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<b>FY 2020 Houston EMA Ryan White Part A/MAI Service Definition Medical Transportation (Van Based)</b>	
HRSA Service Category Title: <b>RWGA Only</b>	<b>Medical Transportation</b>
Local Service Category Title:	<b>a. Transportation targeted to Urban b. Transportation targeted to Rural</b>
Budget Type: <b>RWGA Only</b>	<b>Hybrid Fee for Service</b>
Budget Requirements or Restrictions: <b>RWGA Only</b>	<ul style="list-style-type: none"> <li>• Units assigned to Urban Transportation must only be used to transport clients whose residence is in Harris County.</li> <li>• Units assigned to Rural Transportation may only be used to transport clients who reside in Houston EMA/HSDA counties <u>other than</u> Harris County.</li> <li>• Mileage reimbursed for transportation is based on the documented distance in miles from a client's Trip Origin to Trip Destination as <b>documented by a standard Internet-based mapping program (i.e. Google Maps, Map Quest, Yahoo Maps) approved by RWGA.</b> Agency must print out and file in the client record a trip plan from the appropriate Internet-based mapping program that clearly delineates the mileage between Point of Origin and Destination (and reverse for round trips). This requirement is subject to audit by the County.</li> <li>• Transportation to employment, employment training, school, or other activities not directly related to a client's treatment of HIV disease is <u>not</u> allowable. Clients may not be transported to entertainment or social events under this contract.</li> <li>• Taxi vouchers must be made available for documented emergency purposes and to transport a client to a disability hearing, emergency shelter or for a documented medical emergency.</li> <li>• Contractor must reserve 7% of the total budget for Taxi Vouchers.</li> <li>• Maximum monthly utilization of taxi vouchers cannot exceed 14% of the total amount of funding reserved for Taxi Vouchers.</li> <li>• Emergencies warranting the use of Taxi Vouchers include: van service is unavailable due to breakdown, scheduling conflicts or inclement weather or other unanticipated event. A spreadsheet listing client's 11-digit code, age, date of service, number of trips, and reason for emergency should be kept on-site and available for review during Site Visits.</li> <li>• <b>Contractor must provide RWGA a copy of the agreement between Contractor and a licensed taxi vendor by March 30, 2015.</b></li> <li>• All taxi voucher receipts must have the taxi company's name, the driver's name and/or identification number, number of miles driven, destination (to and from), and exact cost of trip. The Contractor will add the client's 11-digit code to the receipt and include all receipts with the monthly Contractor Expense Report (CER).</li> </ul>

	<ul style="list-style-type: none"> <li>• A copy of the taxi company’s statement (on company letterhead) must be included with the monthly CER. Supporting documentation of disbursement payments may be requested with the CER.</li> </ul>
<p>HRSA Service Category Definition: <b>RWGA Only</b></p>	<p><b>Medical transportation services</b> include conveyance services provided, directly or through voucher, to a client so that he or she may access health care services.</p>
<p>Local Service Category Definition:</p>	<p>a. Urban Transportation: Contractor will develop and implement a medical transportation program that provides essential transportation services to <b>HRSA-defined Core Services</b> through the use of individual employee or contract drivers with vehicles/vans to Ryan White Program-eligible individuals residing in Harris County. Clients residing outside of Harris County are ineligible for Urban transportation services. Exceptions to this requirement require <u>prior</u> written approval from RWGA.</p> <p>b. Rural Transportation: Contractor will develop and implement a medical transportation program that provides essential transportation services to <b>HRSA-defined Core Services</b> through the use of individual employee or contract drivers with vehicles/vans to Ryan White Program-eligible individuals residing in Houston EMA/HSDA counties other than Harris County. Clients residing in Harris County are ineligible for this transportation program. Exceptions to this requirement require <u>prior</u> written approval from RWGA.</p> <p>Essential transportation is defined as transportation to public and private outpatient medical care and physician services, substance abuse and mental health services, pharmacies and other services where eligible clients receive Ryan White-defined Core Services and/or medical and health-related care services, including clinical trials, essential to their well-being.</p> <p>The Contractor shall ensure that the transportation program provides taxi vouchers to eligible clients only in the following cases:</p> <ul style="list-style-type: none"> <li>• To access emergency shelter vouchers or to attend social security disability hearings;</li> <li>• Van service is unavailable due to breakdown or inclement weather;</li> <li>• Client’s medical need requires immediate transport;</li> <li>• Scheduling Conflicts.</li> </ul> <p><b>Contractor must provide clear and specific justification (reason) for the use of taxi vouchers and include the documentation in the client’s file for <u>each</u> incident. RWGA must approve supporting documentation for taxi voucher reimbursements.</b></p> <p>For clients living in the METRO service area, written certification from the client’s principal medical provider (e.g. medical case manager or physician) is required to access van-based transportation, to be renewed every 180 days. <b>Medical Certifications should be maintained on-site by the provider in a single file (listed alphabetically by 11-digit code) and will be monitored at least annually during a Site Visit.</b> It is the</p>

	<p>Contractor's responsibility to determine whether a client resides within the METRO service area. Clients who live outside the METRO service area but within Harris County (e.g. Baytown) are not required to provide a written medical certification to access van-based transportation. All clients living in the Metro service area may receive a maximum of 4 non-certified round trips per year (including taxi vouchers). Non-certified trips will be reviewed during the annual Site Visit. Provider must maintain an up-to-date spreadsheet documenting such trips.</p> <p>The Contractor must implement the general transportation program in accordance with the Transportation Standards of Care that include entering all transportation services into the Centralized Patient Care Data Management System (CPCDMS) and providing eligible children with transportation services to Core Services appointments. Only actual mileage (documented per the selected Internet mapping program) transporting eligible clients from Origin to Destination will be reimbursed under this contract. The Contractor must make reasonable effort to ensure that routes are designed in the most efficient manner possible to minimize actual client time in vehicles.</p>
Target Population (age, gender, geographic, race, ethnicity, etc.):	<p>a. Urban Transportation: HIV/AIDS-infected and Ryan White Part A/B eligible affected individuals residing in Harris County.</p> <p>b. Rural Transportation: HIV/AIDS-infected and Ryan White Part A/B eligible affected individuals residing in Fort Bend, Waller, Walker, Montgomery, Austin, Colorado, Liberty, Chambers and Wharton Counties.</p>
Services to be Provided:	<p>To provide Medical Transportation services to access Ryan White Program defined <b>Core Services</b> for eligible individuals. Transportation will include round trips to single destinations and round trips to multiple destinations. Taxi vouchers will be provided to eligible clients only for identified emergency situations. Caregiver must be allowed to accompany the HIV-infected rider. <b>Eligibility for Transportation Services is determined by the client's County of residence as documented in the CPCDMS.</b></p>
Service Unit Definition(s): <b>RWGA Only</b>	<p>One (1) unit of service = one (1) mile driven with an eligible client as passenger. Client cancellations and/or no-shows are <u>not</u> reimbursable.</p>
Financial Eligibility:	<p>Refer to the RWPC's approved <i>Financial Eligibility for Houston EMA/HSDA Services</i>.</p>
Client Eligibility:	<p>a. Urban Transportation: Only individuals diagnosed with HIV/AIDS and Ryan White Program eligible HIV-affected individuals residing inside Harris County will be eligible for services.</p> <p>b. Rural Transportation: Only individuals diagnosed with HIV/AIDS and Ryan White Program eligible HIV-affected individuals residing in Houston EMA/HSDA Counties other than Harris County are eligible for Rural Transportation services.</p> <p>Documentation of the client's eligibility in accordance with approved</p>

	<p>Transportation Standards of Care must be obtained by the Contractor prior to providing services. The Contractor must ensure that eligible clients have a signed consent for transportation services, client rights and responsibilities prior to the commencement of services.</p> <p>Affected significant others may accompany an HIV-infected person as medically necessary (minor children may accompany their caregiver as necessary). Ryan White Part A/B eligible affected individuals may utilize the services under this contract for travel to Core Services when the aforementioned criteria are met and the use of the service is directly related to a person with HIV infection. An example of an eligible transportation encounter by an affected individual is transportation to a Professional Counseling appointment.</p>
Agency Requirements	<p>Proposer must be a Certified Medicaid Transportation Provider. Contractor must furnish such documentation to Harris County upon request from Ryan White Grant Administration prior to March 1<sup>st</sup> annually. Contractor must maintain such certification throughout the term of the contract. Failure to maintain certification as a Medicaid Transportation provider may result in termination of contract.</p> <p>Contractor must provide each client with a written explanation of contractor's scheduling procedures upon initiation of their first transportation service, and annually thereafter. Contractor must provide RWGA with a copy of their scheduling procedures by March 30, 2014, and thereafter within 5 business days of any revisions.</p> <p><b>Contractor must also have the following equipment dedicated to the general transportation program:</b></p> <ul style="list-style-type: none"> <li>• A separate phone line from their main number so that clients can access transportation services during the hours of 7:00 a.m. to 10:00 p.m. directly at no cost to the clients. <b>The telephone line must be managed by a live person between the hours of 8:00 a.m. – 5:00 p.m.</b> Telephone calls to an answering machine utilized after 5:00 p.m. must be returned by 9:00 a.m. the following business day.</li> <li>• A fax machine with a dedicated line.</li> <li>• All equipment identified in the Transportation Standards of Care necessary to transport children in vehicles.</li> <li>• Contractor must assure clients eligible for Medicaid transportation are billed to Medicaid. This is subject to audit by the County.</li> </ul> <p>The Contractor is responsible for maintaining documentation to evidence that drivers providing services have a valid Texas Driver's License and have completed a State approved "Safe Driving" course. Contractor must maintain documentation of the automobile liability insurance of each vehicle utilized by the program as required by state law. All vehicles must have a current Texas State Inspection. The minimum acceptable limit of automobile liability insurance is \$300,000.00 combined single limit. Agency must maintain detailed records of mileage driven and names of</p>

	<p>individuals provided with transportation, as well as origin and destination of trips. <b><i>It is the Contractor's responsibility to verify the County in which clients reside in.</i></b></p>
<p>Staff Requirements</p>	<p>A picture identification of each driver must be posted in the vehicle utilized to transport clients. Criminal background checks must be performed on all direct service transportation personnel prior to transporting any clients. Drivers must have annual proof of a safe driving record, which shall include history of tickets, DWI/DUI, or other traffic violations. Conviction on more than three (3) moving violations within the past year will disqualify the driver. Conviction of one (1) DWI/DUI within the past three (3) years will disqualify the driver.</p>
<p>Special Requirements: <b>RWGA Only</b></p>	<p>Individuals who qualify for transportation services through Medicaid are not eligible for these transportation services.</p> <p><b>Contractor must ensure the following criteria are met for all clients transported by Contractor's transportation program:</b></p> <p>Transportation Provider must ensure that clients use transportation services for an appropriate purpose through one of the following three methods:</p> <ol style="list-style-type: none"> <li>1. Follow-up hard copy verification between transportation provider and Destination Agency (DA) program confirming use of eligible service(s), or</li> <li>2. Client provides receipt documenting use of eligible services at Destination Agency on the date of transportation, or</li> <li>3. Scheduling of transportation services was made by receiving agency's case manager or transportation coordinator.</li> </ol> <p>The verification/receipt form must at a minimum include all elements listed below:</p> <ul style="list-style-type: none"> <li>• Be on Destination Agency letterhead</li> <li>• Date/Time</li> <li>• CPCDMS client code</li> <li>• Name and signature of Destination Agency staff member who attended to client (e.g. case manager, clinician, physician, nurse)</li> <li>• Destination Agency date stamp to ensure DA issued form.</li> </ul>

***FY 2022 RWPC “How to Best Meet the Need” Decision Process***

<b>Step in Process: Council</b>		Date: <b>06/10/2021</b>
Recommendations:	Approved: Y: _____ No: _____ Approved With Changes: _____	If approved with changes list changes below:
1.		
2.		
3.		
<b>Step in Process: Steering Committee</b>		Date: <b>06/03/2021</b>
Recommendations:	Approved: Y: _____ No: _____ Approved With Changes: _____	If approved with changes list changes below:
1.		
2.		
3.		
<b>Step in Process: Quality Improvement Committee</b>		Date: <b>05/18/2021</b>
Recommendations:	Approved: Y: _____ No: _____ Approved With Changes: _____	If approved with changes list changes below:
3.		
2.		
3.		
<b>Step in Process: HTBMTN Workgroup #3</b>		Date: <b>04/21/2021</b>
Recommendations:	Financial Eligibility:	
1.		
2.		
3.		

