

Transportation barriers for Iowa Medicaid-enrolled adults with and without non-emergency medical transportation services

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Abstract

Introduction: State Medicaid programs must provide transportation to medical appointments through the non-emergency medical transportation (NEMT) benefit. Iowa is one of a few states not required to provide NEMT for adults in their Medicaid expansion program if not medically exempt or under age 21.

Methods: Data from a 2022 survey assessed transportation barriers for 3 adult Iowa Medicaid groups ($n = 2181$): (1) expansion without NEMT, (2) expansion with NEMT through medical exemption/age, and (3) traditional Medicaid members. Primary outcomes were transportation-related missed health visits, unmet health care needs, unmet transportation needs, and transportation cost concerns. Logistic regression examined transportation barriers by Medicaid group and sociodemographic and health factors.

Results: Recipients without NEMT reported fewer transportation barriers than recipients with NEMT. For example, 6% of expansion members without NEMT reported transportation-related missed health visits (past 6 months) vs 15% for expansion members with NEMT and 11% for traditional Medicaid members. Few Medicaid group differences remained in adjusted models. NEMT benefit impact was limited by low reported awareness and use of the benefit and higher vulnerabilities in NEMT-eligible populations.

Conclusion: Adults in all Medicaid groups could benefit from transportation services, but innovation is needed to determine more effective ways to meet transportation needs.

Key words: transportation barriers; Medicaid; NEMT.

Introduction

Transportation is a key social determinant of health. Transportation barriers, such as not owning a vehicle and other forms of transportation insecurity, are associated with less preventive service use, more medical care delays and missed appointments, worse chronic condition management, and more emergency room (ER) use.¹⁻⁸ Nearly 6 million individuals in the United States delay medical appointments each year due to transportation problems.⁹ The burden of transportation problems falls predominantly on the most vulnerable, including those with lower incomes and education, chronic health conditions, and minority racial/ethnic status.^{1,8-12}

One particularly vulnerable population for which few studies have examined transportation barrier prevalence are Medicaid-enrolled adults. One national study using the 2017 National Health Interview Survey (NHIS) revealed that 5.6% of adult Medicaid recipients reported delayed medical care due to transportation problems in the past year compared with 1.9% of US adults overall.⁹ The importance of transportation to accessing health care for Medicaid-enrolled adults is incorporated into federal law by requiring state Medicaid programs to

provide transportation to medical appointments as part of the non-emergency medical transportation (NEMT) benefit.¹³

The impact of transportation on access to care for Medicaid members is particularly policy relevant because the Centers for Medicare and Medicaid Services (CMS) has granted some states the ability to waive the NEMT benefit for certain adults, including those eligible through Medicaid expansion. Proponents of maintaining NEMT services for Medicaid-enrolled adults argue that it is essential for addressing social determinants of health and promoting access to health care among a highly vulnerable population.¹⁴⁻¹⁷ Others believe it is feasible to align Medicaid with commercial insurance plans, which typically do not offer transportation for non-emergency medical appointments.^{16,18}

Iowa is one of a small number of states granted a Section 1115 waiver of CMS's requirement to provide NEMT services, specifically for adults in their Medicaid expansion program called the Iowa Health and Wellness plan, which extends coverage to adults with higher incomes up to 138% of the federal poverty level (FPL).¹³ First approved in 2014, the waiver of NEMT services covers all expansion-eligible adults except for those who have health problems that qualify them as medically exempt and a small percentage of recipients

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under age 21 covered by the Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) program.

A survey was conducted in 2022 with a sample of adults in the expansion program and adults in the traditional Iowa Medicaid program who maintained their NEMT benefit. Data from this survey were used to assess the following: (1) awareness and use of NEMT services, (2) prevalence of transportation-related barriers to care in 3 Iowa Medicaid groups, and (3) sociodemographic and health factors associated with transportation barriers in bivariate and adjusted models. Medicaid groups include (1) expansion members without NEMT, (2) expansion members with NEMT through medical exemption/EPSDT, and (3) traditional Medicaid members. Expansion members without NEMT have more sociodemographic and health advantage than the other groups, but transportation problems may still be present. The other groups have access to free transportation services, but transportation may still interfere with health care access if awareness and use of the NEMT benefit is low. This survey was conducted as part of a broader evaluation of the Iowa Medicaid expansion program being conducted at the University of Iowa.

Methods

Sampling and survey methods

Information related to the expansion program's NEMT waiver and other transportation-related issues was collected as part of a survey of Iowa Medicaid recipients conducted in the summer/fall of 2022. We used Iowa Medicaid enrollment data to randomly sample 6000 Medicaid expansion members and 6000 adult traditional Medicaid members primarily eligible through Temporary Assistance to Needy Families (TANF) and not covered due to pregnancy or disability. Members were eligible for sampling if they were in their health plan at least 6 months, aged 19–64 years, not in Medicare, and had a phone number. One person per household was selected to reduce household burden and response relatedness.

