visits are identified following Johnston et al. (2017). ACS hospitalizations are identified using the updated ICD-10 version of Billings et al. (1993) algorithm provided by NYU (Billings). The sample is restricted to SSI recipients aged 18-64 years for all models, and recipients residing in 209b states or Oregon are removed from the sample. Controls for gender, age, chronic condition status, urban county residence, and state and year fixed effects are included in all specifications.

1.3.2 Differences by Medicaid Enrollee Type

Now we compare health outcomes, chronic conditions, and emergency health care utilization across enrollee types in Medicaid. First, Figure 4 shows that death rates are almost 2.5 times higher for SSI enrollees (1.3% per year) compared to non-SSI adults with disabilities (0.5% per year), and death rates are lowest for adults without disabilities (0.25% per year). Second, Table 14 shows that SSI enrollees are the most likely to have at least one chronic condition (60%) compared to non-SSI adults with disabilities (41%) and adults without disabilities (32%). The average number of chronic conditions is highest among SSI enrollees (1.35). Among the top-10 most common chronic conditions, SSI enrollees are more likely to have each one, with the exception of depression and anemia. 48% of adults with disabilities without SSI have diagnosed depression compared with 33% of SSI enrollees. Our adjusted results in Table 15 confirm our unadjusted estimates: adults with disabilities are more likely to have at least one chronic condition, and have more chronic conditions total, compared to adults without disabilities. In addition, adults with disabilities on SSI appear to be sicker, on average, than adults with disabilities not on SSI.



Figure 4: Death Rates among by Enrollee Type

This figure depicts the share of Medicaid enrollees that are reported as deceased in 2018-2019 by enrollee type. Enrollees are identified using the TAF 2018-2019. The sample of enrollees is restricted to those aged 18-64. Enrollees who reside in a 209b state or Oregon are removed from the sample.

	(1)	(2)	(3)
	SSI Recipient	Non-SSI Disabled	Other Enrollee
	Mean	Mean	Mean
Has Chronic Condition	0.60	0.41	0.32
# Chronic Conditions	1.35	0.73	0.52
Top 10 Conditions			
Hypertension	0.40	0.25	0.26
Depression	0.33	0.48	0.33
Diabetes	0.27	0.17	0.18
Chronic Kidney Disease	0.16	0.10	0.09
Hyperlipidemia	0.16	0.10	0.12
Arthritis	0.17	0.11	0.10
Chronic Obstructive Pulmonary Diesease and Bronchiectasis	0.14	0.06	0.04
Anemia	0.12	0.15	0.14
Ischemic Heart Disease	0.11	0.06	0.05
Asthma	0.09	0.08	0.08

Table 14: Chronic Conditions by Enrollee Type

This table depicts the share of Medicaid enrollees with any chronic condition, the average number of chronic conditions per enrollee, and the share with each of the top 10 most common chronic conditions by enrollee type. 27 different chronic conditions are identified using ICD-10 diagnosis codes on outpatient, inpatient, and institutional claims following the Chronic Conditions Warehouse (CCW). For average number of chronic conditions and share of each condition, zeroes are imputed for enrollees with no reported chronic conditions. Enrollees are identified using the TAF 2018-2019. The sample of enrollees is restricted to those aged 18-64. Enrollees who reside in a 209b state or Oregon are removed from the sample.

	(1)	(2)	(3)
	P(Death)	P(Chronic Condition)	# Chronic Conditions
SSI Recipients	0.00782^{***}	0.153^{***}	0.510^{***}
	(0.0000671)	(0.000308)	(0.000921)
Non-SSI Disabled Enrollees	0.00378***	0.0662***	0.170***
	(0.0000985)	(0.000526)	(0.00140)
Observations	25209470	25209470	25209470
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Mean	0.00	0.36	0.63
	0.001		

Table 15: Death and Chronic Conditions by Enrollee Type

* p < 0.05, ** p < 0.01, *** p < 0.001

This table depicts estimates from regressions of the death indicator and chronic condition outcomes on enrollee type indicators among Medicaid enrollees. Data is obtained from TAF for 2018-2019. Outcomes include the likelihood a beneficiary is deceased, the likelihood a beneficiary has a chronic condition, and the average number of chronic conditions per beneficiary. 27 different chronic conditions are identified using ICD-10 diagnosis codes on outpatient, inpatient, and institutional claims following the Chronic Conditions Warehouse (CCW).For average number of chronic conditions, zeroes are imputed for enrollees with no reported chronic conditions. The sample is restricted to Medicaid enrollees aged 18-64 years for all models, and enrollees residing in 209b states or Oregon are removed from the sample. Controls for gender, age, urban county residence, and state and year fixed effects are included in all specifications. Controls for chronic condition status are included in column 1.

able 16 shows that people with disabilities, regardless of whether they qualify for SSI or not, have 1.3 emergency department (ED) visits per year, whereas adults without disabilities on Medicaid

have 0.8 ED visits per year. Table 16 also shows that adults with disabilities on SSI have the most hospitalizations per year (0.18) compared to adults with disabilities not on SSI (0.17) and adults without disabilities (0.12). Table 17 confirms these results after adjusting for recipient demographics and stateof-residence. We continue to find that adults with disabilities have more ED visits and hospitalizations than adults without disabilities (columns 1 & 2). Adults with disabilities have more avoidable ED visits and ambulatory care sensitive hospitalizations than adults without disabilities (columns 3 & 4). We also find that adults with disabilities on SSI have more emergency health care utilization than adults with disabilities not on SSI. In general, the results from this section suggest that adults with disabilities who are on SSI are in the poorest health among the three groups that we study.

	SSI Enrollees	Non-SSI Disabled Enrollees	All Other Enrollees
	Mean	Mean	Mean
ED Visits			
General	1.308	1.275	0.821
% Non-emergent	19.3	22.4	20.6
% Emergent, primary care needed	21.4	22.3	23.0
% Emergent, ED care needed, preventable	6.7	5.5	4.9
% Emergent, ED care needed, not preventable	20.0	17.2	17.6
Inpatient Hospitalizations			
General	0.179	0.168	0.119
% ACS	2.4	1.0	1.1
N	2952146	1351809	20905516

Table 16: Emergency Health Care Utilization by Medicaid Enrollee Type

This table reports the average number of total ED visits, total inpatient hospitalizations, and ambulatory care sensitive hospitalizations per patient-year among Medicaid enrollees. This table also reports the likelihood that an ED visit is considered nonemergent, primary care treatable, preventable, or non-preventable, or that a hospitalization is ambulatory care sensitive (ACS). Avoidable ED visits are identified following Johnston et al. (2017). ACS hospitalizations are identified using the updated ICD-10 version of Billings et al. (1993) algorithm provided by NYU (Billings). Data is sourced from the TAF 2018-2019. The sample includes Medicaid enrollees aged 18-64 years old who do not reside in 209b state or Oregon.

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