FY 2016 Houston EMA/HSDA Ryan White Part A Service Definition **Medical Transportation (Van Based)** (Revision Date: 03/03/14)	
HRSA Service Category Title: **RWGA Only**	**Medical Transportation**
Local Service Category Title:	**a. Transportation targeted to Urban** **b. Transportation targeted to Rural**
Budget Type: **RWGA Only**	**Hybrid Fee for Service**
Budget Requirements or Restrictions: **RWGA Only**	• Units assigned to Urban Transportation must only be used to transport clients whose residence is in Harris County. • Units assigned to Rural Transportation may only be used to transport clients who reside in Houston EMA/HSDA counties other than Harris County. • Mileage reimbursed for transportation is based on the documented distance in miles from a client's Trip Origin to Trip Destination **as documented by a standard Internet-based mapping program (i.e. Google Maps, Map Quest, Yahoo Maps) approved by RWGA.** 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. • Transportation to employment, employment training, school, or other activities not directly related to a client's treatment of HIV disease is not allowable. Clients may not be transported to entertainment or social events under this contract. • 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. • Contractor must reserve 7% of the total budget for Taxi Vouchers. • Maximum monthly utilization of taxi vouchers cannot exceed 14% of the total amount of funding reserved for Taxi Vouchers. • 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. • **Contractor must provide RWGA a copy of the agreement between Contractor and a licensed taxi vendor by March 30, 2015.** • 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). • 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.
HRSA Service Category Definition: **RWGA Only**	**Medical transportation services** include conveyance services provided, directly or through voucher, to a client so that he or she may access health care services.
Local Service Category Definition:	a. Urban Transportation: Contractor will develop and implement a medical transportation program that provides essential transportation services to **HRSA-defined Core Services** 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. b. Rural Transportation: Contractor will develop and implement a medical transportation program that provides essential transportation services to **HRSA-defined Core Services** 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. 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. The Contractor shall ensure that the transportation program provides taxi vouchers to eligible clients only in the following cases: • To access emergency shelter vouchers or to attend social security disability hearings; • Van service is unavailable due to breakdown or inclement weather; • Client's medical need requires immediate transport; • Scheduling Conflicts. **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.**

	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. **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.** It is the 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. 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.
Target Population (age, gender, geographic, race, ethnicity, etc.):	a. Urban Transportation: HIV/AIDS-infected and Ryan White Part A/B eligible affected individuals residing in Harris County. 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.
Services to be Provided:	To provide Medical Transportation services to access Ryan White Program defined **Core Services** 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. **Eligibility for Transportation Services is determined by the client's County of residence as documented in the CPCDMS**.
Service Unit Definition(s): **RWGA Only**	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.
Financial Eligibility:	Refer to the RWPC's approved *FY 2015 Financial Eligibility for Houston EMA Services*.

Client Eligibility:	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. 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. Documentation of the client's eligibility in accordance with approved 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. 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.
Agency Requirements	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 1st 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. 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. **Contractor must also have the following equipment dedicated to the general transportation program:** • 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. **The telephone line must be managed by a live person between the hours of 8:00 a.m. – 5:00 p.m.** Telephone calls to an answering machine utilized after 5:00 p.m. must be returned by 9:00 a.m. the following business day. • A fax machine with a dedicated line. • All equipment identified in the Transportation Standards of Care necessary to transport children in vehicles. • Contractor must assure clients eligible for Medicaid transportation

	are billed to Medicaid. This is subject to audit by the County. 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 individuals provided with transportation, as well as origin and destination of trips. ***It is the Contractor's responsibility to verify the County in which clients reside in.***
Staff Requirements	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.
Special Requirements: **RWGA Only**	Individuals who qualify for transportation services through Medicaid are not eligible for these transportation services. **Contractor must ensure the following criteria are met for all clients transported by Contractor's transportation program:** Transportation Provider must ensure that clients use transportation services for an appropriate purpose through one of the following three methods: 1. Follow-up hard copy verification between transportation provider and Destination Agency (DA) program confirming use of eligible service(s), or 2. Client provides receipt documenting use of eligible services at Destination Agency on the date of transportation, or 3. Scheduling of transportation services was made by receiving agency's case manager or transportation coordinator. The verification/receipt form must at a minimum include all elements listed below: • Be on Destination Agency letterhead • Date/Time • CPCDMS client code • Name and signature of Destination Agency staff member who attended to client (e.g. case manager, clinician, physician, nurse) • Destination Agency date stamp to ensure DA issued form.

FY 2017 RWPC "How to Best Meet the Need" Decision Process

Step in Process: **Council**		Date: **06/09/2016**
Recommendations:	Approved: Y:_____ No: _____ Approved With Changes:_____	If approved with changes list changes below:
1.		
2.		
3.		

Step in Process: **Steering Committee**		Date: **06/02/2016**
Recommendations:	Approved: Y:_____ No: _____ Approved With Changes:_____	If approved with changes list changes below:
1.		
2.		
3.		

Step in Process: **Quality Improvement Committee**		Date: **05/19/2016**
Recommendations:	Approved: Y:_____ No: _____ Approved With Changes:_____	If approved with changes list changes below:
1.		
2.		
3.		

Step in Process: **HTBMTN Workgroup**	Date: **04/27/2016**
Recommendations:	Financial Eligibility:
1.	
2.	
3.	

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Traveling Towards Disease: Transportation Barriers to Health Care Access

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Abstract

Transportation barriers are often cited as barriers to healthcare access. Transportation barriers lead to rescheduled or missed appointments, delayed care, and missed or delayed medication use. These consequences may lead to poorer management of chronic illness and thus poorer health outcomes. However, the significance of these barriers is uncertain based on existing literature due to wide variability in both study populations and transportation barrier measures. The authors sought to synthesize the literature on the prevalence of transportation barriers to health care access. A systematic literature search of peer-reviewed studies on transportation barriers to healthcare access was performed. Inclusion criteria were as follows: (1) study addressed access barriers for ongoing primary care or chronic disease care; (2) study included assessment of transportation barriers; and (3) study was completed in the United States. In total, 61 studies were reviewed. Overall, the evidence supports that transportation barriers are an important barrier to healthcare access, particularly for those with lower incomes or the under/uninsured. Additional research needs to (1) clarify which aspects of transportation limit health care access (2) measure the impact of transportation barriers on clinically meaningful outcomes and (3) measure the impact of transportation barrier interventions and transportation policy changes.