The survey utilized a sequential mixed-mode strategy combining mail (with internet option) and telephone follow-up to nonrespondents. Surveys were sent at the end of June 2022 and could be completed on paper or online. Two nominal incentives were used to maximize response rates: (1) initial mailed surveys contained a \$2 bill and (2) respondents returning the survey within 2 weeks entered a lottery for 1 of 20 \$100 Wal-Mart gift cards. Reminder postcards were sent 1 week after the first mailing; a second survey was mailed to nonrespondents 5 weeks after the first mailing. Follow-up phone calls to complete the survey began 3 weeks after the second mailing, with at least 2 attempts per person. The phone follow-up period closed at the end of October 2022.

There were 1216 Medicaid expansion members and 1055 adult traditional Medicaid members who responded to the survey for overall adjusted response rates of 26% for the expansion sample and 21% for the Medicaid sample. Response rates were adjusted by removing those ineligible to complete a survey because their address was no longer valid, they moved out of state, died, or were incarcerated. These response rates are comparable to other surveys of Medicaid recipients.^{19–21}

Survey instrument and study measures

Iowa Medicaid member surveys have been conducted about every 1.5 years for over 20 years by this research team. The survey instrument contains many sociodemographic, health,

and health care questions from national surveys such as NHIS and the Consumer Assessment of Health Care Providers and Systems Health Plan Survey and others specific to Iowa Medicaid.

Survey transportation items were adapted from the best available and those used in other state Medicaid evaluation studies.^{22,23} Respondents were asked 2 questions about awareness and use of NEMT services: (1) “Some health plans provide transportation services for regular (not emergency) health care. Does your MCO [managed care organization]/Medicaid provide transportation services for regular health care visits?” and (2) “In the last 6 months, have you used transportation services provided by your MCO/Medicaid to get to a regular health care visit?”

Two questions related to need for transportation assistance assessed (1) type of transportation used most often to get to health care visits and (2) how often respondents needed assistance from other sources (friends, family, public transportation, etc) to get to health care visits in the past 6 months. Responses of sometimes/usually/always indicated a need for assistance.

Transportation-related missed appointments were assessed by asking “In the last 6 months, have you missed any regular health care visits due to problems with transportation?” For unmet health care need due to transportation, respondents reported if there was any time in the last 6 months they needed but did not receive the following due to transportation: check-up or routine care, preventive care, mental health care, or dental care. Unmet need for transportation to a health visit was assessed by asking if there was any time in the last 6 months that respondents needed transportation for a health care visit but could not get it. Cost concerns were assessed by asking, “In the last 6 months, how much have you worried about your ability to pay for the cost of transportation to or from a health care visit?” Responses of a little/somewhat/a great deal indicated a transportation cost concern.

Transportation-related barriers were examined by Medicaid program and NEMT eligibility: (1) expansion members without NEMT, (2) expansion adults with the NEMT benefit through medical exemption or EPSDT, and (3) traditional Medicaid members with NEMT. Twenty percent of the original expansion sample was classified as medically exempt and an additional 1% qualified for NEMT through EPSDT eligibility.

Several sociodemographic and health and health care need variables were included as covariates. Respondents self-reported their race/ethnicity (White, Black, Hispanic, multiple race/other), age (19–34, 35–54, 55–65 years), education (< high school, high school diploma, some college, 4-year degree or more), gender, and employment status. Income (0%–50% FPL, 51%–100% FPL, 101%–138% FPL), zip code, and enrollment duration came from Medicaid enrollment records. Rural–urban commuting area (RUCA) codes were classified as rural (codes 7–10), suburban/large town (codes 2–6), and urban (coding of 1). Medicaid enrollment duration counted the number of months enrolled in any Medicaid program in the past 5 years.

Respondents reported their overall health status and if they had an activity limitation (health problem that seriously interferes with activities, quality of life, or requires assistance for routine needs). For chronic conditions, respondents reported which of 27 common chronic physical or mental health conditions they had. Two indicators of health care need include whether the respondent reported a need for specialist medical care or for mental health care in the past 6 months.

Table 1. Characteristics of respondents by Iowa Medicaid Group.