**FY 2019 PERFORMANCE MEASURES**  
**RYAN WHITE GRANT ADMINISTRATION**  
**HARRIS COUNTY PUBLIC HEALTH (HCPH)**

Ryan White Part A  
HIV Performance Measures  
FY 2019 Report

**Transportation**  
All Providers

<b>Van-Based Transportation</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>Change</b>
A minimum of 70% of clients will utilize Parts A/B/C/D primary care services after accessing Van Transportation services	491 (63.7%)	550 (68.6%)	<b>4.9%</b>
55% of clients will utilize Parts A/B LPAP services after accessing Van Transportation services	417 (54.1%)	455 (56.7%)	<b>2.6%</b>

<b>Bus Pass Transportation</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>Change</b>
A minimum of 50% of clients will utilize Parts A/B/C/D primary care services after accessing Bus Pass services	926 (34.8%)	908 (36.6%)	<b>1.8%</b>
A minimum of 20% of clients will utilize Parts A/B LPAP services after accessing Bus Pass services	591 (22.2%)	534 (21.5%)	<b>-0.7%</b>
A minimum of 85% of clients will utilize any RW Part A/B/C/D or State Services service after accessing Bus Pass services	2,013 (75.6%)	1,941 (78.2%)	<b>2.6%</b>



# Industry-Informed Perspectives on the Benefits of Rideshare-Based Medical Transportation

Megan Callahan, MPH; Nicole Cooper, DrPH, MPH; Jennifer Sisto Gall, MPH; and Justin Yoo, BA

The recent article “Rideshare Transportation to Health Care: Evidence From a Medicaid Implementation” examined the association between utilization of rideshare-based nonemergency medical transportation (R-NEMT) among Medicaid beneficiaries and self-reported metrics of ride quality and late or failed passenger pickups.<sup>1</sup> The authors reported findings that higher values of rideshare trips as a proportion of total trips were not associated with perceptions of ride quality but were associated with reports of more frequent late and failed pickups.

The finding suggesting a negative relationship between R-NEMT utilization and health care access is not reflective of Lyft’s experience providing Medicaid beneficiaries with access to transportation over the past 5 years. Indeed, around the country we have consistently observed meaningful positive outcomes as a result of R-NEMT. Previous studies have found that R-NEMT utilization is associated with fewer missed primary care appointments, shorter average wait times, and a higher rate of on-time pickup compared with other modes of NEMT.<sup>2,3</sup>

Lyft appreciates the authors’ addition to the emerging literature on R-NEMT. However, the study by Eisenberg et al suffers from a number of limitations that raise concerns about both external and internal validity.

Critically, large national rideshare companies were not included in the study design, heavily limiting the generalizability of the study findings. Based on internal and market-level data, Lyft maintains that neither Lyft nor any other major or national ridesharing company was operating in the study setting during the study period. Lyft and similar companies are large national providers of NEMT services in Medicaid, and their omission causes any generalization of study findings to rideshare as a class to be inappropriate and misleading.

Further, the rideshare entity involved in this study is a particularly poor proxy for national rideshare companies like Lyft. Although the authors do not name the state that was the object of study, the only Northwestern state employing a statewide broker model between 2016 and 2018 was the state of Idaho. During this time Idaho was under contract with a broker employing a *rideshare-like model*, which operates differently from national rideshare companies. Lyft has a nationwide rideshare presence and an existing network of drivers

that can launch seamlessly in new NEMT markets. However, in Idaho, the broker was a new entrant to the local market, and a new supply of drivers had to be recruited to meet existing demand. This *de novo* ramp-up period, which would not be required by a scaled, national rideshare company like Lyft, could have contributed to the access issues reported in the study.

In addition to the issue of low generalizability, the study has key methodological limitations that raise concerns about internal validity. One major limitation is the lack of trip-level outcome data. In this study, the authors examine not the association between an R-NEMT trip and outcomes, but rather the association between the proportion of R-NEMT trips and outcomes, with both defined at the level of a Medicaid beneficiary. This design that aggregates data to the individual level puts the study at risk of ecological fallacy. In other words, there is no way to know if a given outcome came from an R-NEMT trip or from a trip that involved another mode of NEMT. This is of particular concern for the failed pickups outcome, where even 1 failure may be enough for an individual to agree with the statement, “The driver often failed to pick me up for a medical appointment.” By aggregating data to the individual level, the study obscures the true relationship between R-NEMT utilization and outcomes and could even mask a trip-level association that is in the opposite direction of the individual-level association.

Additional issues further complicate the interpretability of the findings. The study contrasts use of R-NEMT with use of nonrideshare NEMT, but users of these 2 modes may not be comparable. For instance, nonrideshare NEMT includes transportation provided by a variety of vehicle types, such as ambulatory vehicles and wheelchair-accessible vehicles (WAVs). The assignment of a beneficiary to a WAV is unlikely to be random and is likely informed by varying rider needs. Although the authors attempted to adjust for these potential differences, sample sizes for some covariates were too small for substantive subanalyses.

The defined levels within the variables of interest also pose problems. For the independent variable, the levels are defined as no R-NEMT trips, some R-NEMT trips (< 50%), and many R-NEMT trips (≥ 50%). However, this scheme would group together someone

who received 1 of 2 rides using R-NEMT with someone who received 299 of 300 rides using R-NEMT, although these scenarios reflect 2 very different realities. Although the authors attempt to adjust for the number of total trips, this variable cannot be treated as a confounder, and including it in the model specification does not address fundamental issues with study design.

In summary, significant methodological limitations and the very model of transportation studied raise concerns about the internal and external validity of study findings. Findings from research performed by academics and Lyft's health care partners suggest that rideshare can have a major positive impact on health care access and utilization. More high-quality research is needed to assess the impacts of R-NEMT on health care access for Medicaid beneficiaries, particularly given recent increases in R-NEMT utilization, as well as technological and operational improvements in the sector. ■

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**Author Disclosures:** Ms Callahan, Dr Cooper, and Ms Sisto Gall are employees of Lyft, a transportation network company whose perspectives are represented in this manuscript, and are shareholders of Lyft stock. Mr Yoo is a contracted employee of Lyft.

**Authorship Information:** Concept and design (MC, NC, JSG); drafting of the manuscript (MC, NC, JSG, JY); critical revision of the manuscript for important intellectual content (MC, NC, JSG, JY); administrative, technical, or logistic support (JY); and supervision (MC, NC, JSG).

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2. Chaiyachati KH, Hubbard RA, Yeager A, et al. Rideshare-based medical transportation for Medicaid patients and primary care show rates: a difference-in-difference analysis of a pilot program. *J Gen Intern Med.* 2018;33(6):863-868. doi:10.1007/s11606-018-4306-0
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# Reply to “Industry-Informed Perspectives on the Benefits of Rideshare-Based Medical Transportation”

Yochai Eisenberg, PhD; Randall Owen, PhD; and Caitlin Crabb, PhD

**W**e appreciate the opportunity to address Lyft's concerns with our study on rideshare-based nonemergency medical transportation (R-NEMT). Our study found that a higher proportion of rideshare trips was not associated with ride quality but was associated with reporting late and failed pickups—potentially affecting health care access.<sup>1</sup> Lyft's letter criticizes our methodology and internal/external validity, which we will address here. It is important to note that although we studied a program with similarities to Lyft, Lyft was not involved. Overall, readers should recognize that our study was conducted within the scope of evaluation research using the best data and measures available, while noting its limitations. Moreover, our article appears to have achieved one of its primary goals: to contribute to a dearth of published literature on R-NEMT and promote discussion on the topic.

Lyft indicates that its experience and previous studies have found a positive relationship with R-NEMT and health care access. Indeed, our article highlights extant findings but also cites the mixed results in peer-reviewed literature and a limited number of studies reporting outcomes. One study cited by Lyft found fewer missed primary care appointments among R-NEMT compared with usual care.<sup>2</sup> However, when scaled up to a larger study, R-NEMT was not associated with fewer missed appointments.<sup>3</sup> The other source cited in Lyft's letter was a short blog post, which lacks crucial information, including methods and measures, to assess the validity of the findings.<sup>4</sup>

Lyft's letter implies that our findings lack external validity because the program was not administered by a large national rideshare company and is therefore not representative. An alternative view is that these evaluation findings add a valuable perspective: Not all R-NEMT is provided by large

## LETTER TO THE EDITOR

national companies, so we should not dismiss research on R-NEMT implementation within smaller rideshare companies.

Another concern was the absence of trip-level outcome data, a valuable component of specific trip analysis; however, data required for such an analysis were unavailable. Rather, we focused on perceptions of ride quality and access as part of a statewide NEMT evaluation. Our study employed a survey using common measures of perceptions in transportation and health care literature.<sup>5</sup> Importantly, we described in our paper<sup>1</sup> how such perceptions may be associated with an individual's willingness to use NEMT. We argue that it is not only the individual-trip experiences that affect perceptions but also the cumulative experiences of the NEMT service. This is not a case of ecological fallacy but a difference in research aims.

Lyft's letter suggests that it was inappropriate to compare consumers who use R-NEMT and traditional NEMT because some may have different needs. Yet, our study accounts for many of those needs by including factors such as age, mobility, and developmental disabilities. We also note that 29% of the people who use manual wheelchairs or powerchairs did have at least 1 rideshare trip, suggesting that excluding them from the analysis (as indicated by Lyft) is not appropriate. Additionally, Lyft suggests that the R-NEMT categories we used in our analysis were too coarse and that our attempt to control for potential confounding using "total trips" was insufficient. We disagree: "Total trips" is a valuable confounder that controls for frequency of rides. Additionally, we ran models (not shown here) with a continuous variable instead of the R-NEMT categories and found similar results.

High-quality R-NEMT research is needed. We call on rideshare companies and state Medicaid agencies contracting

with them to facilitate experimentation through independent research evaluations. Specifically, there is a need for longitudinal research that employs randomized controlled trial or quasi-experimental design. Nonetheless, there is value in nonexperimental cross-sectional designs, especially to inform this burgeoning area of R-NEMT evaluation. ■

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## Non-Emergency Medical Transportation in the Time of COVID-19

COMMENTARY *(The RAND Blog)*



A rideshare driver wears gloves and a mask while driving following the outbreak of COVID-19, in New York City, March 15, 2020

Photo by Jeenah Moon/Reuters

by [Laura Fraade-Blanar](#) and [Christopher M. Whaley](#)

May 5, 2020

**D**uring normal times, over [3.6 million Americans](#) miss or delay medical care due to transportation barriers. Non-Emergency Medical Transportation (NEMT), transportation to medical appointments, pharmacies, lab visits, and other types of routine care for the transportation-disadvantaged, aims to reduce this barrier.

During the current pandemic, movement has slowed as people shelter in place. Traditional NEMT options have narrowed or disappeared as public transportation and paratransit stop or operate at reduced schedules, and family and neighbors become less willing to provide transit (lest the infection spread, as occurred in [New Rochelle](#), New York, where an ill individual infected the neighbor providing transportation to the hospital). Still, people have to obtain non-emergency but necessary medical care, including kidney dialysis, chemotherapy, and prenatal care visits.

Transportation problems are often cited as a barrier to [receiving care and medical compliance](#). NEMT, covered by

Medicaid and certain Medicare Advantage plans, [is associated](#) with greater use of preventive and primary health care, lower use of emergency services and inpatient services, and timely medical care among certain health conditions. These services continue to be needed during a pandemic, especially among the chronically ill, [a group](#) which may already face greater transportation barriers than the general public.

Reduced transportation options create almost impossible dilemmas. For highly vulnerable populations, like older adults living independently, using public transportation-NEMT involves either risking potential infection to travel to the places they need to go, or possibly risking other adverse health outcomes by not traveling to necessary medical care. Other NEMT options, such as family or friends driving, ambulances or “handivans” picking up individuals, become difficult in a pandemic as resources become scarce and people isolate themselves by necessity.

Transportation Network Companies (TNCs) like Lyft and Uber have been providing NEMT, since [2016](#) and [2018](#) respectively, through a ride-share model. Generally, the service has yielded positive results; [studies found](#) patients using rideshare-based NEMT had fewer missed primary care appointments, a lower average wait time, a higher rate of on-time pickup compared to those using other types of NEMT, and lower costs.

While other forms of transportation become increasingly unavailable due to quarantine, lack of access to public transit, or reserving transit for emergencies such as ambulances reserved for transferring COVID-19 patients, TNCs may be uniquely suited to current needs. With high scalability and an existing service model available, rideshare could address transportation needs.

TNCs can do more than just provide NEMT during the current crisis. They can deliver ([and as of April 15th](#) are delivering) food to individuals in medical quarantine or who are unable to safely shop for themselves, supplementing existing grocery delivery services who are currently overwhelmed. They can also deliver goods from open stores, such as pharmacy items, including sanitizing materials, non-prescription drugs, and personal care products.

Making ridesharing a workable option in the current crisis requires local and state government cooperation, TNC capacity, clarity around the rideshare driver’s role, and protection for the driver.

First, TNCs must be able to provide NEMT within the state. Some states were unable to allow TNCs to provide NEMT because of historical barriers, driver requirements, or other obstacles. Currently, [at least 10 states](#) include rideshare as a NEMT provider. If the ranks of Medicaid swell due to an economic downturn, there may be greater need for NEMT. With state and local government cooperation, the range of services rideshare drivers could provide and the number of drivers available are limited only by what is safe for the driver and logistically feasible. This could include an expanded service into remote, rural areas.