Keywords

Healthcare access; Transportation barriers; Medication access; Healthcare barriers

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Introduction

Transportation is a basic but necessary step for ongoing health care and medication access, particularly for those with chronic diseases (Fig. 1). Chronic disease care requires clinician visits, medication access, and changes to treatment plans in order to provide evidence-based care. However, without transportation, delays in clinical interventions result. Such delays in care may lead to a lack of appropriate medical treatment, chronic disease exacerbations or unmet health care needs, which can accumulate and worsen health outcomes [1, 2].

Patients with transportation barriers carry a greater burden of disease which may, in part, reflect the relationship between poverty and transportation availability [3]. As a result, understanding the relationship between transportation barriers and health may be important to addressing health in the most vulnerable who live in poverty.

Transportation is often cited as a major barrier to health care access [4–35]. Studies have found transportation barriers impacting health care access in as little as 3 % or as much as 67 % of the population sampled [25, 36]. The wide variability in study findings makes it difficult to determine the ultimate impact that transportation barriers have on health.

This review summarizes and critically evaluates the empirical evidence on transportation barriers to health care access for primary and chronic disease care. For each of the 61 studies reviewed, we evaluated the population characteristics, methods, measures of transportation barriers and results (Table 1). Results are organized into three sections: (1) measurement of transportation barriers, (2) transportation barriers and demographic differences, and (3) measurement of the impact of transportation barriers. Additionally, we define a research agenda based on gaps in the literature and discuss potential intervention opportunities and public policy considerations.

Methods

We searched for peer-reviewed studies that addressed transportation barriers in relation to ongoing health care access. Inclusion criteria were as follows: (1) study addressed access barriers for ongoing primary care or chronic disease care; (2) study included assessment of transportation barriers; and (3) study was completed in the United States. Articles dealing with access to prenatal care, emergency or acute care, or exclusive attention to general screening and prevention were excluded as they may represent a single visit or limited time period of care.

We used PubMed with the following keyword search terms (number of articles returned): *transportation barriers* (963), *transportation barriers clinic* (129), *transportation barriers pharmacy* (13), *transportation barriers hospital* (183), *transportation barriers doctor* (69), *transportation barriers health access* (276), and *transportation barriers chronic disease* (33). Medical Subject Heading (MESH) terms included *health services accessibility AND transportation* (575). Additional background information was found using the terms *transportation barriers health access* to search Web of Science and Psych Info, and *transportation barriers* to search The New York Academy of Medicine Library's Grey Literature Report.

Abstracts were reviewed for inclusion criteria, and if necessary, full text articles were also reviewed. A secondary review of bibliographies was also conducted. In the final review, 61 articles met the inclusion criteria. The search was concluded in December 2012.

Results

Measures of Transportation Barriers

Vehicle Access and Mode of Travel—Nine studies assessed the influence of vehicle access upon access to health care, and all found a positive relationship [24–26, 37–42]. Vehicle access refers to either owning a car or having access to a car through a family member or friend. Arcury et al. [37] studied the relationship of transportation to health care utilization in 1,059 rural Appalachians and found that people who knew someone who regularly provided rides to a member of their family had a greater utilization of health care (Odds Ratio, OR 1.58). Those with a driver's license, independent of other factors, also had greater health care utilization (OR 2.29).

Guidry et al. [26] surveyed 593 cancer patients throughout Texas, and found 38 % of whites, 55 % of African Americans, and 60 % of Hispanics identified poor access to a vehicle as a barrier that could result in missing a cancer treatment.

A study by Salloum et al. [38] looked retrospectively (2000–2007) at 406 cancer patients to see if patients were more or less likely to receive first line chemotherapy based on their demographics. Patients who were significantly less likely to receive first line chemotherapy lived in neighborhoods that had a higher percentage of households without any vehicle. Distance to the nearest chemotherapy facility was not a significant factor.

Rask et al. [40] studied obstacles to care for 3,897 urban, low socioeconomic status (SES) adults in Atlanta and found that walking or using public transportation to receive medical care was an independent predictor of not having a regular source of care (OR 1.44). Patients who did not use private transportation were also more likely to delay care (OR 1.45).

Flores et al. studied 203 children's caretakers and found that 21 % of inner-city children faced transportation barriers to timely health care. Of these, 62 % cited lack of a car as the specific barrier, which exceeded other reasons including excessive distance, expense, or inconvenience of public transportation [24].

Two studies reported that 25 % of patients missed an appointment due to transportation problems [41, 42]. Yang et al. [41] studied 183 urban caregivers from Houston and their children's missed appointments, finding that an inability to find a ride resulted in at least one missed appointment for 25 % of the sample. The study also found that 82 % of those who kept their appointments had access to a car, compared to just 58 % of those who did not keep their appointments. Similarly, in a study of 698 low-income adult patients, Silver et al. [42] found that 25 % of missed appointments/rescheduling needs were due to transportation problems and bus users were twice as likely to miss their appointments compared to car users.

One study investigated transit accessibility to health care by either public transit or by foot in various low income counties in the Bay Area [43]. Results revealed that transit accessibility to a hospital, defined as getting to a hospital or clinic in 30 min or less by public transit or ½ mile by foot, varied from 0 to 28 %. Additionally, 55 % of missed appointments or late arrivals were due to transportation problems.

Collectively, these studies suggest that lack or inaccessibility of transportation may be associated with less health care utilization, lack of regular medical care, and missed medical appointments, particularly for those from lower economic backgrounds.