	Expansion—no NEMT (<i>n</i> = 903)	Expansion with NEMT (<i>n</i> = 247)	Traditional Medicaid (<i>n</i> = 1031)
Race/ethnicity (%)			
White	80%	85%	72%
Black	7%	3%	11%
Hispanic	8%	6%	10%
Multiple race/other	5%	6%	7%
Age (%)			
19–34 y	32%	27%	49%
35–54 y	37%	40%	47%
55–65 y	31%	33%	4%
Education (%)			
Less than high school diploma	10%	9%	10%
High school diploma	37%	43%	39%
Some college	37%	38%	39%
4-y degree or more	16%	9%	12%
Residence (RUCA) (%)			
Rural	28%	26%	27%
Suburban/large town	27%	28%	26%
Urban	45%	45%	47%
Gender (%)			
Male	38%	36%	10%
Female	62%	64%	90%
FPL (%)			
0%–50% FPL	59%	62%	100%
51%–100% FPL	25%	20%	0%
101%–138% FPL	17%	18%	0%
Employment status (%)			
Employed full-time	41%	24%	39%
Employed part-time	25%	26%	23%
Not employed	34%	50%	39%
Medicaid enrollment (%)			
6–23 mo	22%	17%	15%
2–4 y	47%	43%	43%
5 y or more	31%	40%	42%
Self-rated health (%)			
Excellent/good	78%	63%	76%
Fair or poor	22%	37%	24%
Limitation in activity (%)			
No	72%	49%	73%
Yes	28%	51%	27%
Chronic conditions (%)			
None or 1	40%	19%	35%
2 or 3	33%	27%	31%
4 or more	26%	53%	33%
Need for specialist care (%)			
No	65%	49%	63%
Yes	35%	51%	37%
Need for mental health care (%)			
No	81%	57%	71%
Yes	19%	43%	29%

Source: 2022 Iowa Medicaid Member Survey. Data are unweighted because percentages were all calculated within Medicaid groups (the variable used for developing weights). Weighted and unweighted percentages are the same in this case.

Abbreviations: FPL, federal poverty level; NEMT, non-emergency medical transportation; RUCA, rural–urban commuting area.

Analysis

Descriptive statistics summarize the study sample and proportion of Medicaid members in different groups who thought their health plan provided NEMT services and reported using NEMT. The prevalence of transportation-related barriers to care was assessed by Medicaid group and respondent sociodemographic and health factors. Chi-square tests assessed bivariate associations. Logistic regression models assessed adjusted associations of Medicaid group and respondent sociodemographic and health characteristics with transportation-related barriers to care. Regression results

are reported as adjusted percentage point differences in the prevalence of transportation barriers across groups calculated using predicted marginal effects.

The final study sample included only individuals with no missing data on study covariates (expansion, *n* = 1150; traditional Medicaid, *n* = 1031). Missing data were imputed for education (16% of sample) and race/ethnicity (3% of sample). Multiple imputation models with education and race/ethnicity as outcomes used sociodemographic and health covariates from this study and 6 health care variables from the broader survey as predictors. Study results were inspected vs those using complete cases to

ensure associations remained similar. Analyses were conducted using Stata (StataCorp). Weights were applied to account for differential sampling and nonresponse by Medicaid program.

Limitations

Nonresponse bias tests indicated some demographic differences between our original population and our respondents. Analyses using Medicaid enrollment records showed that nonrespondents were more likely non-White, younger, and male than respondents (see [Appendix S1](#)). These factors did not show many associations with study outcomes, but nonresponse bias from additional sources could also influence results. Comparisons were made between 3 Medicaid groups, but these groups differ considerably in their eligibility and underlying health and demographic characteristics. Traditional Medicaid members are initially eligible only up to 50% of the FPL and tend to be women, whereas expansion members are more likely male. The study also relied on self-reported data, which could be subject to recall bias.

Results

Respondent characteristics

Sociodemographic and health characteristics of respondents in 3 Iowa Medicaid groups are shown in [Table 1](#). Overall, expansion members without NEMT were more advantaged than the other groups, with considerably better health and more employment than expansion members with NEMT, and they were more likely White, older, and male and had a higher income than traditional Medicaid members.

Reporting a race other than White was lower for expansion members without NEMT (20%) and expansion members with NEMT through medical exemption/EPSTD (15%) than for traditional Medicaid members (28%). Expansion members were significantly older than traditional Medicaid members; approximately one-third of the no-NEMT group and one-quarter of the expansion-with-NEMT group were under age 35 years, compared with approximately half of traditional Medicaid members. Just over 60% of respondents in both expansion groups were females compared with 90% of respondents in traditional Medicaid. Based on eligibility, expansion members overall had higher incomes, with approximately 40% above 50% of the FPL compared with none in traditional

Medicaid. Expansion members with NEMT through medical exemption/EPSTD had the lowest health status (almost by definition), with approximately half reporting an activity limitation, 4 or more chronic conditions, and need for specialist care.

Awareness and use of the NEMT benefit

Accurate awareness of NEMT benefit availability was low for all 3 groups ([Figure 1](#)). Fifteen percent of the expansion group without NEMT were accurately aware they did not have the NEMT benefit; 84% were either not sure or thought they had the benefit. Only one-quarter (26%) of expansion members with NEMT were accurately aware that their health plan provided transportation for non-emergency health care visits. The proportion of traditional Medicaid members who knew their coverage included NEMT was even lower (19%). The proportion of Medicaid members with NEMT who reported using the service was also quite low (9% of expansion members with NEMT and 3% of traditional Medicaid members used NEMT services in the past 6 months). Among the subgroup of respondents who reported awareness of their NEMT benefit, 35% of expansion members with NEMT and 16% of traditional Medicaid members reported using NEMT services (data not shown).