Second, the TNC must have the logistical capabilities to provide NEMT to transportation-vulnerable Medicare and Medicaid recipients. The TNC must be able to work within the state statutes on NEMT, and within the state dictated operating model, such as working with health plans, transportation brokers, and/or state agencies to coordinate service. Beyond current services, TNCs deliver customer-purchased groceries and goods. Delivering goods rather than people has the additional benefit of not exposing drivers to potentially infectious but asymptomatic customers.

Third, drivers must be protected during the current pandemic. If rideshare drivers are going to continue to work, everyone, from the TNCs to the customers, must ensure this remains a safe occupation. Lyft and Uber have issued guidance to their drivers around safe operations, including disinfecting the in-vehicle environment and not driving when ill. Both are working to distribute [cleaning supplies](#) to drivers. Some drivers have [erected](#) a do-it-yourself, see-through barrier between the rear and front seats. Both TNCs have suspended [pooled](#) rides. Both offer [financial](#)

With government cooperation, the range of services rideshare drivers could provide and the number of drivers available are limited only by what is safe for the driver and logistically feasible.

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[assistance](#) to drivers self-quarantining with a doctor's note. Such efforts could be necessary if rideshare drivers and TNCs are going to be depended upon to provide essential services at this time. If PPE supplies were sufficient to satisfy the needs of medical providers, rideshare drivers, as public-facing essential personnel, may be appropriate recipients of masks.

Finally, making rideshare-based NEMT a workable option requires a firm understanding of what rideshare drivers and TNCs can and cannot do. Although drivers for TNCs could be asked to deliver goods to and between medical facilities, they cannot move medical samples or soiled supplies between medical facilities. Similarly, drivers cannot be used to transport patients with suspected or confirmed COVID-19, based on [CDC guidance](#). Patients need to be advised that if they have [confirmed or suspected COVID-19 and are seeking help or are experiencing a medical emergency](#), rideshares are not the right transportation option. Although drivers can bring a transportation-vulnerable individual to a pharmacy anywhere across the country, they don't have scaled capabilities to pick up the prescription and deliver it to the individual's home. Drivers receive no formal medical training. Rideshare-based NEMT currently works best for those who are physically and cognitively healthy enough to use curb-to-curb rather than door-to-door service.

Changes are already occurring in isolated circumstances. [At least three states](#) removed regulatory barriers to allow rideshares to provide NEMT in the last few weeks, some using the [1135 waivers \(PDF\)](#) under the Stafford Act to exercise greater flexibility. Pilot programs allowing medication pickup by rideshares are underway, supplementing existing efforts by Doordash, Postmates, and Deliv. Door-to-door service involving light assistance from the driver is being explored under other new pilots. [Lyft](#) is delivering meals to students who normally received subsidized school meals, and to senior citizens. They also recently started [delivering](#) groceries, medical supplies, and necessary goods to [medically vulnerable or transportation-disadvantaged recipients](#) on behalf of nonprofits, government agencies, and health care organizations. [Uber](#) has pledged free rides [and free meals](#) for health care providers internationally.

More widespread availability of rideshare for NEMT may save lives, reserve emergency resources for those who need them, and provide safe pathways to primary care for the chronically ill. It may also save livelihoods, providing employment in a time of economic hardship. Rideshares cannot offer everything, but there are things that could be done to support rideshare in doing the one thing their drivers do very well: move people and things to where they need to be.

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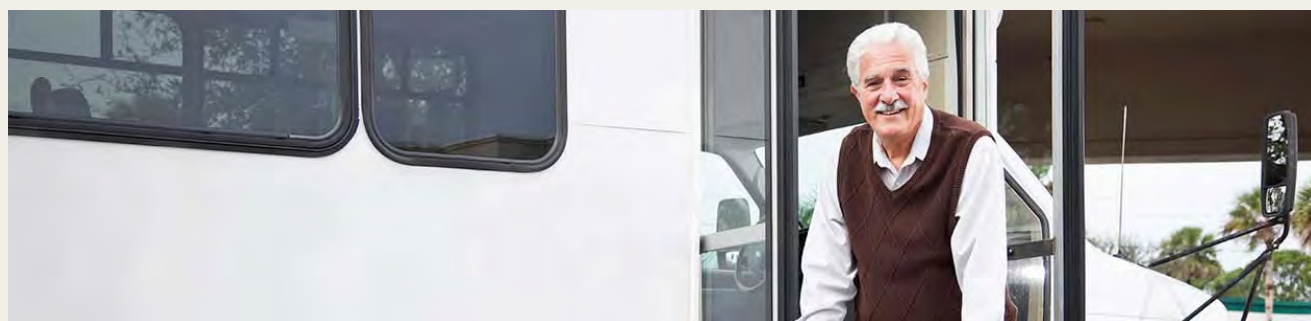
## ABOUT

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## Improving Health Care through Transportation



Most healthcare news in 2020 has been focused, rightfully, on coronavirus disease (COVID-19). Meanwhile, many routine or non-emergency health care procedures have been postponed, and as these procedures make their way back onto our personal schedules, it's worth remembering that many people delay non-emergency but necessary medical procedures all the time for many different reasons. It should come as no surprise that transportation is one of these.

Successful partnerships between transportation and health care organizations are one way to overcome the transportation-related health challenges in communities. Innovative case studies along these lines are part of the TRB Transit Cooperative Research Program's (TCRP) [Guidebook and Research Plan to Help Communities Improve Transportation to Health Care Services](#). The pre-publication report also provides a research plan that outlines future research needs and priorities to better understand the complex relationship between transportation and health care.

In regards to finding the most appropriate solution for each individual's transportation needs, "both health care providers and transportation providers are capable of getting it right," says the TCRP report's principal investigator Ken Hosen, Vice President of KFH Group.

"It often takes a leader with a vision to initiate and pursue a partnership between the community's transportation provider and the health care sector," adds coauthor Buffy Ellis, Senior Transportation Planner at KFH Group. She cited examples in the case studies where one person was able to make a noticeable difference in driving these collaborative projects forward.

In Michigan, Texas, and Oregon, transportation agencies of various sizes have formed partnerships to offer options—including a model similar to ride-hailing services—to provide greater mobility. These include same-day trips and fixed route bus tickets, as well as ADA paratransit and Medicaid non-emergency medical transportation (NEMT).

In Colorado and Missouri, however, medical systems themselves have taken on the responsibility of coordinating or providing NEMT with similar methods like subscriptions, fixed route bus, vouchers, and using Lyft for on-demand trips for hospital discharges.

Social [isolation and loneliness](#) are serious yet underappreciated public health risks that affect a significant portion of the older adult population. A National Academies of Sciences, Engineering, and Medicine report recommends a similar approach to the TCRP Guidebook. When health care providers, organizations, and systems partner with social service providers, an effective team-based network of care can be created. This partnership allows community-based services to address social isolation and loneliness in older adults. A deeper look at the transportation aspects surrounding this issue will appear in the January/February 2021 issue of TRB's journal, *TR News*.

To further understand the models available for providing NEMT for Medicaid beneficiaries, TCRP's [Handbook for Examining the Effects of Non-Emergency Medical Transportation Brokerages on Transportation Coordination](#) explores options for states. NEMT coordination with public transit and human services transportation is highly dependent on the policies and priorities of Medicaid agencies in each state.

### **Transportation Access to Healthcare is a Major Equity Issue**

In looking at further research needs at the intersection of health and transportation, the need for improved access to health care has become even more startlingly clear with the coronavirus pandemic. People living in communities with poor air quality and those in minority population groups seem to be more at risk for the disease. TCRP's handbook asks whether transportation access to health care is a factor contributing to disparities.

“We already knew that transportation access could be improved in many of the communities COVID-19 has hit the hardest. It was still startling to see how much impact the virus had in communities already struggling with social determinants of health,” says Ellis.

There is room for improvement between some of the largest agencies funding and coordinating transportation access to health care, but entities like the Federal Transportation Agency's Coordinating Council on Access and Mobility are working to improve opportunities for coordinating funding streams, say the coauthors.



Five complementary activities can facilitate the [integration of social care into health care](#) per a report from the National Academies of Sciences, Engineering, and Medicine. These activities, awareness, adjustment, assistance, alignment, and advocacy each have a transportation-related example clearly outlined in the report. The report recommends integrating these activities along with a workforce, digital infrastructure, financing, and further research to potentially improve health and reduce health disparities. Transportation has a role to place in each of these support structures.

### **Targeting Specific Health Care Transportation Challenges**

For example, missed and shortened dialysis treatments lead to negative health outcomes, such as increased hospitalizations. For public transportation agencies, dialysis transportation has become a critical concern, as increasing numbers of individuals with end-stage renal disease turn to their community's public transit service for their required three roundtrips each week to access their dialysis clinic. TCRP's report, [Dialysis Transportation: The Intersection of Transportation and Healthcare](#), responds to major concerns of public transportation agencies about the rising demand and costs to provide kidney dialysis trips and about experiences showing these trips require service more specialized than public transportation is designed to provide.

An [article published in TR News](#) on a National Academies of Sciences, Engineering, and Medicine workshop highlighted transportation as related to community health and climate issues. One session tied active transportation and infrastructure to rates of obesity and diabetes in communities. Another noted strategies to address asthma by reducing traffic and levels of particulate matter.

The TRB Airport Cooperative Research Program (ACRP) pulled together experts in 2018 for a two-day event exploring the potential for [airports to reduce the transmission of communicable disease](#). Speakers from the Centers for Disease Control, international airports, and various local departments of health met with attendees from the public, private, and academic sectors to identify challenges, resources, and lessons learned.

When a vaccine for COVID-19 is approved and ready for distribution, [transportation will play a role](#) in ensuring equitable vaccine allocation.

### **Tools Are Ready to Measure Transportation to Health Care**

Leveraging transportation projects to support positive health outcomes was further examined at a [TRB webinar](#) based on the TRB National Cooperative Highway Research Program's (NCHRP) [Research Roadmap for Transportation and Public Health](#). The 10-year strategic Roadmap offers a plan for funding research through the 2020s that can lead to greater consideration of health issues in transportation contexts. Tools for implementing such plans are also available.

Earlier this year, another [TRB webinar](#) explored how the federal government and state departments of transportation are researching and considering the health impacts of transportation investments. The presenters also addressed planning decisions, including how programming analyses and design considerations can encompass more than air emissions, noise, and water quality.

The tools and data sources for health-related transportation needs were discussed in depth at a TRB workshop in June 2016. Participants also shared information on collaboration in urban, suburban, and rural settings as well as the return on investment for these programs at [Exploring Data and Metrics of Value at the Intersection of Health Care and Transportation](#).

A study published in *Transportation Research Record* (TRR) confirms that in Canada, spatial accessibility is positively associated with the likelihood of consultations. Results show that living in a census tract with higher spatial accessibility correlates with an increase in an individual's odds of consultation with a health care professional at a hospital. The study controlled for factors of need and predisposition.

### Staying prepared with TRB and the National Academies

In April 2020, TRB convened several thought leaders in transportation to develop a research agenda to assist research funding agencies in prioritization of activities and funding around COVID-19's impact on transportation. The [resulting summary](#) looks at all modes—both passenger and goods movement—so that research initiated as the situation unfolds can take advantage of immediate lessons learned.

Enabling scientists, engineers, entrepreneurs, health leaders, and policymakers to work together will help to comprehensively address the health challenges of people as they age. The National Academy of Medicine's [Healthy Longevity Global Grand Challenge](#) is a worldwide movement to do so through an evidence-based report as well as a Global Competition. The competition is open to innovators of any background and is a multiyear, multi-million-dollar international competition to accelerate breakthroughs in healthy longevity.

TRB has a long history in advancing best practices in integrating transportation and health goals, as told through a [Centennial Paper](#) on the topic.

There is plenty of work still to be done and we want to hear from you. Look for [ongoing information](#) on new projects, requests for proposals, or to nominate yourself or others to serve on a project panel. Submit problem statement research ideas and find new announcements in [TRB's weekly newsletter](#) or on the homepages for [ACRP](#), [NCHRP](#), and [TCRP](#).

You can also become a friend of one of TRB's standing committees working on transportation security, the [Standing Committee on Transportation and Public Health](#). However you chose to get involved will pay off for both your community and transportation research at large.