Urban and Rural Geography—Urban and rural locations often differ in transit options, cost of transit, and availability of and distance to health care providers. Despite this, results were mixed in the four studies that compared the impact of transportation barriers on health care access for urban and rural residences [14, 44–46]. Blazer et al. [14] surveyed 4,162 urban and rural adults over 65 in North Carolina to investigate why patients delayed or neglected to see a doctor. The study showed no difference between urban and rural adults in either their use of health services or identification of transportation barriers. Similarly, a study by Skinner et al. [46] included 38,866 households, and found no difference in reports of delayed care between urban and rural parents after controlling for SES.

In contrast, three studies found that rural patients face greater transportation barriers to health care access than their urban counterparts [44–46]. Rural patients reported more problems with transportation and travel distance to health care providers and had a higher burden of travel for health care when measured by distance and time traveled [45]. In a study by Sarnquist et al. [47] that did not make urban comparisons, but included 64 rural, adult HIV patients, 31 % were lacking transportation and 37 % were missing appointments due to transportation problems.

Travel Burden by Time and Distance—Nine studies evaluated distance as a barrier to health care access with mixed results [25, 26, 48–54]. Six found that distance was a barrier to care [25, 26, 48–51]. Of those, five investigated a variation of the question, ‘Is distance a barrier to health care access?’, to measure the impact of distance [25, 26, 48–50]. The sixth study explored the association between distance to providers and patient reported health care utilization [51]. In contrast, two studies found that distance to a provider was not associated with differences in health care utilization [53, 54]. Surprisingly, one study by Lamont et al. [52] found that a longer distance to one’s health care facility was associated with improved health care access. Two studies looked at the relationship of distance to either medication use or clinical outcomes, reporting that longer driving distances from one’s physician are associated with less insulin use or poorer glycemic control independent of social, clinical or economic factors [53, 54].

Transportation Barriers and Demographic Differences

Transportation Barriers and Ethnic Differences—Of six studies comparing transportation barriers to health care access across ethnic groups, five found differences [3, 20, 26, 45, 55, 56]. To understand whether ethnic differences independently account for

differences in transportation barriers, socioeconomic factors must be considered because they can influence transportation variables [57].

Three studies used national data sets to explore transportation barriers to health care access in minorities, and all controlled for SES [3, 20, 45]. A large secondary analysis of National Health Interview Survey (NHIS) data, Medical Expenditure Panel Survey (MEPS) data, and Bureau of Transportation Statistics (BTS) data, by Wallace et al. [3], estimated that 3.6 million people do not obtain medical care due to transportation barriers. These individuals were more likely to be older, poorer, less educated, female, and from an ethnic minority group. Individuals carrying the highest burden of disease also faced the greatest burden of transportation barriers. In the second study, Johnson et al. [20] analyzed NHIS data from 1997 to 2006 to compare reasons for delayed health care access between 34,504 American Indian/Alaskan Natives and White Veterans, and found that American Indian/Alaskan Natives were more likely to delay care due to transportation problems.

A third study by Probst et al. [45] utilized a cross-sectional household survey, conducted by the US Department of Transportation, to look at ethnic differences in burden of travel for health care. Burden of travel was measured as greater than 30 min or 30 miles to a health care provider. Distance traveled did not vary significantly, but African Americans had higher burdens of travel as compared to Whites even after controlling for mode of travel and SES. In contrast, a study by Borders et al. [55] controlled for SES and found no significant difference in transportation barriers between rural Hispanics and Whites accessing health care in Texas.

Finally, two additional studies found differences by ethnicity, although they did not control for SES. In a study of 593 adults with cancer, Guidry et al. [26] found that Hispanics' transportation barriers to cancer treatment were greater than those of African Americans, and African Americans' barriers were greater than Whites. Transportation barriers included distance to treatment center, access to a vehicle, and finding someone to drive them to treatment. Call et al. [56] contrasted barriers to health care access between 1,853 American Indians and Whites enrolled in the Minnesota Health Care program. The study found that 39 % of American Indians reported transportation barriers compared to 18 % of Whites.

Overall, studies that explored health care access and transportation barriers among members of ethnic minorities and Whites suggested that access is superior for Whites even after controlling for SES.

Special Populations: Children, the Elderly, and Veterans—Certain populations may face unique circumstances with transportation barriers to health care access. For children, significant transportation barriers to health care access have been repeatedly identified [15, 24, 34, 39, 41, 48, 58, 59]. In two separate studies of inner-city children, 18–21 % of respondents cited transportation barriers as the reason for not bringing a child in for needed health care [15, 24]. Among migrant farm workers, 80 % cited lack of transportation as the primary reason for the last episode that their child faced an unmet medical need [34].

The elderly may face a unique combination of access barriers due to disability, illness and likely a greater need for frequent visits to their clinician. Among the elderly reporting any barrier to health care access, 3–21 % reported having transportation barriers, although insurance status and income varied among studies [9, 14, 36, 55, 60–62]. Additional studies of more low-income elderly may be necessary to clarify the role of transportation barriers to health care access.

Two studies examined transportation barriers to health care access for Veterans, a group that often has access to the federal health care system and may receive federally supported transportation assistance. In one study, 19 % of Veterans with colorectal cancer had difficulty with transportation to appointments, and a second study found that 35 % of female Veterans over age 65 had transportation barriers to health care access [23, 63].

Measuring the Impact of Transportation Barriers

Missed Clinic Appointments—Two studies selected patients for research specifically because of missed health care appointments to identify the reasons. In one study of 200 children with a history of missed appointments, 51 % parents identified transportation barriers as the primary reason for missing clinic appointments [42]. In another study, Yang et al. [41] surveyed 183 caregivers of urban children in Texas, and grouped patients based on show rates for a single appointment over a 9-week period. There was a 26 % no show rate overall. For those with a history of missed appointments, 50 % cited transportation problems compared to 30 % of those who kept appointments. Factors associated with missed appointments included not owning a car and not having access to a car.