Prevalence of transportation-related barriers to care

On average, across all Medicaid groups, approximately 1 in 5 Medicaid members reported not driving themselves to health visits ([Table 2](#)). The reported need for transportation assistance in the past 6 months was lower for expansion members without NEMT (28%) than for expansion members with NEMT (49%) and traditional Medicaid members (37%).

For transportation-related outcomes, expansion members without NEMT were less likely to report missed appointments, unmet transportation needs, and transportation cost concerns than the other groups. Six percent of expansion members without NEMT missed a health appointment in the past 6 months due to transportation, compared with 15% for the expansion-with-NEMT group and 11% for traditional Medicaid members. Unmet transportation needs showed a similar pattern. Nearly one-third of expansion members without NEMT (29%) had health visit transportation

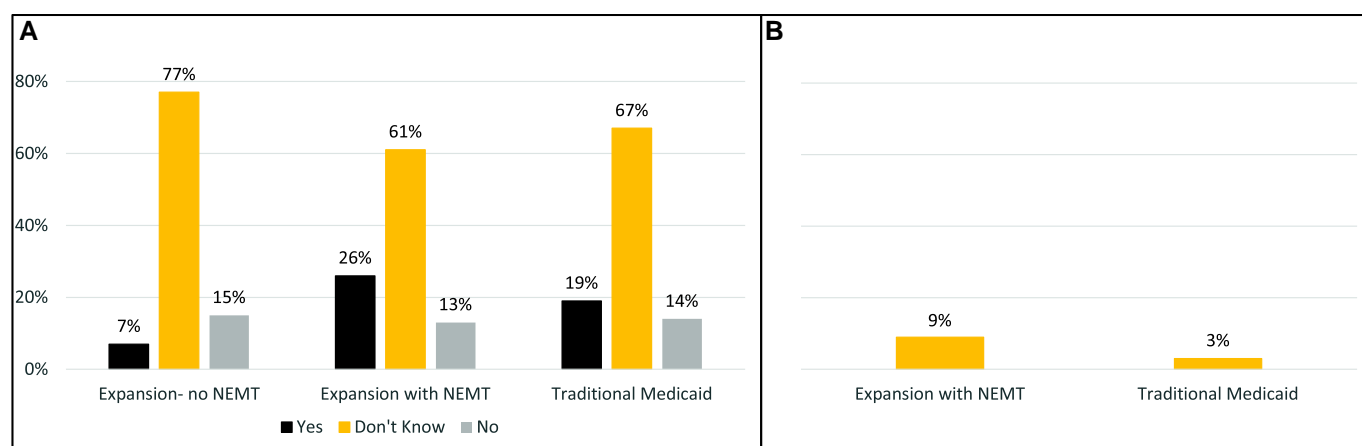


Figure 1. A: Percentage of respondents who thought their health plan provided non-emergency medical transportation (NEMT) services by Iowa Medicaid Group. B: Percentage of respondents who reported using NEMT services by Iowa Medicaid Group. Source: 2022 Iowa Medicaid Member Survey.

Table 2. Percentage of respondents reporting transportation-related barriers to care in the past 6 months by Iowa Medicaid Group and demographic and health characteristics.