**TRB reports cited in this article:**

- [NCHRP Research Results Digest 393: Selected Indirect Benefits of State Investment in Public Transportation](#)
- [NCHRP Research Report 932: A Research Roadmap for Transportation and Public Health](#)
- [TCRP Research Report 202: Handbook for Examining the Effects of Non-Emergency Medical Transportation Brokerages on Transportation Coordination](#)
- [TCRP Research Report 203: Dialysis Transportation: The Intersection of Transportation and Healthcare](#)

**Articles published in TRR:**

- [Spatial Access by Public Transport and Likelihood of Healthcare Consultations at Hospitals,](#)

**Articles published in \*TR News\*:**

- [Protecting the Health and Well-Being of Communities in a Changing Climate](#)

**Additional TRB resources:**

- [Transportation Research Circular E-C267: Summary of Transportation Research Needs Related to COVID-19](#)
- [TCRP Web-Only Document 29: Cost-Benefit Analysis of Providing Non-Emergency Medical Transportation](#)
- TRB Snap Search on [Transportation & Health](#)
- [Transportation's Roles in Equitable Vaccine Allocation](#) blog
- [Centennial Paper on Public Health and Transportation](#)

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## RESEARCH ARTICLE

## Open Access

# Innovative health care mobility services in the US



Mary K. Wolfe\*  and Noreen C. McDonald

## Abstract

**Background:** Transportation barriers prevent millions of people from accessing health care each year. Health policy innovations such as shared savings payment models (commonly used in accountable care organizations) present financial incentives for providers to offer patient transportation to medical care. Meanwhile, ridesourcing companies like Uber and Lyft have entered the market to capture a significant share of spending on non-emergency health care transportation. Our research examines the current landscape of innovative health care mobility services in the US.

**Methods:** We conducted an environmental scan to identify case examples of utilization of ridesourcing technology to facilitate non-emergency health care transportation and developed a typology of innovative health care mobility services. The scan used a keyword-based search of news publications with inductive analysis. For each instance identified, we abstracted key information including: stakeholders, launch date, transportation provider, location/ service area, payment/booking method, target population, level of service, and any documented outcomes.

**Results:** We discovered 53 cases of innovation and among them we identified three core types of innovation or collaboration. The first and most common type of innovation is when a health care provider leverages ridesourcing technology to book patient trips. This involves both established and nascent transportation companies tailoring the ridesourcing experience to the health care industry by adding HIPAA-compliance to the booking process. The second type of innovation involves an insurer or health plan formally partnering with a ridesourcing company to expand transportation offerings to beneficiaries or offer these services for the first time. The third type of innovation is when a paratransit provider partners with a ridesourcing company; these cases cite increased flexibility and reliability of ridesourcing services compared to traditional paratransit.

**Conclusions:** Ridesourcing options are becoming a part of the mode choice set for patients through formal partnerships between ridesourcing companies, health care providers, insurers, and transit agencies. The on-demand nature of rides, booking flexibility, and integration of ride requests and payment options via electronic medical records appear to be the strongest drivers of this innovation.

**Keywords:** Access to health care, Health care transportation, Shared mobility, Non-emergency medical transportation, NEMT, Ridesourcing, Ridehailing, TNCs

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## Background

### Access to health care

Health care transportation refers to any transportation to medical facilities that is non-emergency in nature (e.g. to medical appointments, to an urgent care facility, or being discharged from the hospital). When patients have access to routine and preventative care, overall health outcomes are improved and costly ambulance bills or emergency department visits can be avoided. Delays in medical treatment can lead to progression of chronic disease and ultimately, poorer health outcomes and excessive use of resources [1]. In a recent study, we estimated that 5.8 million people in the US delayed non-emergency medical care due to lack of transportation in 2017 [2].

A systematic review concluded that transportation barriers are a significant impediment to health care access, especially for people with lower incomes or those who are underinsured or uninsured. Such barriers often include lack of access to a vehicle [3]. Neighborhoods with access to public transportation commonly rely on aging transportation infrastructure, unreliable service, or fixed routes that do not align with the location of health care facilities. In many cases, riding the bus or the subway can be physically challenging for people with disabilities, chronic illness, or obesity.

The US has seen a proliferation and normalization of shared mobility technology in recent years; it is estimated that 36% of Americans used some form of ride-sourcing service in 2018 [4]. There is federal recognition of the swiftly evolving landscape of shared mobility as transit agencies grapple with opportunities presented by these technological advancements. The US Department of Transportation has sponsored research and pilot projects aimed at exploring partnerships between transit and shared mobility providers [5, 6]. Ridesourcing companies like Uber and Lyft have entered the market to capture a significant share of current spending on non-emergency health care transportation [7] and health care providers are leveraging shared mobility services to establish new ways for patients to access on-demand rides to and from medical appointments.

This paper examines the current landscape of these innovative health care mobility services. We first describe the policy environment in which innovation is occurring. We then illustrate and catalog mobility services by key features and provide specific case examples of hospitals, health systems, and paratransit providers who are leveraging ridesourcing technology to improve service delivery of health care transportation.

### Traditional provision of health care transportation

For many people, driving oneself, getting a ride from a friend or family member, taking public transportation, or ordering a taxi are viable modal options to travel to

health care facilities and medical appointments. For individuals with mobility- or financial-related barriers, such as lack of a personal vehicle, there are various specialized transportation options for such trips. We describe several of these alternatives here.

*Paratransit*, in the broadest sense, refers to flexibly scheduled and flexibly routed passenger transportation that supplements fixed-route systems run by public transit agencies. The 1990 Americans with Disabilities Act (ADA) requires that transit operators provide accessible paratransit service (often called 'ADA complementary'). While paratransit services are commonly perceived as a dedicated service for elderly riders and riders with disabilities, a range of paratransit services exists serving all rider types. Paratransit serves a number of trip purposes, with health care-related trips among them. In many cases, the service is funded by 5310 and 5311 formula grants, which are transportation funding opportunities passed from federal to state to local governments with the aim of reducing operational and capitals costs of transit providers. Paratransit can be provided by both public transportation agencies and other (private or not-for-profit) entities. Paratransit modes can include demand-responsive buses, van services, hospital and care provider-based shuttles, and vehicles for hire including livery vehicles and taxis.

Beyond paying for one's own health care transportation, there are various programs to help pay for the cost of these trips. *Medicaid non-emergency medical transportation (NEMT)* is a Medicaid benefit that facilitates access to and from medical services for beneficiaries who have no means of transportation, or who need accommodations for physical or intellectual disabilities. Since its inception in 1966, Medicaid pays for NEMT services using the most appropriate and least costly form of transportation. Through this required benefit, states purchase hundreds of millions of rides from taxis, livery vehicles, vans, ambulettes, and public transit every year. Although comprehensive data about Medicaid NEMT expenditures do not exist because states are not required to separately report on this item, the Transit Cooperative Research Program estimates NEMT spending at \$3 billion annually, which is less than 1% of total Medicaid expenditures [8].

The majority of states have evolved to deliver NEMT through NEMT brokers or managed care organizations (MCOs). In most of these states, the broker or MCO receives a per capita payment to manage the NEMT benefit.<sup>1</sup> A few states directly fund government entities such

<sup>1</sup>Capitation is a payment arrangement for health care service providers; Medicaid pays the broker or MCO a set amount for each enrolled beneficiary assigned to them, per period of time, whether or not that person seeks care

as departments of transportation to provide NEMT while others deliver NEMT on a fee-for-service basis through local service providers. Some jurisdictions provide gas cards or bus passes to beneficiaries. Administration of NEMT services is a significant logistical undertaking for state Medicaid programs.

Beyond Medicaid, health care transportation is becoming more prevalent in other federal programs and health insurance markets. Traditional Medicare covers NEMT via ambulance only<sup>2</sup>; however, NEMT has become a popular supplemental benefit in the *Medicare Advantage (MA)* program. In 2016, NEMT was available to roughly 25% of MA's 19 million enrollees [9]. In May 2018, the Centers for Medicare & Medicaid Services issued a final rule on a new policy as part of a broad 2019 Medicare payment rule that gives MA plans greater flexibility in choosing supplemental benefits offered to enrollees with chronic illness; nonmedical benefits can include ride-sourcing services. In 2019, about 22 million Americans were enrolled in MA plans, which was slightly greater than one third of all Medicare beneficiaries [10].

The *US Department of Veterans Affairs (VA)* offers mileage reimbursement and transportation services for travel to medical and rehabilitation appointments for veterans with disabilities who meet at least one of their qualifying criteria. The VA's Veterans Transportation Program offers travel solutions to and from VA health care facilities at little or no cost to eligible veterans.

In 2010, the Patient Protection and Affordable Care Act brought about comprehensive health care reform including provisions and programs to test and expand new models of delivering and paying for care, such as the creation of *accountable care organizations (ACOs)*. Under the ACO concept, health care providers are organized into teams that together are responsible for the health of a given patient population and the cost of providing its care. ACOs receive bonuses for meeting quality and cost targets while in some cases incurring penalties for falling short of targets. Some ACOs provide beneficiaries with transportation, recognizing that it is one of many strategies to address social needs that have an impact on health, commonly referred to as social determinants of health.

*Charitable support* is also an important supplier of health care transportation in many communities. Community volunteer services, such as those organized through faith-based groups, often provide assistance through a supply of volunteer drivers. Large not-for-profit organizations also offer funding for transportation to care, such as CancerCare, an organization that provides financial assistance for treatment-related

transportation to people affected by cancer. In some cases, hospitals and other care facilities have ad-hoc, charity-based funds to facilitate transportation.

#### Dynamic policy context

Important policy shifts have occurred which directly (and indirectly) shape the context in which people seek out transportation to health care. Several health care delivery system reforms of the Affordable Care Act were mentioned above; here we will briefly discuss amendments to the Anti-Kickback statute as well as Medicaid waivers.

Effective January 2017, the Department of Health and Human Services and the Office of Inspector General issued a federal Safe Harbor ruling, changing the system of the provision of medical transportation [11]. Prior to this, the Anti-Kickback Statute, originally enacted by the Office of Inspector General in 1972, stated that no health care provider or institution receiving federal dollars could offer anything of financial value that may increase referrals for their publicly- or privately-insured patients; these "inducements" yielded criminal penalties and substantial fines. This criminal statute was intended to protect patients and federal health care programs from fraud and abuse. The 2017 ruling amended this statute by adding new safe harbors that protect certain payment practices and business arrangements from sanctions, making it permissible for eligible medical providers—including hospitals, clinics, physician's offices, dialysis clinics, medical laboratories, and physical therapists—to offer or facilitate transportation for established patients.

By providing protection for health care entities from penalties related to a possible conflict of interest should they want to include medical transportation as part of their benefit package, the Safe Harbor ruling opened the door for various entities to get involved in medical transportation without fear of legal repercussions. With this change, overall volume of medical trips may increase due to the fact that health care providers can now offer transportation to members who are not covered by Medicaid and who previously did not receive a transportation benefit. Health care providers can contract with taxi companies, mobility companies, or provide transportation in-house.

Another relevant policy shift relates to how the federal government and some states have been reexamining the Medicaid NEMT benefit [12]. As mentioned above, NEMT is a mandatory benefit for Medicaid beneficiaries; however, since 2017 states can limit its availability through federal waivers as Medicaid enters a period of experimentation and potentially reduced federal resources [13]. These Section 1115 Medicaid demonstration waivers allow states to test new approaches in Medicaid that differ from federal program rules. While state Medicaid Agencies navigate decisions about

<sup>2</sup>and only when other means of transportation, such as a taxi or wheelchair van, would jeopardize the health of the beneficiary

Medicaid waivers, there is evidence to support that NEMT is a worthwhile investment. The state of Florida commissioned an independent evaluation of its NEMT program and found that every dollar invested in the services saved \$11.08 in avoidable hospitalization costs, which is equal to a return on investment of more than 1100% [14].

## Methods

This research documents the current landscape of innovation in health care transportation services. The aim of our study was to identify examples of ways in which new ridesourcing services are changing existing modes of access to medical care and providing new ways for patients to reach health care facilities. We used publicly available and subscription search engines to locate news-based sources describing instances in which ridesourcing technology is being leveraged by an institution to facilitate health care transportation in the US.

We identified innovative examples of ridesourcing use in health care transportation by conducting an environmental scan. Environmental scans originated in business but are increasingly used in public health research; they are used to gather knowledge and identify shifts related to social, economic, and technological contexts [15]. Researchers have conducted environmental scans to identify innovations in decision-making training programs for health professionals [16, 17]; to evaluate the landscape of health care access quality measurement [18]; and to examine electronic consultation services between primary care providers and specialists available worldwide [19]. Environmental scans leverage some of the key features of systematic review protocol, including clearly-defined search parameters and predetermined inclusion criteria, and are well-suited for emerging topics where the academic literature is not well-developed enough to support a systematic review.

## Terminology

Shared mobility refers to any mode, whether bicycle, car, public transit, or other mode, in which shared use by multiple users (concurrent or sequential) is often facilitated by smartphone apps and technology [20]. Ridesourcing, or ridehailing, has become one of the most recognized forms of shared mobility. Ridesourcing companies, or Transportation Network Companies (TNCs), such as Uber and Lyft, are defined for regulatory purposes as companies that use an online-enabled platform to connect passengers with drivers who use their personal, non-commercial vehicle to provide trips [21]. We use the term “innovative” in this scan to describe a departure from traditional provision of health care transportation (as described earlier).