Pharmacy and Medication Access—Five studies explored the relationship between transportation barriers and medication access with all reporting an inverse association [27, 64–67]. Kripalani et al. [64] studied patterns of discharge medication fills in 84 adults living in urban Atlanta. The study found that following hospital discharge, patients reporting difficulty visiting the pharmacy had lower prescription fill rates than those not reporting difficulty (20 vs. 55 % respectively). Additionally, 65 % of patients felt transportation assistance would improve medication use after discharge. Musey et al. [27] examined the causes for 56 diabetic ketoacidosis [DKA] admissions at Grady Memorial Hospital in Atlanta. He found that 67 % of DKA admissions were related to stopping insulin and 50 % of those patients cited either lack of money for insulin or for transportation to get their medicine.

Welty et al. [65] created an online survey through epilepsy.com to study the relationship between transportation barriers and anti-epileptic use. The study included 143 web site members and found that 45 % of respondents who could not drive said they would miss fewer doses of their medications if transportation was not a problem.

Tierney et al. [66] examined the relationship between transportation policy and health care utilization in a cohort study of 46,722 Medicaid patients, and found that restriction of Medicaid payments for transportation resulted in decreased medication refills. A study by Levine et al. [67] found that transportation barriers were associated with not being able to

afford medications, emphasizing that those with low incomes are often the hardest hit by all barriers, including transportation.

Natural Experiments—Two studies have looked at natural experiments to provide real-world insight on the impact of transportation barriers on access to care [66, 68]. One retrospective study by Pheley et al. [68] examined the impact of a 2-week mass transit strike on missed appointments at an inner-city clinic serving a low-income population in Minneapolis. There was no difference in the number of missed appointments between strike and non-strike periods with doctors, but there was an increase of 4.7 failed appointments per 100 scheduled nurse visits (relative risk 1.17).

Another study by Tierney et al. [66] looked at a Medicaid cohort to examine the impact of a policy change that restricted Medicaid payments for transportation on health care utilization. The study focused on the 6-month pre-policy period and the 6-month post-policy period for 46,722 Medicaid patients using an inner-city public hospital and associated clinics. Results revealed that visits to community clinics increased, hospitalizations increased slightly, and visits to hospital based primary care clinics, urgent care clinics, and emergency departments fell.

Discussion

This literature review on transportation barriers and access to health care yielded several important findings. First, patients with a lower SES had higher rates of transportation barriers to ongoing health care access than those with a higher SES (Table 1). Additionally, transportation barriers impacted access to pharmacies and thus medication fills and adherence. Finally, while distance from a patient to a provider would intuitively seem to be a barrier to health care access, the evidence is inconclusive.

Poorer populations face more barriers to health care access in general, and transportation barriers are no exception. In 25 separate studies, 10–51 % of patients reported that transportation was a barrier to health care access (Table 1). This is very significant because when patients cannot get to their health care provider, they miss the opportunity for evaluation and treatment of chronic disease states, changes to treatment regimens, escalation or de-escalation of care and, as a result, delay interventions that may reduce or prevent disease complications (Fig. 1).

Ultimately, transportation barriers may mean the difference between worse clinical outcomes that could trigger more emergency department visits and timely care that can lead to improved outcomes [22]. Since patients who carry the highest burden of disease face greater transportation barriers, addressing these barriers to avoid worsening health seems logical [3]. While there may be differences in transportation barriers based on ethnicity or geography, they may disappear after accounting for socioeconomic factors such as income or insurance. Additionally, studies that reported low rates of transportation barriers to health care access often did not include more vulnerable populations, such as lower income or uninsured patients.

Mixed Evidence

Some aspects of transportation barriers, such as distance, showed mixed evidence regarding the impact on health care access. Distance does not necessarily equate to travel burden and different measures of distance may alter the results. For example, studies that measured the impact of distance subjectively, by asking patients whether distance to the provider was a barrier to health care access or not, concluded it was a barrier [25, 26, 48–50]. However, other studies that objectively measured the distance between homes and health care facilities and subsequent health care utilization found distance was not a barrier [52–54]. A patient may live in a wealthy suburb, own several cars, and have no problem accessing health care, even at a distance. Conversely, a seemingly shorter distance for a patient who has to walk or cannot afford public transit may prove to be too far of a distance, and hence be identified as a barrier by the patient.

Special Populations

Existing studies on the elderly suggest that transportation is a less significant barrier to health care access compared to younger populations. However, these studies lacked inclusion of lower-income elderly populations and did not address concerns that may be more relevant to the elderly, such as safety and disability access. It is possible that the elderly may have fewer competing demands, such as not having to share a car with family members who need a car for work or transporting children. However, additional studies are needed with more representative samples of elderly adults before any conclusions can be drawn about transportation barriers to health care access in this population.

Traveling Forward: Interventions and Public Policy

Collaboration between health policy makers, urban planners, and transportation experts could lead to creative solutions that address transportation barriers to health care access while considering patient health, cost, and efficiency. Such collaboration could also lead to studies in areas that are lacking research, such as research on transportation policy and its impact on health outcomes outside of injury prevention [8]. These collaborations could also use prior research to guide interventions and public policy.

In the studies reviewed, access to a vehicle was consistently associated with increased access to health care even after controlling for SES. Future interventions should consider this link in addition to public transit discounts or medical transportation services. For example, there have been interventions that provide access to cars to improve access to jobs, and these programs could be used as models for providing cars to improve health care access [69].

Additionally, reimbursement for travel should be investigated further to determine the role it plays in keeping appointments and avoiding fragmented care. In Tierney’s natural experiment study, which examined the impact of lower Medicaid payments for transportation on health care utilization, several changes occurred in health care utilization rates. These included an increase in community clinic use and hospitalizations, with a decrease in visits to urgent care clinics and emergency departments [66].

New technological innovations such as telehealth may also address transportation barriers by reducing travel needs over time. Telehealth services may include video conferencing, remote monitoring, and other disease management support at a distance. One approach to providing patient-centered care is to evaluate transportation and other barriers to ongoing health care encounters, and provide telehealth services when beneficial and cost-effective. Medication access may also be improved as more services for home medication delivery become available.