	Need for assistance with transportation, weighted %		Transportation-related outcomes, weighted %			
	Regular transportation—does not drive to health visits	Needed assistance with transportation	Transportation-related missed health visit	Transportation-related unmet health care need	Unmet need for transportation to health visit	Concern about cost of transportation to health visits
Overall	21%	34%	9%	8%	8%	33%
Medicaid group						
Expansion– no NEMT	20%	28%	6%	7%	6%	29%
Expansion with NEMT	33%	49%	15%	10%	11%	37%
Traditional Medicaid	16%	37%	11%	9%	9%	40%
Chi-square, <i>P</i>	<.001	<.001	<.001	NS	<.05	<.001
Race/ethnicity						
White	20%	33%	8%	8%	7%	34%
Black	30%	44%	14%	8%	10%	34%
Hispanic	19%	35%	6%	5%	5%	28%
Multiple race/other	26%	37%	12%	13%	10%	35%
Chi-square, <i>P</i>	<.05	NS	<.05	NS	NS	NS
Age						
19–34 y	20%	33%	7%	7%	7%	32%
35–54 y	20%	35%	11%	10%	8%	35%
55–65 y	24%	34%	7%	5%	7%	33%
Chi-square, <i>P</i>	NS	NS	<.01	<.05	NS	NS
Education						
Less than high school diploma	37%	49%	14%	12%	12%	39%
High school diploma	23%	35%	9%	8%	9%	31%
Some college	16%	31%	8%	8%	6%	36%
4-y degree or more	15%	29%	5%	6%	5%	29%
Chi-square, <i>P</i>	<.001	<.001	<.01	NS	<.05	<.05
Residence (RUCA)						
Rural	17%	31%	7%	7%	5%	36%
Suburban/large town	23%	36%	8%	9%	8%	32%
Urban	22%	35%	10%	7%	9%	33%
Chi-square, <i>P</i>	<.05	NS	NS	NS	<.05	NS
Gender						
Male	26%	37%	8%	7%	8%	33%
Female	19%	33%	9%	8%	7%	34%
Chi-square, <i>P</i>	<.001	NS	NS	NS	NS	NS
FPL						
0%–50% FPL	23%	37%	10%	9%	9%	35%
51%–100% FPL	15%	27%	5%	4%	4%	30%
101%–138% FPL	15%	25%	4%	5%	3%	29%
Chi-square, <i>P</i>	<.001	<.001	<.01	<.01	<.001	NS
Employment						
Full-time	9%	18%	4%	5%	4%	24%
Part-time	16%	35%	8%	7%	6%	34%
Not employed	36%	49%	14%	11%	12%	43%
Chi-square, <i>P</i>	<.001	<.001	<.001	<.001	<.001	<.001
Medicaid enrollment						
6–23 mo	20%	34%	9%	5%	7%	30%
2–4 y	19%	32%	8%	8%	7%	31%
5 y or more	23%	37%	9%	8%	9%	38%
Chi-square, <i>P</i>	NS	NS	NS	NS	NS	<.01
Self-rated health						
Excellent/good	17%	29%	5%	5%	5%	29%
Fair or poor	32%	50%	18%	16%	15%	47%
Chi-square, <i>P</i>	<.001	<.001	<.001	<.001	<.001	<.001
Limitation in activity						
No	15%	25%	4%	5%	4%	27%
Yes	34%	53%	18%	14%	15%	47%
Chi-square, <i>P</i>	<.001	<.001	<.001	<.001	<.001	<.001
Chronic conditions						
None or 1	16%	23%	3%	3%	4%	22%
2 or 3	18%	30%	7%	6%	6%	33%
4 or more	29%	50%	17%	15%	13%	46%
Chi-square, <i>P</i>	<.001	<.001	<.001	<.001	<.001	<.001

(continued)

Table 2. Continued

	Need for assistance with transportation, weighted %		Transportation-related outcomes, weighted %			
	Regular transportation—does not drive to health visits	Needed assistance with transportation	Transportation-related missed health visit	Transportation-related unmet health care need	Unmet need for transportation to health visit	Concern about cost of transportation to health visits
Need for specialist care						
No	19%	28%	5%	6%	5%	29%
Yes	24%	44%	14%	10%	12%	41%
Chi-square, <i>P</i>	<.01	<.001	<.001	NS	<.001	<.001
Need for mental health care						
No	19%	29%	5%	6%	5%	29%
Yes	27%	50%	19%	14%	15%	47%
Chi-square, <i>P</i>	<.001	<.001	<.001	<.001	<.001	<.001

Source: 2022 Iowa Medicaid Member Survey. Sample sizes range from 2165 to 2174 due to missing data on the outcome. Data are weighted to account for differential sampling and nonresponse by Medicaid program.

Abbreviations: FPL, federal poverty level; NEMT, non-emergency medical transportation; RUCA, rural-urban commuting area.

cost concerns in the past 6 months. Despite access to transportation services, cost concerns were higher for expansion members with NEMT (37%) and traditional Medicaid members (40%).

Results in [Appendix S2](#) show that, among the subgroup of respondents who reported a need for assistance with transportation to health care in the past 6 months, transportation-related missed health visits were still lower for expansion members without NEMT than the other 2 groups and cost concerns were still lower for expansion members without NEMT than traditional Medicaid members.

Lower education and income, unemployment, and reporting worse health or more health care need were consistently related to having transportation-related barriers to care ([Table 2](#)). For example, nearly half of respondents with activity limitations reported transportation cost concerns (47%) and rates of reporting a missed health visit due to transportation were more than 3 times higher for those with compared with those without limitation (18% vs 4%) as were unmet needs for transportation (15% vs 4%). Additionally, Black respondents were more likely to not drive themselves and report a transportation-related missed health visit.

Adjusted logistic regression

In multivariable analyses, the demographic and health characteristics of the population were significantly more important predictors of transportation barriers and access to care than whether respondents had the NEMT benefit ([Table 3](#)). Very few differences between Medicaid groups remained after adjusting for demographic and health differences. Expansion members with NEMT still had a small 6.7 percentage point (95% CI: 0.5, 13.0) higher probability of need for transportation assistance than expansion members without NEMT, and traditional Medicaid members were less likely to not drive themselves to health visits. There were no differences among groups for any transportation-related outcomes, except for cost concerns, which remained 9.6 percentage points (95% CI: 4.4, 14.8) higher for traditional Medicaid members compared with expansion members without NEMT.