## Search strategy

We employed a keyword-based search of news articles, news transcripts, web-based publications, and press releases published from January 1, 2005 to January 31, 2018 to identify innovative case examples in the US in which ridesourcing technology was utilized to connect patients to trips in a vehicle for non-emergency medical purposes. Our search parameters were: (ridehailing OR ridesourcing OR TNC OR Uber OR Lyft) AND (health OR medical OR NEMT) AND (transportation AND health AND medical). These terms were used to search Google News and LexisNexis. We utilized a search feature that excluded duplicates in the display of results.

## Case selection & evidence synthesis

For each article identified, we reviewed the title to determine relevance. We then reviewed each relevant article in full according to our inclusion criteria: case examples in the US in which ridesourcing technology was utilized to connect patients to trips in a vehicle for non-emergency medical purposes. From articles that reported on cases meeting these inclusion criteria, we selected specific cases with the most complete reporting of information and abstracted the following characteristics: key stakeholders involved, launch date, transportation provider, location and service area, who pays for service, booking method, payment method, target population, level of service, and any documented outcomes of the service thus far.

We qualitatively analyzed this information to create a typology of innovative health care mobility services. Specifically, we examined the key stakeholders and booking method of each case to discern important differences and similarities among cases. Understanding who is involved in the ride arrangement and who, specifically, books the ride in each case was the most effective way to analyze the case examples. This process was iterative and followed an inductive approach; we identified patterns, resemblances, and regularities across cases to generate our final typology.

## Results

Our search yielded 3321 publications. We excluded industry trade press publications ( $n = 2293$ ) and blogs ( $n = 491$ ) leaving 537 publications. After reviewing newswires and press releases ( $n = 224$ ), news transcripts ( $n = 207$ ), newspapers ( $n = 74$ ), and other web-based publications ( $n = 32$ ), we discovered 53 cases that met our inclusion criteria (i.e. case examples in the US in which ridesourcing technology was utilized to connect patients to trips in a vehicle for non-emergency medical purposes). After analysis, we identified three core types of innovation: 1) When a health care provider leverages ridesourcing technology; 2) When an insurer partners with a TNC;

and 3) When a paratransit provider partners with a TNC. This section describes the structure of each type of innovation and includes an example of each and the typology is summarized in Table 1.

#### Type I: health care provider leverages ridesourcing technology

The first type of innovation is when a health care provider leverages ridesourcing technology to book patient trips. This was the most common type of innovation we found and it primarily involves transportation companies tailoring the ridesourcing experience to the health care industry. The critical feature of this innovation is the added HIPAA compliance of the booking process. Health care associates can order rides for patients from new and existing ridesourcing services through a HIPAA-compliant web platform. Access to this platform occurs through digital integration of a web tool built into a provider's existing system or as a third-party platform. This allows for the transportation booking process to be digitally integrated with electronic medical records (EMRs) while safeguarding protected health information and maintaining HIPAA compliance. These centralized transportation booking platforms, or dashboards, allow providers to track patients' trips, record billing and spending information, and send patient reminders to a mobile or landline. Importantly, providers can schedule rides on behalf of patients, which is most essential for patients without a smartphone. As the most common type of innovation we identified, the level of formality of these arrangements varied. In some cases, hospitals simply posted a Lyft discount code in the discharge area while in other cases, a full-scale business line was launched, as was the case with Uber Health.

#### Example of type I: Uber health

After an eight-month trial with 100 health care providers that tested the ridesourcing service, Uber launched its new business line, Uber Health, in March 2018. Branded as a "HIPAA-compliant technology solution," Uber Health provides a ridesourcing platform available specifically to health care providers, allowing clinics and hospitals to book rides for patients from a centralized dashboard. A health care associate inputs the name of the patient, a pick-up and drop-off location, and a phone number. The client then receives a text message or call with trip information at the time of booking and again when a driver is on the way. Rides can also be booked by clients with just a landline; they can be scheduled minutes before an appointment, or days in advance.

Uber Health stores all trip information in client-side, HIPAA-compliant servers, so organizations are able to view and export records for billing and reporting. Access to the Uber Health dashboard and reporting tools are free; Uber Health bills health care organizations directly for the cost of individual rides based on the same rate as rides on the standard consumer app. Uber has also created an open application programming interface so developers can build the service into their existing patient management software or health information technology systems.

#### Type II: insurer partners with TNC

The second type of innovation we identified is when an insurer partners with a ridesourcing company. This is when a health plan or insurance company formally partners with an existing ridesourcing service(s) to expand transportation services available to beneficiaries or offer these transportation benefits for the first time. While examples of this type were limited, it is likely that this type

**Table 1** Typology of Innovative Health Care Mobility Services

	<i>Type I</i>	<i>Type II</i>	<i>Type III</i>
	Health care provider leverages TNC technology	Insurer partners with TNC	Paratransit provider partners with TNC
<b>Who books the ride?</b>	Clinician (on patient's behalf); patient	Patient or clinician	Usually the rider/patient
<b>Who pays?</b>	Health care provider; broker; patient	Insurance company; health plan	Transit agency; patient pays 'fare' with substantial subsidy from transit agency
<b>Eligible for Medicaid reimbursement?</b>	Varies; in many cases, yes, given patient eligibility	n/a	Yes, given patient eligibility
<b>Patient Benefits:</b>	<ul style="list-style-type: none"> <li>• Shorter wait times &amp; less uncertainty</li> <li>• Reminders through smartphone or analog phone</li> </ul>	<ul style="list-style-type: none"> <li>• Financial support</li> <li>• Addresses social determinant of health</li> </ul>	<ul style="list-style-type: none"> <li>• Flexible booking circumvents need for advance booking</li> <li>• Increased trip reliability</li> <li>• Patients who otherwise can't afford TNC service have access</li> </ul>
<b>Health Care Provider Benefits:</b>	<ul style="list-style-type: none"> <li>• Real-time tracking patients' trips as well as own spending</li> <li>• Flexible booking</li> </ul>	<ul style="list-style-type: none"> <li>• Greater patient engagement</li> <li>• Reduced costs in long-term</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced appointment no-shows</li> </ul>

Source: authors' own analysis of findings of nationwide scan



of collaboration will become more common as insurers increasingly offer more supplemental, non-medical benefits as a result of a larger shift of the health care industry to value-based care. This is especially likely given the new Medicare Advantage guidelines for 2019 which make it easier for payers to receive compensation for providing a broader array of the supplemental benefits. Notably, this type of innovation reflects insurers' acknowledgement of transportation to care as a social determinant of health.

#### **Examples of type II: Blue Cross and Blue Shield & Lyft; Cigna-HealthSpring & Lyft**

In May 2017 Blue Cross and Blue Shield forged a public-private partnership with Lyft to address transportation challenges of some beneficiaries. Under the partnership, commercial plan members living in 'transportation deserts,' or areas with limited access to reliable transportation, can get a Lyft ride to medical appointments and the hospital at zero cost to them [22]. This offering was extended in 2018 to include rides to and from pharmacies, and further expanded in 2019 to members of certain Blue Cross and Blue Shield MA plans [23].

Also in May 2017, MA provider Cigna-HealthSpring partnered with Lyft to provide beneficiaries rides to physician offices, pharmacies, and health facilities. The service is for MA members in non-emergency situations and is only available to Cigna-HealthSpring customers with plans that have supplemental non-emergent medical transportation benefits through a program called Access2Care. By December 2017 the partnership had provided rides to 14,500 beneficiaries [24].

#### **Type III: Paratransit provider partners with TNC**

The third type of innovation we identified is when a paratransit provider partners with a ridesourcing company. Due to the demand-responsive nature of paratransit provisions (e.g. services do not operate over a fixed schedule like a standard public bus; rather, vehicles are dispatched on request and operate door-to-door), paratransit services have been said to be a sort of progenitor of mobile app-based TNCs [25]. While not all paratransit trips are for health-related purposes, paratransit is especially important for people with disabilities who may have no other mode of reaching health care facilities or medical appointments. Sources that we located reference the increased flexibility and reliability of ridesourcing services compared to traditional paratransit. In most cases we found, transit agencies are subsidizing these trips while in a pilot phase, so long-term viability of these partnerships is unclear.

#### **Examples of type III: Massachusetts Bay Transportation Authority**

A prominent example of this type of collaboration is led by the Massachusetts Bay Transportation Authority's (MBTA) Paratransit service called the "RIDE." Launched in September 2016 and extended three times (most recently through September 2020), the MBTA has been piloting a partnership program with Lyft, Uber, and now Curb, to offer on-demand service to eligible RIDE customers. Customers can enroll in the pilot program and sign up with one of the three TNCs (not multiple). Once enrolled, customers can request rides through Uber and Lyft smartphone apps or by using a call-in service if booking with Lyft or Curb. Riders receive a limited number of subsidized rides each month based on historical RIDE use.

According to MBTA, the maximum subsidy for each trip is currently \$40. Uber and Lyft cover all of the RIDE's regular service area while the newly added Curb service covers a smaller geographic subset of the area. Importantly, Uber, Lyft, and Curb drivers do not provide assistance (e.g. door to door service or help with vehicle boarding) in the same way that they would with the traditional RIDE service, so riders with these needs are encouraged to ride the traditional ADA Complementary Paratransit service [26].

Other regions have incorporated or piloted the use of TNC services for paratransit trips, including Broward Co. Paratransit in Broward County, Florida; Dallas Area Rapid Transit in Dallas, Texas; and RabbitTransit, the Central Pennsylvania Transportation Authority (formerly York Adams Transportation Authority).

#### **Discussion**

In this environmental scan, we encountered various avenues through which innovation in shared mobility is driving the evolution of health care transportation. The on-demand nature of rides and integration of ride requests and electronic medical records (EMRs) appear to be the strongest drivers of this progress. Ridesourcing options are appearing in EMR workflows of clinicians and are becoming a part of the mode choice set for patients through formal partnerships with care providers, insurance companies, and transit agencies. Given the novelty of this type of collaboration, existing research on the topic is sparse. The environmental scan approach allows us to gather knowledge and identify shifts related to rapidly-evolving technological contexts as documented through news-based sources. Inherent to the nature of any keyword-based search strategy, our review is limited by the search terms we imposed and window of time we specified.

Press releases about new partnerships and mission statements on company websites speak of overarching

goals driving this collaboration. Motivations are strong on the care provider side: increasing options for reliable patient transportation means reduction of no-shows and late arrivals, increased treatment adherence, and greater bed turnover as patients are discharged more swiftly. Cost saving potential for insurers is noteworthy; improving adherence to preventive care and maintenance of chronic conditions can reduce unnecessary emergency department visits. For patients, incentives focus largely on convenience. Ridesourcing options allow same-day, reliable access to urgent care and clinic appointments. In some cases, customer out of pocket expenses can be reduced (given the high cost of parking at some care facilities). For patients with physical limitations, ridesourcing services may offer greater freedom in scheduling medical trips; however, the accessibility of TNC vehicles for people with physical and intellectual disabilities remains a significant challenge to be addressed.

With the surge of innovation occurring in this space, there has been limited evaluation of effectiveness of ride-sourcing interventions for medical trips and the evaluations that have occurred show mixed results. A 2017 study by researchers at the University of Kansas found that ambulance utilization decreased by an average of 7% from 2013 to 2015 in cities where UberX had been in operation [27]. A 2018 experiment by Penn Medicine researchers found that offering a free Lyft ride to medical appointments for Medicaid patients did not reduce the rate of missed primary care appointments in Philadelphia [28].

The efficacy of interventions designed to address transportation barriers, as well as interventions to address multiple social determinants of health, needs to be better understood. It is critical to consider whether new health care transportation options are equitable. Shared mobility users tend to be younger, have higher levels of educational attainment, and are less diverse than the general public and shared mobility modes often require access to a smartphone and banking services [29]. While several cases encountered in this scan are implementing avenues of utilization outside of traditional smartphone apps (e.g. dial-in options from a landline), further considerations should be explored to understand the reach of these services for various patient populations. Given the uncertainty around the future of TNC-based partnerships, research is needed to define best practices for collaborative management of these programs and to earnestly explore policies surrounding cross-sectoral data sharing feasibility.

## Conclusion

The fast pace of growth and innovation in the health care transportation sector reflects the longstanding need

for progress in this area. With an aging baby boomer population, it is likely that the population of people reliant on external transportation provision to health care facilities will grow. The realization that transportation barriers to health care access are often preventable has dovetailed with the proliferation and familiarization of shared mobility technology in the US. Shared mobility can provide a viable option for populations with specific needs or barriers (e.g., older adults) and will likely continue its transformative impact on transportation access broadly [30].

Important shifts in health care delivery have contributed to creating an environment ripe for change. Movement towards value-based arrangements in the health care market, redistribution of financial risk of care, and new protection from sanctions for providing certain health-related services have made it permissible, and even judicious, for health care providers to offer or facilitate transportation for established patients.