Limitations

This review was restricted in scope and had several limitations. Studies with an exclusive focus on screening, prevention, and prenatal and pregnancy care were not evaluated and may have different findings. A majority of the studies used cross-sectional designs thus making cause and effect conclusions difficult (Table 1). The diversity of demographic, geographic, social variables, and outcome measures also make study-to-study comparisons difficult. Efforts to generate a valid measure of transportation barriers for consistent measurement may help to perform future meta-analyses across studies. Prospective studies of local changes in transportation options may also help contribute to the evidence, and although randomized trials would help isolate the impact of transportation interventions they would be impractical to execute [70].

Additionally, the studies on transportation barriers to health care access rely largely on self-report, and lacked an exploration of whether patients were unaware of available services or assistance. While some studies investigated the impact of transportation barriers on objective outcomes such as missed appointments or medication fills, these studies were in the minority. Whether transportation barriers contribute to differences in health outcomes needs to be explored further with objective outcome measures. By demonstrating that transportation barriers lead to missed appointments, poorer medication adherence, and thus poorer diabetes or blood pressure control, transportation barriers could be more strongly linked to health access and outcomes (Fig. 1).

Conclusion

Transportation barriers to health care access are common, and greater for vulnerable populations. The studies reviewed may help guide both the design of interventions that address transportation barriers and the choice of measures used in assessing their effectiveness. Future studies should focus on both the details that make transportation a barrier (e.g., cost, mode of travel, public transit safety, vehicle access) and objective outcome measures such as missed appointments, rescheduled appointments, delayed medication fills, and changes in clinical outcomes. Such studies would help clarify both the impact of transportation barriers and the types of transportation interventions needed. Millions of Americans face transportation barriers to health care access, and addressing these barriers may help transport them to improved health care access and a better chance at improved health [3].

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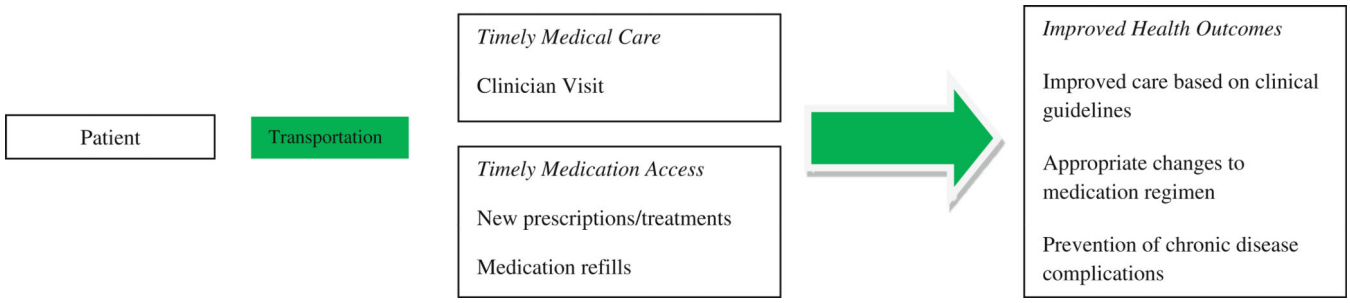

Fig. 1.
Model of relationship between transportation, health care access and outcomes

Table 1

Studies on transportation barriers to health care access

Author	Population	Methods	Measure of transportation barriers (# of items)	Results
Ahmed et al. [1]	N = 413 adults Urban (Dayton, Ohio), low SES 71 % female, 48 % Black, 42 % Appalachian	Door to door survey on barriers to health care access	"Difficulty finding transportation" (1)	"Hard" or "very hard" time finding transportation (31 %)
Arcury et al. [37]	N = 1,059 adults Rural (North Carolina), mixed SES, 662 female, 948 Whites, 112 Blacks	Retrospective, comparing transportation barriers and health care utilization	"Distance to care for… regular visit… for less serious emergency… for serious emergency" (3) Has a driver's license, any household member has a driver's license, number of vehicles owned in household, days per week spent driving, relative or friend who regularly provides transportation for a family member, knowledge of organizations that provided transportation to health care and use of such transportation (7)	Health care utilization associated with having a driver's license (OR 2.29 more visits) and having a friend or relative who provides transportation (OR 1.58 more visits)
Blazer et al. [14]	N = 4,162 adults, age 65 + Rural/Urban North Carolina), mixed SES, 62 % female, 68 % Non-Black (majority White)	Retrospective cross-sectional survey (1986/87) analyzed for urban/rural variation of health service use, satisfaction, barriers to care	Do you put off or neglect going to the doctor because of "distance or transportation"? (1)	No difference between urban and rural residents in health service use; 7.7 % delayed care due to distance or transportation
Borders et al. [54]	N = 2,097 adults, age 65 + Rural (West Texas), mixed SES 71 % female, 1949 Non-Hispanic, 148 Hispanic	Telephone survey on barriers to health care access	"Always/usually get transportation to doctor's office" (1)	Non- Hispanics (96 %) vs. Hispanics (90 %) could usually get transportation to clinic
Branch et al. [36]	N = 776 adults, age 65 + Massachusetts, 95 % Medicare, 17 % Medicaid, 61 % privately insured, 64 % female Race not reported	Retrospective survey interviews on barriers to health care access	"You did not have a way to travel to the doctor" (1)	Not having a way to get to the doctor (3 %); travel difficulties associated with lower income, being female, living alone, having less education
Call et al. [56][b]	N = 1,853 Minnesota Health Care Plan adult and parent enrollees Minnesota, 65 % female adult enrollees, 47 % female parent enrollees, 1,314 Whites, 539 American Indians	Mailed survey on barriers to health care access	"Difficulties with transportation" (1)	American Indians (39 %) vs. Whites (18 %) have difficulties with transportation
Canupp et al. [49]	N = 163 adults, mean age 26 with spinal cord injuries Birmingham, Alabama, 25 % had income greater than 25,000 dollars, 14 % female, 63 % white	Face to face survey on barriers to follow- up appointments	Obstacles for follow-up included distance to travel and availability of transportation (2)	Non-compliance with appointments associated with distance to travel ($P = 0.004$) and availability of transportation ($P = 0.033$)
Crain et al. [15][b]	N = 1,376 caretakers of children with asthma 8 metro inner-cities (locations not specified), low SES/74 % Medicaid, 36 % female, 73 % Black	Face to face survey on barriers to health care access	"Had no way to get there" (1)	No way to get to clinic for follow-up care (16 %)