Analyses (data not shown) revealed that health and health care need factors explained most of the differences in transportation-related barriers between expansion members without NEMT and those with NEMT, while sociodemographic factors

explained more of the differences between expansion without NEMT and traditional Medicaid members.

Education, income, employment, and health and health care need factors remained significant predictors of transportation barriers. For example, those with a 4-year degree or more vs no high school diploma had a lower probability of needing transportation assistance (−17.2 percentage points; 95% CI: −25.3, −9.0), transportation-related missed health visits (−7.8 percentage points; 95% CI: −12.9, −2.6), and unmet transportation need (−6.0 percentage points; 95% CI: −11.0, −1.1).

For respondents with 4 or more chronic conditions vs those with none or 1, there was a higher probability of needing transportation assistance (11.7 percentage points; 95% CI: 5.5, 17.8), transportation-related missed appointments (4.9 percentage points; 95% CI: 1.3, 8.5), unmet health care needs (6.6 percentage points; 95% CI: 2.8, 10.5), and transportation-related cost concerns (11.1 percentage points; 95% CI: 4.9, 17.3). Black respondents also had more than 13 percentage points higher likelihood of not driving themselves and needing transportation assistance and a 6.7 percentage point (95% CI: 0.6, 12.7) higher likelihood of missed appointments due to transportation.

Discussion

As critical as transportation is for accessing health care, this study demonstrates the complexity of communicating and implementing transportation policies to a Medicaid population. Only 26% of expansion members with NEMT and 19% of traditional Medicaid members were aware of their transportation benefit. Similarly, a recent survey of US Medicaid recipients found that 29% reported awareness of their NEMT benefit.²⁴ Focus group studies in different states also indicate low rates of awareness.¹³ With regard to use, only 9% of expansion members with NEMT and 3% of traditional Medicaid members reported using NEMT services over the previous 6-month period. Nationwide, administrative data for 2021 revealed that less than 4% of US Medicaid recipients used NEMT services.²⁵ Process evaluations in Iowa and other states suggest many issues interfering with recipient uptake of NEMT, such as long call center wait times, need to schedule rides well in advance, long commutes, ride no-shows, and hassles signing up or proving need if necessary.^{13,26-28} Hassles

Table 3. Results of logistic regression models predicting transportation-related barriers to care among Iowa Medicaid-enrolled adults in the past 6 months.