Health care transportation, like the rest of the health care industry, is moving increasingly into the digital age. As patient medical records are progressively relocating online in the form of EMRs, so too are patient transportation arrangements shifting to web-based platforms. The findings from this scan are evidence that the benefits of connecting patients with on-demand rides to health care facilities through ridesourcing technology is deemed worth the potential risk of data breach or privacy concerns commonly associated with smart technologies. Continued innovation in this space must balance the goal of increased accessibility while prioritizing the protection of patient information.

Innovative health care mobility services aim to slow the chain reaction of missed appointments that trigger increased emergency room visits, extended hospital readmissions, higher overall costs, and poorer health outcomes. While new partnerships and companies continue to emerge in health care mobility services, it is critical for both health care providers and transportation providers to evaluate these offerings to ensure that they are accessible to the most vulnerable patient populations.

## Abbreviations

(ACOs): Accountable care organizations; (ADA): Americans with Disabilities Act; (EMRs): Electronic medical records; (MCOs): Managed care organizations; (MA): Medicare Advantage; (NEMT): Non-emergency medical transportation; (TNC): Transportation network company; (VA) (VA): U.S. Department of Veterans Affairs.

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## Authors' contributions

Both M.W. and N.M. conceived of the idea and approach for the scan. M.W. gathered the data and wrote the initial manuscript. Both authors contributed

to data analysis and manuscript revisions and both authors have read and approved the final manuscript. N.M. supervised the project.

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#### Availability of data and materials

The dataset used and/or analyzed during the current study are available from the corresponding author on reasonable request.

#### Ethics approval and consent to participate

Not applicable.

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Not applicable.

#### Competing interests

The authors declare that they have no competing interests.

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# Rideshare Transportation to Health Care: Evidence From a Medicaid Implementation

Yochai Eisenberg, PhD; Randall Owen, PhD; Caitlin Crabb, PhD; and Miguel Morales, MPH

One substantial barrier to accessing health care is the lack of consistent transportation.<sup>1-3</sup> Transportation challenges to health care are disproportionately experienced by individuals who are low-income, older adults, non-White, women, and less educated, many of whom are Medicaid enrollees.<sup>4</sup> An estimated 25% to 55% of Medicaid enrollees missed, arrived late to, or did not try to go to a health care appointment because of transportation issues.<sup>5-7</sup> Adults and children who missed medical appointments due to transportation issues had extensive comorbidities and a significantly higher prevalence of health conditions compared with those who missed care for other reasons.<sup>4</sup> Inconsistent care due to transportation challenges can negatively affect health and increase preventable emergency department visits, particularly for individuals with chronic conditions.<sup>8,9</sup>

Nonemergency medical transportation (NEMT) is a mandatory benefit provided through Medicaid to travel to and from health care appointments.<sup>10</sup> NEMT is provided by nonmedical personnel through a range of vehicles, including wheelchair-accessible vans.<sup>8</sup> The most common model of NEMT administration is through a third-party broker and/or managed care organization (MCO), in which the broker or MCO receives capitated payments by the state to broker, coordinate, manage, and/or administer NEMT.<sup>11,12</sup>

Despite historical support for NEMT, this program is particularly susceptible to service and funding cuts. Some states have used Section 1115 waivers to exclude Medicaid expansion populations from NEMT benefits.<sup>13</sup> CMS drafted a proposed rule that would allow states more flexibility in providing NEMT,<sup>14</sup> and the current administration's budget proposals for fiscal years 2019 and 2020 proposed making NEMT an optional benefit.<sup>15</sup> The rule could reduce patient access to NEMT and, subsequently, to needed medical services. This tension reflects the demands inherent in the Triple Aim of health care—cost, quality, and access<sup>16</sup>: It is extremely challenging to reduce NEMT costs without affecting quality and access or to improve quality without raising costs. It is important to consider how quality and access are affected by new cost-reducing models in NEMT.

Rideshare-based medical transportation (RMT) is a program in which NEMT is provided by drivers using their personal vehicles,

## ABSTRACT

**OBJECTIVES:** Some managed care companies are testing rideshare services as an approach to providing transportation to health care for Medicaid enrollees. The objective of this study was to assess whether more rideshare transportation to health care was associated with improved self-reported ride experiences and fewer late/failed passenger pickups for Medicaid enrollees.

**STUDY DESIGN:** We surveyed a random sample of Medicaid enrollees in a northwestern US state on their experiences with nonemergency medical transportation (NEMT) in the past year. We linked survey responses to administrative data on NEMT utilization from the state's transportation broker to obtain an objective measure of rideshare utilization.

**METHODS:** We used bivariate tests and multivariable logistic regressions to examine associations between enrollee perspectives on the quality of and access to health care and rideshare use, defined as none, some, or many NEMT trips through rideshare services.

**RESULTS:** More than 35% of respondents received NEMT from rideshare services at least once. Perceptions of the ride experience, driver, and vehicle did not differ based on the proportion of rideshare trips received. Having more rideshare trips was associated with reporting late and failed pickups. In multivariable regression, the statistical significance held for failed pickups. Sensitivity analyses showed similar results.

**CONCLUSIONS:** This study suggests that rideshare to health care programs can meet similar goals of quality compared with traditional NEMT services but may have implications for health care access for Medicaid enrollees. Future evaluations need to include the perspectives of enrollees and explore potential differences among different Medicaid subpopulations.

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similar to rideshare companies like Uber and Lyft. RMT can be combined with traditional NEMT to also provide rides via prearranged vans or taxis. RMT is appealing because it may provide more flexibility for passengers; is well suited for last-minute rides, like hospital discharges; and may reduce wait times and cost.<sup>8</sup> Additionally, RMT can better track rides and collect data, potentially addressing quality, fraud, waste, and abuse.<sup>8</sup>

Conversely, critiques of RMT include lower pay for drivers, lack of access in rural areas, inadequate driver screening, and safety issues for drivers and riders.<sup>17,18</sup> Because the NEMT population is more likely to be low-income, older adults, and individuals with disabilities,<sup>4</sup> additional specialized training for drivers is needed. Ridesharing companies not specific to NEMT have also faced criticism and even legal action for a lack of accessibility for individuals with disabilities.<sup>19,20</sup> Rideshare vehicles are typically not equipped to provide rides to those using wheelchairs/scooters.

Some early evaluations of RMT implementation suggest mixed results regarding health care access and service quality. Preliminary results from pilot tests suggested that RMT leads to decreased missed appointments<sup>21</sup> and high safety and satisfaction ratings (> 95%).<sup>22</sup> However, recent studies contradict these pilots. A randomized controlled trial found no significant effect of RMT on missed appointments.<sup>23</sup> A recent analysis of Twitter posts suggested that passengers had overwhelmingly negative experiences with rideshare drivers.<sup>24</sup> Based on Andersen's conceptual model of health care access,<sup>25</sup> perceptions of the ride experience, driver, and vehicle appropriateness may affect individuals' willingness to use NEMT. It is important to understand consumers' perceptions of RMT because perceptions likely influence NEMT service utilization and overall access to health care.

In this paper, our aim was to determine whether RMT was associated with users' perceptions of quality and access to care. In a northwestern state in the United States, the Medicaid transportation broker included rideshare services as part of its NEMT. Unlike typical rideshare services, there was no passenger-side smartphone app; the rides were requested on behalf of the passenger directly from the NEMT broker (ie, passengers may not have known whether or not they received a rideshare driver). In this way, the passenger did not change their usual practice for scheduling rides. Enrollees' trips were simply assigned to RMT or traditional NEMT based on availability of rideshare drivers and origin/destination. Thus, factors that affect a patient's willingness and ability to use ridesharing and the associated smartphone app did not confound our analysis.

We assessed whether having a greater proportion of rides from rideshare drivers was associated with greater satisfaction and better access to care. To our knowledge, no other studies have examined the association between rideshare use and passenger perspectives through a systematic independent evaluation controlling for

## TAKEAWAY POINTS

Ridesharing is an understudied service delivery method deployed by managed care organizations for nonemergency medical transportation (NEMT) for Medicaid enrollees. Our study found that:

- ▶ Perceptions of ride quality were not affected by the proportion of ridesharing trips, indicating that ridesharing within NEMT can maintain goals of quality like traditional NEMT.
- ▶ Having more rideshare trips was associated with greater odds of failed pickups, which affects access to health care for Medicaid enrollees.
- ▶ Managed care organizations and transportation brokers seeking to use ridesharing should systematically evaluate patient-reported measures of ride quality and access to care to understand the impacts of ridesharing.

multiple potential confounding factors. We examined the following research questions: (1) Was receiving more rides through RMT associated with a higher quality of service (vehicle appropriateness, safety, and cleanliness)? and (2) Was receiving more rides through RMT associated with a lower likelihood of reporting late and/or failed pickups?

## METHODS

We obtained administrative data on all NEMT rides from the NEMT broker's administrative database for the years 2016 to 2018. To assess the experiences of NEMT users, we developed a survey that was distributed to a stratified random sample of individuals eligible for Medicaid NEMT within the state. The questionnaire included 29 questions that covered transportation utilization, access, experiences, satisfaction, and demographics. Many survey questions were drawn from standard Consumer Assessment of Healthcare Providers and Systems surveys, a national standardized survey tool developed by the Agency for Healthcare Research and Quality.<sup>26</sup>

### Sampling

We employed proportionate stratified random sampling to ensure that perspectives from a variety of groups were included in the survey. We stratified sampling based on having a legal guardian (for those younger than 18 years and those with a developmental disability), prior NEMT utilization, and county of residence. Based on a power analysis, we estimated that a sample of 1101 was needed. Surveys were distributed to the selected enrollees through the mail at least twice. Up to 3 telephone reminders were made, with the option to complete the survey over the telephone. If requested, the survey and accompanying materials were available in Spanish.

Overall, the response rate was 28.3%, consistent with other Medicaid mail surveys.<sup>27,28</sup> Compared with nonresponders, responders were older (mean age, 43 vs 35 years), took more NEMT trips (median number of trips, 38 vs 21), and had a lower proportion with a legal guardian (23.3% vs 46.0%) (eAppendix Table 1 [eAppendix available at [ajmc.com](http://ajmc.com)]). The differences were not a threat to internal validity because we were primarily interested in responses for enrollees who had taken NEMT.

## POLICY

**TABLE 1.** Sample Characteristics of a Sample of Medicaid Enrollees (N = 266)

Variable	Mean (SD) or median (IQR)
Age in years (continuous), mean (SD) <sup>a</sup>	42.9 (20.6)
Total NEMT trips, median (IQR)	34.5 (6-110)
	n (%)
Demographic factors	
Age in years (categorical)	
< 18	39 (14.7)
18-64	184 (69.2)
≥ 65	43 (16.2)
Male gender	99 (38.8)
White race	189 (71.1)
Missing response to race items	30 (11.3)
Latino ethnicity	34 (12.8)
On Medicaid DD waiver	49 (18.4)
Mobility disability	117 (44.0)
NEMT use	
Proportion of RMT trips (categorical)	
No RMT trips (0)	172 (64.7)
Some RMT trips (<50%)	46 (17.3)
Many RMT trips (≥50%)	48 (18.0)
Ride experience	
Low frequency of medical appointments	79 (30.9)
≥31 minutes to get to primary care provider's facility	55 (21.5)
The vehicle was often appropriate to meet your transportation needs.	197 (87.9)
The driver was often polite and courteous.	209 (89.7)
I often felt safe when riding with a transportation driver.	205 (87.6)
The vehicle was often clean.	204 (87.9)
The vehicle was often in good mechanical repair.	194 (84.3)
The driver was often late to pick me up to or from an appointment. <sup>a</sup>	69 (30.0)
The driver often failed to pick me up for a medical appointment.	105 (50.2)

DD, developmental disability; IQR, interquartile range; NEMT, nonemergency medical transportation; RMT, rideshare-based medical transportation.

<sup>a</sup>Reverse coded for consistency.

## Variables

**Dependent variables.** The dependent variables were responses to 7 questions related to transportation quality and access (eAppendix Table 2). For most questions, responses were dichotomized into usually/always and never/sometimes. For the failed pickup question, the response options were dichotomized into sometimes/usually/always and never, because a failed pickup is a more extreme event that may have a large impact on access to care and acceptability of the service.

**Independent variable of interest.** The transportation broker provided a data set of one-way trip details for each respondent. We selected all trips made within 1 year of the month that the survey

was received, reflecting the time frame of the survey question wording. For each respondent, we calculated the proportion of total NEMT trips that were provided by a rideshare driver. A categorical variable was coded as “many” for having at least 50% of trips with a rideshare driver, “some” for having 1% to 49%, and “none” for having no rideshare trips. Nonrideshare trips were provided through ambulatory vehicles (sedans), wheelchair-accessible vans, public transportation, and mileage reimbursement. However, 95% of rides came from ambulatory vehicles or wheelchair-accessible vans.