Author	Population	Methods	Measure of transportation barriers (# of items)	Results
Cunningham et al. [17]	N = 2,864 adults with HIV National, mixed SES, 847 females, 1,399 White/959 Black/415 Hispanic	Face to face and telephone surveys on barriers to health care access and reasons for delaying care	"In the last 6 months, have you ever had to go without health care because you didn't have a way to get there?" (1)	Postponed care because no transportation (15.4 %) (weighted for number of HIV persons in US who were under care from January to March 1996)
Diamant et al. [18]	N = 1,819 adults Los Angeles, California, low SES, 69 % female, 56 % Hispanic/Latino, 23 % Black, 17 % White	Face to face surveys on barriers to health care access	"In the past 12 months, have you ever put off going to the doctor for medical care because you didn't have a way to get there?" (1)	Delayed care in prior 12 months (33 %) Did not have transportation to get to the doctor (12 %)
Fitzpatrick et al. [60]	N = 4,889 Medicare eligible adults, age 65 + Forsyth County, NC; Sacramento County, CA; Washington County, MD; Allegheny County, PA; mixed SES/ 70 % with supplemental private insurance, 59 % female, 83 % White	Retrospective surveys on patterns of health care use and barriers to care	"How much [moderate/very much/a whole lot] did each of the following affect your ability to see the doctor…transportation difficulty" (1)	Cited a barrier to seeing the doctor (4 %); Of those citing a barrier, 21 % had transportation difficulties Barriers to care associated with older age, female gender, minorities, lower income, lack of complementary insurance
Flores et al. [24]	N = 203 children's caretakers Boston, Massachusetts, low SES, Latino	Face to face survey on barriers to health care access	Transportation problems including lack of a car, excessive distance, expense or inconvenience of public transportation (not specified)	Transportation barrier as a reason they had not brought child in for a medical visit (21 %); most cited reason Lack of a car as most frequent transportation difficulty (62 %) Clinics located too far from home (11 %)
Giambruno et al. [25][b]	N = 157 head start health coordinators New York City, New Hampshire, Puerto Rico, US Virgin Islands	Mailed survey on barriers to medical diagnosis and treatment for head start children	Transportation barriers (4) included access to private transportation, access to public transportation, cost of transportation, distance to provider	Barriers to health care access included: Private transportation not available (67 %) Distance to provider (63 %) Cost of transit (63 %) No public transit available (48 %)
Guidry et al. [26][b]	N = 593 adults with cancer Texas, mixed SES, 56 % female, 42 % White, 40 % Black, 15 % Hispanic	Mailed survey on transportation barriers to cancer treatment	Transportation barriers (4) included distance to treatment center, access to a vehicle, finding someone to drive them to treatment, mode of travel	Barriers to getting cancer treatment were greatest for Hispanics, then Blacks, then Whites: Distance Hispanic (66 %), Black (51 %), White (37 %) Access to a vehicle Hispanic (50 %), Black (46 %), White (19 %) Finding someone to drive them Hispanic (66 %), Black (55 %), White (37 %)
Heckman et al. [44]	N = 226 adults with HIV/AIDS Urban/rural (Wisconsin), 54 % made < $10,000, 19 % female, 69 % White/23 % Black	Mailed survey on barriers to care	Transportation barriers (2) included lack of transportation and long distance to provider with likert scale ranging from l(no problem at all) to 4 (major problem)	More rural than urban patients cited problems with distance (2.86 vs 1.61 on likert scale; $P = 0.001$), transportation (2.03 vs 1.62 on likert scale; $P = 0.05$)
Hoffman et al. [19]	N = 34 adults with asthma Urban (Pittsburgh), mixed SES, 94 % female, race not reported	Mailed surveys on 10 barriers to compliance with asthma care	"Lack of transportation" (1)	Lack of transportation associated with patients who go to the emergency room for their usual place of care ($P = 0.02$)
Johnson et al. [20]	N = 34,504 honorably discharged veterans, age 18–64 National, mixed SES, American Indian/ Alaskan native, White	Analysis of National Health Interview Survey (NHIS) (1997–2006) for health care coverage and reasons for delayed care	Barriers to receiving timely care… transportation problems (not specified)	American Indian/Alaskan Native more likely to delay care than Whites due to transportation problems (OR 2.9)