	Transportation-related outcomes, percentage point difference (95% CI)				
	Need for assistance with transportation, percentage point difference (95% CI)		Transportation-related		
	Regular transportation — does not drive to health visits	Needed assistance with transportation	Transportation-related missed health visit	Transportation-related unmet health care need	Unmet need for transportation to health visit
Medicaid group					
Expansion-no NEMT	Ref.	Ref.	Ref.	Ref.	Ref.
Expansion w/NEMT	4.2 (−1.7, 10.0)	6.7 (0.5, 13.0)*	2.8 (−0.8, 6.4)	−1.7 (−5.2, 1.7)	−0.5 (−3.9, 2.9)
Traditional Medicaid	−8.7 (−12.5, −4.8)***	3.1 (−1.9, 8.1)	2.7 (−0.3, 5.7)	−1.5 (−4.2, 1.2)	−0.6 (−3.2, 2.1)
Race/ethnicity					
White	Ref.	Ref.	Ref.	Ref.	Ref.
Black	13.5 (5.8, 21.2)***	15.5 (7.8, 23.1)***	6.7 (0.6, 12.7)*	1.7 (−3.0, 6.5)	2.5 (−2.1, 7.2)
Hispanic	0.8 (−6.0, 7.6)	4.8 (−2.7, 12.3)	−1.1 (−5.1, 3.0)	−2.4 (−6.0, 1.2)	−2.0 (−5.4, 1.4)
Multiple race/other	6.7 (−1.2, 14.6)	6.8 (−1.9, 15.4)	5.7 (−0.9, 12.3)	6.9 (−0.1, 13.9)	3.1 (−2.7, 8.9)
Age					
19–34 y	Ref.	Ref.	Ref.	Ref.	Ref.
35–54 y	−4.6 (−8.7, −0.6)*	−4.3 (−8.7, 0.2)	1.5 (−1.0, 4.1)	0.7 (−2.1, 3.5)	−0.4 (−3.0, 2.1)
55–65 y	−3.7 (−8.7, 1.4)	−4.6 (−10.4, 1.2)	−0.5 (−3.9, 2.9)	−2.2 (−5.7, 1.2)	−0.1 (−3.7, 3.5)
Education					
Less than high school diploma	Ref.	Ref.	Ref.	Ref.	Ref.
High school diploma	−10.4 (−17.1, −3.8)**	−11.0 (−18.2, −3.8)**	−3.0 (−8.0, 2.0)	−0.9 (−5.3, 3.5)	−1.9 (−6.7, 2.9)
Some college	−14.0 (−20.9, −7.2)***	−13.2 (−20.4, −5.9)***	−5.2 (−10.2, −0.1)*	−0.9 (−5.4, 3.6)	−4.0 (−8.8, 0.7)
4-y degree or more	−18.3 (−25.8, −10.8)***	−17.2 (−25.3, −9.0)***	−7.8 (−12.9, −2.6)**	−3.2 (−8.2, 1.8)	−6.0 (−11.0, −1.1)*
Residence (RUCA)					
Rural	Ref.	Ref.	Ref.	Ref.	Ref.
Suburban/large town	4.7 (−0.0, 9.3)	2.4 (−3.1, 7.9)	−0.3 (−3.4, 2.9)	0.8 (−2.5, 4.1)	1.5 (−1.5, 4.5)
Urban	3.0 (−1.4, 7.2)	−0.3 (−5.2, 4.6)	0.7 (−2.2, 3.6)	−1.3 (−4.3, 1.6)	2.6 (−0.1, 5.3)
Gender					
Male	Ref.	Ref.	Ref.	Ref.	Ref.
Female	−2.2 (−6.4, 1.9)	−4.4 (−9.3, 0.4)	0.7 (−2.2, 3.6)	0.9 (−1.9, 3.6)	0.4 (−2.4, 3.1)
FPL					
0%–50% FPL	Ref.	Ref.	Ref.	Ref.	Ref.
51%–100% FPL	−7.7 (−12.4, −2.9)**	−5.6 (−11.7, 0.5)	−2.4 (−6.2, 1.4)	−4.8 (−7.8, −1.8)**	−4.5 (−7.5, −1.4)**
101%–138% FPL	−5.6 (−11.4, 0.3)	−4.0 (−11.1, 3.1)	−3.0 (−7.2, 1.2)	−2.4 (−6.8, 2.0)	−5.1 (−8.5, −1.7)**
Employment					
Full-time	Ref.	Ref.	Ref.	Ref.	Ref.
Part-time	6.5 (2.3, 10.7)**	14.8 (9.6, 20.0)***	2.5 (−0.5, 5.6)	2.0 (−0.9, 4.8)	2.1 (−0.8, 4.9)
Not employed	21.1 (16.7, 25.6)***	22.6 (17.7, 27.5)***	4.9 (2.1, 7.8)**	4.1 (1.3, 7.0)**	4.9 (2.2, 7.6)***
Medicaid enrollment					
6–23 mo	Ref.	Ref.	Ref.	Ref.	Ref.
2–4 y	0.5 (−4.1, 5.0)	−1.2 (−6.7, 4.4)	−1.2 (−4.6, 2.2)	2.2 (−0.9, 5.3)	−0.5 (−3.5, 2.6)
5 y or more	4.9 (−0.1, 9.9)	3.5 (−2.4, 9.3)	−1.2 (−4.7, 2.2)	2.5 (−0.8, 5.8)	1.2 (−2.2, 4.6)
Self-rated health					
Excellent/good	Ref.	Ref.	Ref.	Ref.	Ref.
Fair or poor	3.5 (−1.0, 7.9)	2.8 (−2.2, 7.8)	3.2 (0.4, 6.0)*	4.3 (1.1, 7.4)**	3.6 (0.7, 6.6)*

(continued)

Table 3. Continued

	Need for assistance with transportation, percentage point difference (95% CI)		Transportation-related outcomes, percentage point difference (95% CI)			
	Regular transportation — does not drive to health visits	Needed assistance with transportation	Transportation-related missed health visit	Transportation-related unmet health care need	Unmet need for transportation to health visit	Concern about cost of transportation to health visits
Limitation in activity						
No	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Yes	6.8 (1.9, 11.8)**	10.0 (4.5, 15.5)***	5.1 (2.1, 8.1)**	2.4 (−0.6, 5.3)	3.5 (0.5, 6.5)*	6.6 (1.1, 12.1)*
Chronic conditions						
None or 1	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
2 or 3	0.0 (−4.5, 4.6)	3.1 (−2.0, 8.2)	2.8 (−0.2, 5.9)	2.1 (−0.7, 4.9)	1.5 (−1.7, 4.6)	6.3 (1.1, 11.5)*
4 or more	3.0 (−2.3, 8.3)	11.7 (5.5, 17.8)***	4.9 (1.3, 8.5)**	6.6 (2.8, 10.5)***	2.3 (−1.4, 5.9)	11.1 (4.9, 17.3)***
Need for specialist care						
No	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Yes	0.7 (−3.2, 4.6)	6.7 (2.5, 11.0)**	2.8 (0.2, 5.4)*	−1.1 (−3.8, 1.6)	2.7 (0.1, 5.2)*	4.0 (−0.5, 8.5)
Need for mental health care						
No	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Yes	2.9 (−1.4, 7.2)	8.3 (3.7, 13.0)***	5.5 (2.9, 8.1)**	3.5 (0.7, 6.3)*	4.3 (1.7, 6.9)***	8.7 (3.7, 13.6)***