**Covariates.** We included several covariates to control for confounding, including age, sex, race/ethnicity, frequency of health care visits, total NEMT trips (one-way), and trip distance. Through interviews with advocates, we learned that RMT was not working well for the population with developmental disability (DD), so we included a dummy variable for that group based on administrative data from the state (unpublished data). Finally, we included a dummy variable on mobility disability, which was defined as needing any type of specialized equipment or services to travel outside the home (eg, assistance from another person, interpreter, manual wheelchair).

## Statistical Analysis

We computed descriptive statistics (frequencies and counts) for all items. We examined bivariate correlations between the receipt of RMT (none, some, and many) and the dependent variables using Fisher's exact tests. We conducted subanalyses to compare results for those with and without mobility disability. The sample sizes for the other covariates were too small for meaningful subanalyses.

For variables that were significant in bivariate analyses, we used multivariable logistic regressions to determine the odds of rating the outcome variables positively while controlling for confounders. The variable for on-time pickup was reverse-coded for easier interpretation of results and will be referred to as “late pickup.” To correct bias from the small sample size,<sup>29</sup> we bootstrapped the standard errors with 500 repetitions to increase confidence in the statistical significance of our findings. Model fit was assessed using the Hosmer-Lemeshow goodness-of-fit test.

## Sensitivity Analyses

To determine if our choice of timing affected the results, we tested both the bivariate association and full regression models utilizing a 6-month time period before the survey was received instead of a 1-year time period.

## RESULTS

Table 1 shows the sample characteristics. The majority of respondents were aged between 18 and 64 years (69.2%), female (61.2%), and White (71.1%). More than 18% of the respondents were on the DD waiver, and 44% had a mobility disability. Among all respondents, 18.0% had many RMT trips, 17.3% had some RMT trips, and 64.7% had no RMT trips. A large majority of respondents had positive ratings for the ride

quality questions. Just over half of respondents (50.2%) reported having a failed pickup often.

**Table 2** shows the bivariate associations between the proportion of rideshare trips and each of the questions on quality and access. Ride quality measures did not differ across the proportion of RMT trips provided. In contrast, having more rideshare trips was associated with reporting late pickup ( $P = .012$ ) and failed pickup ( $P < .001$ ). For late pickup, 47.8% of individuals with many RMT trips reported they often had a late pickup compared with 27.3% for those with some RMT trips and 25.0% for those with no RMT trips. For failed pickup, 65.2% of those with many RMT trips reported they often had a failed pickup and 67.6% of those with some RMT trips agreed compared with 39.7% of those with no RMT trips. The sensitivity analyses using NEMT data from the last 6 months instead of from the last year yielded similar results (**eAppendix Table 3**). Results and tables for the bivariate analysis by mobility disability are shown in **eAppendix Table 4** and reveal that, for this subgroup, responses for some of the dependent variables differed by proportion of RMT.

### Multivariable Logistic Regression Analyses

**Table 3** shows the results for 2 logistic regression models for the late pickup and failed pickup outcomes. All models passed the goodness-of-fit tests. In the first model, having some or many RMT trips compared with no RMT trips was associated with increased odds of reporting a late pickup, but the association was no longer statistically significant. There was a small (odds ratio [OR], 0.970; 95% CI, 0.949-0.992) but significant decrease in the odds of late pickup for every 1-year increase in age. There were no significant associations between the other variables and reporting late pickup.

In the second model, having some RMT trips increased the odds of failed pickup by a factor of 3.44 compared with those with no RMT trips, and having many RMT trips increased the odds of failed pickup by a factor of 3.06. There was also a small decrease in the odds of failed pickup for every year increase in age (OR, 0.979; 95% CI, 0.959-1.000). In our sensitivity analyses (**eAppendix Table 3**), both models with a shorter time window (6 months instead of 1 year prior

**TABLE 2.** Differences in Responses to Items on Ride Quality and Access to Care by Proportion of NEMT Trips From Rideshare Drivers Among a Sample of Medicaid Enrollees

Survey items	Level <sup>a</sup>	No RMT trips (n = 172)	Some RMT trips (< 50%) (n = 46)	Many RMT trips (≥ 50%) (n = 48)	P <sup>b</sup>
The vehicle was often appropriate to meet your transportation needs.	Disagree	19 (13.3%)	2 (5.3%)	6 (14.0%)	.40
	Agree	124 (86.7%)	36 (94.7%)	37 (86.0%)	
The driver was often polite and courteous.	Disagree	14 (9.7%)	3 (7.0%)	7 (15.6%)	.44
	Agree	131 (90.3%)	40 (93.0%)	38 (84.4%)	
I often felt safe when riding with a transportation driver.	Disagree	16 (11.0%)	4 (9.3%)	9 (19.6%)	.27
	Agree	129 (89.0%)	39 (90.7%)	37 (80.4%)	
The vehicle was often clean.	Disagree	17 (12.0%)	5 (11.4%)	6 (13.0%)	.96
	Agree	125 (88.0%)	39 (88.6%)	40 (87.0%)	
The vehicle was often in good mechanical repair.	Disagree	21 (14.9%)	5 (11.4%)	10 (22.2%)	.35
	Agree	120 (85.1%)	39 (88.6%)	35 (77.8%)	
The driver was often late to pick me up to or from an appointment.	Disagree	105 (75.0%)	32 (72.7%)	24 (52.2%)	.012
	Agree	35 (25.0%)	12 (27.3%)	22 (47.8%)	
The driver often failed to pick me up for a medical appointment.	Disagree	76 (60.3%)	12 (32.4%)	16 (34.8%)	<.001
	Agree	50 (39.7%)	25 (67.6%)	30 (65.2%)	

NEMT, nonemergency medical transportation; RMT, rideshare-based medical transportation.

<sup>a</sup>The original responses to the survey items were "never" or "sometimes" for disagree and "usually" or "always" for agree, except for the last item, "The driver often failed to pick me up..." for which "never" is disagree and "sometimes," "usually," or "always" is agree.

<sup>b</sup>Fisher's exact test  $P$  value (for questions with cell counts  $\leq 5$ ) and Pearson's  $\chi^2$  (for questions with cell counts  $> 5$ ).

**TABLE 3.** Multivariable Logistic Regression Results for Having Late and Failed Pickup to Health Care Appointments Among a Sample of Medicaid Enrollees<sup>a</sup>

	Late pickup <sup>b</sup> (n = 207)		Failed pickup <sup>c</sup> (n = 188)	
	OR	95% CI	OR	95% CI
No RMT trips (reference)				
Some RMT trips (< 50%)	1.594	0.571-4.448	3.443	1.368-8.666**
Many RMT trips (≥ 50%)	2.449	0.954-6.290	3.056	1.259-7.420*
Age	0.970	0.949-0.992**	0.979	0.959-1.000*
Male	1.423	0.627-3.229	0.597	0.268-1.327
White	0.984	0.388-2.497	1.251	0.498-3.138
Missing race	1.114	0.267-4.649	1.405	0.286-6.903
Latino	0.952	0.334-2.708	1.363	0.368-5.047
On DD waiver	1.166	0.310-4.389	0.350	0.086-1.424
Mobility disability	0.735	0.326-1.657	1.569	0.714-3.449
Total trips	0.997	0.993-1.000	0.999	0.997-1.002
Frequency of medical appointments	0.460	0.183-1.154	0.700	0.300-1.633
Trip > 30 minutes	2.392	0.970-5.901	1.046	0.420-2.600

DD, developmental disability; OR, odds ratio; RMT, rideshare-based medical transportation.

\* $P < .05$ ; \*\* $P < .01$ .

<sup>a</sup>Reference groups: gender: female; race: minority; missing race: responded to race question; frequent medical appointments: infrequent medical appointments; trip time: less than 30 minutes; waiver: other waiver; mobility disability: does not have a mobility disability.

<sup>b</sup>Usually or always vs sometimes or never. Hosmer-Lemeshow goodness of fit,  $\chi^2(8) = 1107$ ;  $P = .1997$ ; C statistic = 0.7528.

<sup>c</sup>Sometimes, usually, or always vs never. Hosmer-Lemeshow goodness of fit,  $\chi^2(8) = 10.35$ ;  $P = .2411$ ; C statistic = 0.7327.



## POLICY

to the survey) had results similar to the main models. One exception was that in the shorter time window, having some RMT trips was no longer statistically significant in the failed pickup model.

## DISCUSSION

This study sought to identify whether having more RMT trips was associated with better quality ratings of NEMT and improved access to care for a sample of Medicaid enrollees. We found that having more RMT trips was not associated with reported quality of NEMT in terms of appropriateness, safety of the vehicle, or driver courteousness. In contrast, having more rideshare trips was associated with reporting late and failed pickups of NEMT riders. The statistical significance of the associations held in multivariable analysis for reporting failed pickup.

The appropriateness of the rideshare vehicle, safety, and driver attitudes are major concerns for use of RMT.<sup>17,18</sup> Some preliminary results from an RMT pilot in New York City and California indicated a high level of safety and satisfaction, yet there was no control group for comparison and only pilot results have been reported.<sup>22</sup> In this study, we were able to compare groups with different levels of rideshare trips (none, some, and many). Across groups, the ratings for ride quality were generally high. We did not find significant differences in responses to the ride quality measures between those with some or many trips with RMT compared with those with traditional NEMT only; this finding can be interpreted both positively and negatively. On one hand, RMT use had similar ratings of driver and ride quality. If maintaining quality was the goal, it would be met. On the other hand, RMT may be less attractive if improving quality was an important outcome for a state's Medicaid program.

As the proportion of RMT increased, the likelihood of late and failed pickup of NEMT riders also increased: Those who received RMT more frequently were more likely to report late pickup or failed pickup compared with those who received RMT less frequently or used only traditional NEMT. These findings suggest that access to health care may be affected by RMT trips; more research is needed to determine why these differences exist.

RMT may affect health care access for various reasons. One potential explanation is that rideshare drivers may not receive adequate training and may not face consequences for a failed or late pickup. Rideshare dispatch technology problems can lead to access issues. Additional measures may be needed when providing RMT to enrollees with mobility disability, such as building a larger pool of accessible vehicles. Additionally, lower access may be related to cost-reduction strategies used by the NEMT broker. We learned that the NEMT broker in the state under study had a lower bid for its contract and drivers were generally dissatisfied by the pay rate (unpublished data). As costs are reduced, quality or access to care is often affected.<sup>16</sup> The evaluation was completed during the second year of the broker's contract. It is possible that access may improve over a longer period of time when both drivers and enrollees are more familiar with RMT.

Transportation brokers have a plethora of data on shared ride logistics like pickup time and location. However, it is important to understand patients' perceived access (in this case, late or failed pickup) because these perceptions could be reasons for why consumers may or may not continue to use transportation services. In the course of our evaluation, we also found that the NEMT broker could track late pickups but not failed pickups. Although drivers could report consumers who do not show, consumers may be underreporting when drivers do not show. In a previous evaluation, we found that consumers dissatisfied with an NEMT service sometimes do not bother calling the broker but focus on finding alternative transportation. Understanding the experiences of patients with new services like RMT is critical to tease out patient satisfaction and the likelihood of repeated use. Lower satisfaction with NEMT threatens consistent attendance of medical appointments by the enrollees who are in the most need of care.<sup>25</sup> One group in particular to consider is individuals with mobility disabilities. In subanalyses, individuals with mobility disabilities with more RMT trips had significantly lower ratings for some of the quality and access measures than those with no RMT. This may reflect problems with vehicle accessibility, which have also been cited in lawsuits against rideshare companies in Chicago and parts of California.<sup>19,20</sup> Future research should evaluate RMT for other transportation-disadvantaged subgroups. This research would be useful for policy makers and other stakeholders in understanding access and experiences with RMT.

### Strengths and Limitations

Our study had several strengths. This paper was novel because we linked survey data on consumer experiences to administrative records of health care trips for Medicaid recipients. Our measure for the proportion of RMT was not biased by patient behavioral factors but focused the analysis on the rideshare trip. Finally, the research was based on an independent evaluation of NEMT that was not associated with any rideshare company.

Our study also had some limitations. Like many Medicaid surveys, our response rate was low, at 28.3%.<sup>27</sup> We were unable to reach many enrollees because changes of residence and phone number are common among the Medicaid population.<sup>28,30</sup> Our comparison of administrative data for responders and nonresponders indicated significant differences, which affects the generalizability of our results. Respondents did not answer all the questions, which reduced the analytic sample for some of the analyses. Clients may have become aware that the driver was not from a traditional transportation company. Because our analysis was cross-sectional and lacked any causal approaches to address omitted variable bias, the results can only reflect associations between RMT and quality and access.