Author	Population	Methods	Measure of transportation barriers (# of items)	Results
Kripalani et al. [64]	N = 84 adults Urban (Atlanta), low SES, 41 % female, 88 % Black	Telephone survey on barriers to discharge medication adherence	Level of difficulty visiting pharmacy (not specified)	Patient with difficulty visiting the pharmacy less likely to fill prescription on day of discharge (20 % vs 55 %; $P = 0.002$) Transportation assistance would improve medication use 65 %)
Kruzich et al. [48][b]	N = 102 caregivers of children receiving mental health treatment in residential facility, group home, or psychiatric unit 31 US States, mixed SES, 78 % white	Mailed surveys on barriers to participation in children's mental health treatment	Transportation barriers (3) included distance, cost of transit, lack of transit	Barriers to participation in care identified: Distance from provider (44 %) Cost of transit (28 %) Lack of access to transit (10 %) Distance was the most important barrier (22 %)
Lamont et al. [52][a]	N = 110 adults Chicago, mixed SES, 26 % female, 67 % white	Retrospective evaluation of association between cancer survival and distance from patient's residence to treating institution	Distance (N/A)	Patients living more than 15 miles from institution had 1/3 hazard ratio for death, and with every 10 miles traveled, hazard of death decreased by 3.2 % Compared with Whites, Blacks had 1/3 the hazard rate of death On average, those traveling more than 15 miles were more often white, male, college educated, had higher family incomes
Levine et al. [67]	N = 5,840 adult stroke survivors age 45 + National, SES not reported, included Blacks and Whites	Retrospective survey using NHIS data (1997–2004) to identify inability to afford medications	Lack of transportation delaying care (1)	Patients who could not afford medications more frequently reported transportation barriers (15 vs. 3 %; $P < 0.001$)
Littenberg et al. [53]	N = 781 adult diabetics, 51 % age 65 + Vermont, 58 % with private insurance/ 58 % Medicare/20 % Medicaid/5 % military/2 % uninsured, 54 % female, 97 % white	Mailed surveys, face to face interviews, and distance measurements to evaluate the role of travel burden as a barrier to insulin use	Distance (N/A)	Longer driving distance associated with less use of insulin (OR for using insulin for each km of driving distance 0.97)
Malmgren et al. [61]	N = 125 adults, age 62 + Seattle, low SES, 71 % women, 77 % White	Face to face survey on health status and access of health care and unmet needs	"Which of the following have ever made it hard to get care? … no transportation… distance too far" (2)	Problems obtaining care (46 %) No transportation (10 %) Insufficient income to meet personal needs was associated with more financial and structural barriers
Martinez et al. [58][b]	N = 107 HIV youth, age 15–24 Chicago, Newark, New York, Miami, 51 % with stable housing, 64 % female, 73 % Black	Face to face surveys on process of transitioning HIV youth from diagnosis to treatment including needs assessment and barriers to care	Barriers to accessing health care… transportation to health care settings (1)	Transportation to health care was a barrier (40 %)
Musey et al. [27][b]	N = 56 adult diabetics Urban (Atlanta), low SES, 21 women, 100 % Black	Face to face surveys on precipitating causes of diabetic ketoacidosis (DKA)	Lack of money for transportation to pharmacy (1)	DKA caused by cessation of insulin (67 %); 50 % of these patients cited lack of money for insulin or for transportation to the pharmacy
Nemet et al. [51][b]	N = 390 adults, age 65 + Rural (Orleans County, Vermont), income less than 50,000 dollars, gender and race not specified	Mailed surveys on measures of health care association	Distance (N/A)	Distance to doctor was not associated with utilization of health care
Okoro et al. [50][b]	N = 46,659 adults, age 65 + National, mixed income/all insured, 65 % female, 87 % White	Retrospective analysis of behavioral risk factor surveillance system (2002) to	Transportation barriers included no transportation or distance (1)	9 % of those who could not obtain needed medical care cited distance or no transportation as barrier to care

Author	Population	Methods	Measure of transportation barriers (# of items)	Results
		explore barriers to care for adults older than age 65		
		explore barriers to care for adults older than age 65		
Pesata et al. [39]	N = 101 children's families Midwestern metropolitan clinic (location not specified), low SES, 54 % Black, 41 % White	Telephone survey on dynamics behind missed appointments	Transportation problems (not specified)	Transportation as the primary reason for missed appointments (no ride or car) (51 %)
Pheley et al. [68][b]	N = 22,703 adult appointments Inner city Minneapolis, low SES, race not reported	Retrospective analysis of change in rate of failed appointments during public bus strike	Rate of failed appointments per 100 scheduled appointments (N/A)	Strike period associated with increased missed visits if visit was with a nurse (RR 1.17, *P* value = 0.01); no impact on doctor's visits
Probst et al. [45]	N = 2,432 households National Household Travel Survey (NHTS), mixed SES, 62 % female, 71 % White	Retrospective analysis of 2001 National Household Travel Survey to determine travel burden to health care by geography and race	Travel burdens measured by distance greater than 30 miles or time greater than 30 min; mode of travel, day and time of trip, driver/ passenger status, traffic, region (not specified)	Rural residence associated with higher travel burden by distance (OR 2.67) and time (OR 1.80) Blacks had higher travel burdens by time (OR 3.04) compared to urban residence and Whites
Rask et al. [40]	N = 3,897 adults Urban (Atlanta), low SES, 53 % female, 89 % Black	Face to face survey to determine correlation of obstacles to medical care, lack of care, or delay in care	Lack of transportation (1)	Walking or using public transportation to reach hospital more likely to not have a regular source of care (OR 1.47) If no private transportation, more likely to delay care (OR 1.60) Lack of private transportation was an independent predictor of not having a regular source of care and delaying care
Reif et al. [21][b]	N = 94 HIV case managers Urban/Rural (North Carolina), 86 % female, 59 % White	Mailed survey on barriers to health care for HIV patients	Transportation barriers (2) included lack of adequate transportation and long travel distances to health care services	Lack of transportation was a major barrier for accessing care for clients (41 %) Long travel distances to health care services was a major barrier for accessing care for clients (33 %)
Rittner et al. [62]	N = 1,083, adults, mean age 78 Metro South Florida, low SES, 838 women, 818 White, 252 Hispanic	Group administered survey on health care access barriers in an elderly population who use daytime meal programs and mostly use public transportation	Transportation barriers (not specified)	Lack of transportation was reason for not receiving care in past 6 months (6.1 %)
Rust et al. [22]	N = 30,677 adults National, mixed SES, race varied	Retrospective analysis of 2005 National health interview survey (NHIS) to explore relationship between ED visits and barriers to health care	"No transportation" (1)	Likelihood of ED visit in 1 year if at least 1 barrier vs no barrier: 1 in 3 adults (33 %) vs 1 in 5 (20 %) Of 5 access barriers, "no transportation" was greatest OR (OR 1.88)
Salloum et al. [38][a]	N = 406 adults with cancer Southeast Michigan, median income 48,000 dollars/patients had to be enrolled in a health care plan in the 1 year preceding cancer diagnosis/12 % did not own cars in household, 41 % female, 69 % White, 29 % Black	Retrospective analysis of factors associated with adherence to chemotherapy guidelines in patients with non-small cell lung cancer (2000–2007)	Transportation barriers (2) included vehicle access and distance to treatment facility	Predictors of chemotherapy underuse included lower vehicle access in the neighborhood(OR 6.96) Distance traveled was not associated with adherence to chemotherapy treatment guidelines No racial differences in the receipt of chemotherapy (neither under or overuse)