Source: 2022 Iowa Medicaid Member Survey. Sample size ranges from 2165 to 2174 due to missing data on the outcome. Data are weighted to account for differential sampling and nonresponse by Medicaid program. * $P < .05$, ** $P < .01$, *** $P < .001$.

Abbreviations: FPL, federal poverty level; NEMT, non-emergency medical transportation; Ref, reference; RUCA, rural–urban commuting area.

signing up or using NEMT might, in part, explain why the use of NEMT services was also low even among those aware of their benefit.

Expansion members without NEMT reported significant health care travel concerns. Nearly 1 in 3 had transportation-related cost concerns, 6% reported a missed health visit due to transportation in the past 6 months, and 7% had a transportation-related unmet health care need. In a separate process evaluation, Iowa Medicaid expansion staff highlighted transportation as an important barrier to care for those without NEMT and suggested adding relative reimbursement as an option.²⁹

Overall, however, transportation issues were similar or even higher for recipients with access to the NEMT benefit due to their higher risk factors and low awareness and use of NEMT services. Missed appointments due to transportation were reported for 15% of expansion members with NEMT and 11% of traditional Medicaid members, and approximately 40% of each group had transportation cost concerns. A combination of factors appeared to help explain the higher risk of transportation barriers to care for those with NEMT vs those without, including more health problems and health care need among expansion members with NEMT and more sociodemographic risk for traditional Medicaid members. Findings suggest that the need for non-emergency health care transportation is not being met overall for all Medicaid recipients, leaving this population particularly vulnerable to foregone care from transportation problems and disparities in their ability to access health care services.

Transportation problems were most pronounced for the most vulnerable Medicaid recipients. Approximately half of recipients with activity limitations had transportation cost concerns and nearly 1 in 5 missed appointments due to transportation in a 6-month period. Disruptions in care among individuals with health issues can lead to worsening health and return-on-investment studies indicate substantial cost-savings associated with connecting Medicaid recipients with chronic conditions with NEMT services.^{2,3,5,30} Higher rates of transportation problems and foregone care for Black Medicaid recipients, the unemployed, and those with lower income and education are consistent with what has been found for US adults,^{1,8,9} which suggests that these disparities are also present within Medicaid.

Study findings concerning high rates of transportation problems among Medicaid members with and without the NEMT benefit have several implications for policy. Efforts are needed to raise awareness among Medicaid-enrolled adults about the NEMT benefit. Past studies indicate that most recipients learn about NEMT from social workers, health clinics, and friends/family, suggesting that better communication from Medicaid about the program is needed.¹³ With prior CMS emphasis on addressing social determinants of health in Medicaid, some states implemented social needs screening.^{31,32} This could include a question about the need for transportation assistance along with caseworker follow-up.

Information regarding the prevalence of transportation barriers to care in Medicaid is timely for policy as the Trump administration is less interested in having Medicaid cover services that are not directly related to the provision of health care services. This is particularly evident by the rescission of guidance for states who might have wanted to cover social needs that affect the health status of the population (eg, social determinants of health) as were covered by the Biden administration.

Our findings suggest that there is a sizable proportion of Medicaid recipients who could benefit from transportation services. However, state Medicaid programs should be encouraged to innovate and find better and more efficient ways to deliver these services. Some states have partnered with ride-share services such as Uber and Lyft in an attempt to lower costs while improving patient experience.²⁷ Evidence is mixed, but some studies suggest cost-savings and better primary care and clinical adherence rates among Medicaid recipients offered private rideshare services.^{27,33,34} Options such as relative reimbursement, partnering with local health systems to offer transportation services, and implementing better-quality monitoring of NEMT services could also help improve recipient uptake of NEMT.^{17,27}

Conclusion

Transportation is an important, yet challenging health determinant for all Medicaid members. The value of the NEMT benefit was limited by only one-quarter of Medicaid expansion members with NEMT through medical exemption/age and 1 in 5 traditional Medicaid members knowing about it and higher risk factors in these populations making transportation to health care more challenging overall. All Medicaid eligibility groups could benefit from transportation services, but innovation is needed to determine ways in which NEMT needs can be met in a more effective manner.

Supplementary material

Supplementary material is available at *Health Affairs Scholar* online.

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Conflicts of interest

Please see ICMJE form(s) for author conflicts of interest. These have been provided as supplementary materials.

Notes

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