## CONCLUSIONS

Rideshare companies continue to expand into transportation to health care appointments. As more states incorporate ridesharing

into their NEMT delivery models, it is critical to evaluate patient experiences and perceptions. Although RMT may be attractive for its efficiency and lower costs, additional research is needed in diverse settings and varied populations to understand how RMT differs from traditional NEMT and how RMT affects quality and access to care. ■

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**eAppendix Table 1.** Baseline Differences for Responders and Non-responders of the NEMT Transportation Survey

	Responders (n = 266)	Non-responders (n = 678)	Test value	P value
Mean age-mean (sd)	43.08 (20.63)	34.62 (22.95)	5.487 <sup>a</sup>	<.001
Number of Trips - median (1Q, 3Q)	38 (8.8, 112)	21 (6, 75.3)	104277.5 <sup>b</sup>	<.001
Has Guardian	62 (23.3)	312 (46.0)	41.186 <sup>c</sup>	<.001
No guardian	204 (76.7)	366 (54.0)		
DD waiver	49 (18.4)	93 (13.7)	3.308 <sup>c</sup>	0.069
Other waiver	217 (81.6)	585 (86.3)		
Urban County	116 (43.6)	289 (42.6)	0.075 <sup>c</sup>	0.784
Rural County	150 (56.4)	389 (57.4)		
Trips in past year				
0-2 trips taken	25 (9.4)	95 (14.0)	11.562 <sup>c</sup>	0.003
3-24 trips taken	85 (32)	267 (39.4)		
25+ trips taken	156 (58.6)	316 (46.6)		
<i>Note:</i> DD = developmental disability; NEMT = non-emergency medical transportation; SD = standard deviation; 1Q = first quartile; 3Q = third quartile.				
Data sources: Administrative records of Medicaid Enrollees				
<sup>a</sup> t-test				
<sup>b</sup> Mann-Whitney U test				
<sup>c</sup> chi-square test				

**eAppendix Table 2.** Sensitivity Analysis of Differences in Responses to Items on Ride Quality and Access to Care by Proportion of Non-Emergency Medical Transportation Trips from Rideshare Drivers Among a Sample of Medicaid Enrollees

Survey Items	Level <sup>a</sup>	In the last Year				In the last 6 months			
		No RMT trips n=172	Some RMT trips <sup>b</sup> n=46	Many RMT trips <sup>c</sup> n=48	<i>p</i> <sup>b</sup>	No RMT trips n= 138	Some RMT trips <sup>b</sup> n= 36	Many RMT trips <sup>c</sup> n= 40	<i>p</i> <sup>b</sup>
The vehicle was often appropriate to meet your transportation needs.	Disagree	19 (13.3%)	2 (5.3%)	6 (14.0%)	0.40	17 (13.6%)	1 (3.6%)	4 (10.8%)	0.35
	Agree	124 (86.7%)	36 (94.7%)	37 (86.0%)		108 (86.4%)	27 (96.4%)	33 (89.2%)	
The driver was often polite and courteous.	Disagree	14 (9.7%)	3 (7.0%)	7 (15.6%)	0.44	12 (9.5%)	2 (6.1%)	5 (13.2%)	0.60
	Agree	131 (90.3%)	40 (93.0%)	38 (84.4%)		114 (90.5%)	31 (93.9%)	33 (86.8%)	
I often felt safe when riding with a transportation driver.	Disagree	16 (11.0%)	4 (9.3%)	9 (19.6%)	0.27	12 (9.5%)	3 (9.1%)	7 (17.9%)	0.33
	Agree	129 (89.0%)	39 (90.7%)	37 (80.4%)		114 (90.5%)	30 (90.9%)	32 (82.1%)	
The vehicle was often clean.	Disagree	17 (12.0%)	5 (11.4%)	6 (13.0%)	0.96	13 (10.5%)	3 (8.8%)	4 (10.3%)	1.00
	Agree	125 (88.0%)	39 (88.6%)	40 (87.0%)		111 (89.5%)	31 (91.2%)	35 (89.7%)	
The vehicle was often in good mechanical repair.	Disagree	21 (14.9%)	5 (11.4%)	10 (22.2%)	0.35	17 (13.7%)	4 (11.8%)	10 (26.3%)	0.16
	Agree	120 (85.1%)	39 (88.6%)	35 (77.8%)		107 (86.3%)	30 (88.2%)	28 (73.7%)	
	Disagree	105 (75.0%)	32 (72.7%)	24 (52.2%)	0.012	95 (77.2%)	26 (76.5%)	21 (53.8%)	0.021

The driver was often late to pick me up to or from an appointment.	Agree	35 (25.0%)	12 (27.3%)	22 (47.8%)		28 (22.8%)	8 (23.5%)	18 (46.2%)	
The NEMT transportation often failed to pick me up for a medical appointment.	Disagree	76 (60.3%)	12 (32.4%)	16 (34.8%)	< 0.001	65 (59.1%)	12 (42.9%)	12 (30.8%)	0.007
	Agree	50 (39.7%)	25 (67.6%)	30 (65.2%)		45 (40.9%)	16 (57.1%)	27 (69.2%)	
<p><sup>a</sup> The original responses to the survey items was "Never" or "Sometimes" for Disagree and "Usually" or "Always" for Agree, except for the last item, "The driver often failed to pick me up ..." for which "Never" is Disagree and "Sometimes," "Usually" or "Always" is Agree.</p> <p><sup>b</sup> &lt; 50% <sup>c</sup> &gt; = 50%</p> <p>*p&lt;0.05, **p&lt;0.01, ***p&lt;0.001</p> <p>Fisher's Exact test <i>p</i> value</p>									

**eAppendix Table 3.** Sensitivity Analyses Comparing Multivariable Logistic Regression Results for Late Pickup and Failed Pickup by One Year VS Six Months of NEMT Trip Data from the Month of Participant Survey

	Late pickup during the last year <sup>ab</sup> (N = 207)		Late pickup during the last six months <sup>ac</sup> (N = 178)		Failed pickup during the last year <sup>de</sup> (N = 188)		Failed pickup during the last six months <sup>df</sup> (N = 161)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
No RMT trips (Ref)								
Some RMT trips (< 50%)	1.594	(0.571, 4.448)	1.303	(0.411, 4.127)	3.443	(1.368, 8.666) **	2.150	(0.703, 6.572)
Many RMT trips (> 50%)	2.449	(0.954, 6.290)	2.942	(0.965, 8.965)	3.056	(1.259, 7.420) *	4.437	(1.540, 12.78) **
Age	0.970	(0.949, 0.992) **	0.975	(0.950, 0.999) *	0.979	(0.959, 1.000) *	0.984	(0.960, 1.007)
Male	1.423	(0.627, 3.229)	1.495	(0.623, 3.590)	0.597	(0.268, 1.327)	0.523	(0.238, 1.149)
White	0.984	(0.388, 2.497)	0.904	(0.303, 2.701)	1.251	(0.498, 3.138)	1.089	(0.353, 3.359)
Missing race	1.114	(0.267, 4.649)	0.84	(0.147, 4.788)	1.405	(0.286, 6.903)	1.451	(0.184, 11.43)
Latino	0.952	(0.334, 2.708)	1.067	(0.281, 4.051)	1.363	(0.368, 5.047)	1.288	(0.350, 4.733)
On the DD waiver	1.166	(0.310, 4.389)	1.043	(0.219, 4.968)	0.350	(0.086, 1.424)	0.513	(0.102, 2.569)
Mobility disability	0.735	(0.326, 1.657)	0.544	(0.213, 1.391)	1.569	(0.714, 3.449)	1.383	(0.577, 3.315)
Total trips	0.997	(0.993, 1.000)	0.996	(0.990, 1.002)	0.999	(0.997, 1.002)	0.999	(0.995, 1.004)
Frequency of medical appointments	0.460	(0.183, 1.154)	0.512	(0.168, 1.558)	0.700	(0.300, 1.633)	0.572	(0.222, 1.474)
Trip greater than 30 min	2.392	(0.970, 5.901)	3.53	(1.112, 11.21) *	1.046	(0.420, 2.600)	1.192	(0.453, 3.131)
Significance: + p<0.10 * p<0.05 ** p<0.01 *** p<0.001 Reference groups: Gender: female; race: minority; missing race: responded to race question; frequent medical appointments: infrequent medical appointments; trips time: less than 30 minutes; waiver: other waiver; mobility disability: does not have a mobility disability.								

<sup>a</sup> Usually or always vs. sometimes or never

<sup>b</sup> Hosmer-Lemeshow Goodness of Fit,  $X^2(8) = 1107$ ,  $p = 0.1997$ ; *C statistic* = 0.7528

<sup>c</sup> Hosmer-Lemeshow Goodness of Fit,  $X^2(8) = 6.90$ ,  $p = 0.5474$ ; *C statistic* = 0.7682

<sup>d</sup> Usually, always or sometimes vs. never

<sup>e</sup> Hosmer-Lemeshow Goodness of Fit,  $X^2(8) = 10.35$ ,  $p = 0.2411$ ; *C statistic* = 0.7327

<sup>f</sup> Hosmer-Lemeshow Goodness of Fit,  $X^2(8) = 1.65$ ,  $p = 0.9899$ ; *C statistic* = 0.7298

In the bivariate analysis by mobility disability (see Table A.4), there were no differences for most of the ride quality variables across those having none, some, or many rideshare trips for both those with and without mobility disabilities. However, among those with mobility disabilities, a lower percentage (74%) with many RMT trips agreed that, ‘The vehicle was often appropriate to meet your transportation needs’ compared to 100% of those with some RMT trips and 89% of those with no RMT trips. There was no difference among RMT trips group and those without mobility disabilities for the same question on vehicle appropriateness. For the access to care questions, there were significant differences across RMT trips groups. Among respondents with mobility disabilities, 55% of those with many RMT trips agreed that the driver was often late for pickups compared to 28% for those with some RMT trips and 15% for those with no RMT trips ( $p = 0.002$ ). For those without mobility disabilities, there was no difference in the distribution across RMT trips groups for the late pickup question ( $p = 0.52$ ). For the question on failed pickups, there was a significant difference across rideshare groups for both people with and without mobility disabilities. In both cases, the more rides from RMT drivers, the higher percentage that agreed they often had a failed pickup.

**eAppendix Table 4.** Differences in Responses to Items on Ride Quality and Access to Care by Proportion of Non-Emergency Medical Transportation Trips and Mobility Disability from Rideshare Drivers

Survey Items	Mobility Disability n= 116				No Mobility Disability n= 150				
	Level <sup>a</sup>	Zero RMT trips n=74	Some RMT trips <sup>b</sup> n=20	Many RMT trips <sup>c</sup> n=22	p-value	Zero RMT trips n=98	Some RMT trips <sup>b</sup> n=26	Many RMT trips <sup>c</sup> n=26	p-value
The vehicle was often appropriate to meet your transportation needs.	Disagree	7 (11%)	0 (0%)	5 (26%)	0.046	12 (15%)	2 (10%)	1 (4%)	0.37
	Agree	56 (89%)	17 (100%)	14 (74%)		68 (85%)	19 (90%)	23 (96%)	
The driver was often polite and courteous.	Disagree	5 (8%)	0 (0%)	4 (20%)	0.12	9 (11%)	3 (12%)	3 (12%)	1.00
	Agree	59 (92%)	17 (100%)	16 (80%)		72 (89%)	23 (88%)	22 (88%)	
I often felt safe when riding with a transportation driver.	Disagree	5 (8%)	1 (6%)	3 (15%)	0.59	11 (14%)	3 (12%)	6 (23%)	0.46
	Agree	59 (92%)	17 (94%)	17 (85%)		70 (86%)	22 (88%)	20 (77%)	
The vehicle was often clean.	Disagree	6 (10%)	1 (6%)	5 (25%)	0.18	11 (14%)	4 (15%)	1 (4%)	0.34
	Agree	55 (90%)	17 (94%)	15 (75%)		70 (86%)	22 (85%)	25 (96%)	
The vehicle was often in good mechanical repair.	Disagree	7 (11%)	1 (6%)	4 (20%)	0.41	14 (18%)	4 (15%)	6 (24%)	0.77
	Agree	56 (89%)	17 (94%)	16 (80%)		64 (82%)	22 (85%)	19 (76%)	
The driver was often late to pick me up to or from an appointment.	Disagree	52 (85%)	13 (72%)	9 (45%)	0.002	53 (67%)	19 (73%)	15 (58%)	0.52
	Agree	9 (15%)	5 (28%)	11 (55%)		26 (33%)	7 (27%)	11 (42%)	



The NEMT transportation often failed to pick me up for a medical appointment.	Disagree	31 (57%)	2 (14%)	8 (40%)	0.011	45 (63%)	10 (43%)	8 (31%)	0.013
	Agree	23 (43%)	12 (86%)	12 (60%)		27 (38%)	13 (57%)	18 (69%)	
<p><sup>a</sup> The original responses to the survey items was "Never" or "Sometimes" for Disagree and "Usually" or "Always" for Agree, except for the last item, "The driver often failed to pick me up ..." for which "Never" is Disagree and "Sometimes," "Usually" or "Always" is Agree.</p> <p><sup>b</sup> Fisher's Exact test <i>p</i> value</p>									