Author	Population	Methods	Measure of transportation barriers (# of items)	Results
Sarnquist et al. [47]	N = 64 adults with HIV Rural (California), majority made less than 20,000 dollars/year, 100 % female	Retrospective face to face surveys on barriers to health care	Transportation barriers (4) included mode to travel, travel time, difficulty traveling, lack of transportation	Most common reason for missed appointments was transportation barriers (37.5 %); as common as "not feeling physically well" Difficulty traveling to appointment 45.3 % Lack of transportation 31.2 % Transportation challenges associated with lower income
Silver et al. [42][b]	N = 698 adults New York City suburb, low SES, 83 % female, 73 % Hispanic	Face to face surveys on transportation barriers to clinic	Transportation barriers (6) included "how did you travel to the clinic today, (if by bus) approximately how much time did you spend on the bust to travel from your home to the clinic, have you ever missed a clinic appointment because of transportation problems, in a typical month how often do you have transportation problems, how often do you use the bus (often/sometimes/never for work/groceries/clinic or hospital/ visit family or friends), (if applies) what is the main reason that you don't use the bus more often to travel to the clinic?"	Missed or rescheduled an appointment due to transportation problems (23.5 %) Chronic transportation problems (30 %) Difficulties affording transportation to clinic (nearly 25 %) Bus users twice as likely to report history of missed/ rescheduled appointments (40 % vs. 18 % car users; $P < 0.001$)
Skinner et al. [46]	N = 38,866 households of children with special health care needs Urban/Rural (national), low SES, 83 % white, 9 % Black	Retrospective analysis from 2000 to 2002 National Survey of Children with Special Health Care Needs from the National Center for Health Statistics to examine barriers to health care needs for urban and rural special needs children	"transportation/not available in area" (1)	Transportation/service not available in area was a barrier for any kind of care (OR 1.58), for obtaining prescriptions (OR 3.58), for therapy (OR 2.50)
Smith et al. [59][b]	N = 147 caregivers of asthmatic children Urban (St.Louis, Missouri), low SES, race not reported	Scaled survey of pros and cons to primary care follow-up after ED visit for asthma	Finding transportation to get to appointment (1)	Finding transportation was a barrier for parents to obtain follow-up care
Strauss et al. [54]	N = 973 adult diabetics Vermont/New Hampshire/northern New York, 98 % insured/21 % Medicaid, 55 % female, 97 % White	Analysis of Vermont Diabetes Information System to examine relationship between driving distance and glycemic control	Driving distance (N/A)	Longer driving distances from home to site of primary care was associated with poorer glycemic control with each 22 miles of driving distance associated with a 0.25 % increase in hemoglobin Alc
Tierney et al. [66][a,b]	N = 46,722 all ages (23,015 in 1993; 23,707 in 1994) Indiana, Medicaid recipients, 66 % Black	Cohort study comparing health care utilization of Medicaid patients before (1993) and after(1994) a change in transportation reimbursement policy	Health care utilization (N/A)	Visits to hospital based primary care clinics declined (16 %) Visits to neighborhood health clinics increased (7 %) Emergency and urgent care visits fell (8%) Visits for medication fills fell (18 %) Hospitalizations increased slightly with no change in number of inpatient days
Wallace et al. [3]	N = 5,000 (2002 National transportation availability and use survey by bureau of transportation statistics- BTS)[c]	Retrospective analysis of BTS, NHIS, MEPS to estimate magnitude of transportation	Transportation barriers National health interview survey (1) MEPS (3)	3.6 million Americans (estimated) miss at least one medical trip a year because of transportation and population is more likely to be older, poorer, female, minority, less educated

Author	Population	Methods	Measure of transportation barriers (# of items)	Results
		barriers to health care and population affected nationally barriers to health care and population surveyed (not specified)	Not defined specifically transportation availability and use	53.7 % of children who missed care due to transportation live in metro areas of 1 million or more while only 47.5 % of all U.S. children live in these areas
Washington et al. [63]	N = 3,611 adult veterans National, mixed SES, 100 % female, 23 % minorities	Telephone survey of barriers to health care access	Reason for delayed care or unmet need… transportation difficulties (1)	35.7 % of those over age 65 reported transportation difficulties
Weathers et al. [34]	N = 300 adult caretakers of a migrant child less than age 13 4 counties in Eastern North Carolina, 73 % of children lacked insurance, nearly 70 % children were foreign born (62 % from Mexico)	Face to face surveys of factors associated with unmet medical needs for children of migrant workers	Primary reason for the last episode of unmet medical need… lack of transportation (1)	53 % of children had unmet medical need Lack of transportation was primary reason for last episode of unmet medical need (80 %)
Welty et al. [65]	N = 143 adult members of epilepsy.com with epilepsy Worldwide, (119 US/24 outside US), 75 % female, SES not reported, race not reported	Web survey on impact of limited transportation on medication adherence	Transportation as a barrier to medication access (8) including "approximately how far from your home is your pharmacy located (miles); if you do not drive, are there other forms of transportation available; what best describes your primary mode of transportation, do you ever have trouble picking up prescription medications on time because of transportation problems, how often do transportation problems keep you from getting your prescription medications on time, how often do you ever miss doses of medication because you cannot get to the pharmacy to pick up your medications, do you believe you have seizures because you are not able to pick up your medications on time, do you feel you would miss fewer doses of medication if transportation was not an issue?"	Patients who could not drive vs those who could: Trouble picking up medications on time due to transportation barriers (51 % vs 20%) Would miss fewer doses if transit not an issue (45 vs. 22 %) Thought had seizures because did not get medications on time (28 vs. 18 %) Living closer and having mail service pharmacies did not improve receipt of on time refills
Wheeler et al. [33]	N = 303 recently hospitalized adults with diabetes Urban (Atlanta), low SES, 46 % female, 91 % Black	Face to face surveys on barriers to follow- up diabetes care after hospital discharge	"no transportation to get to doctor" (1)	Most common barrier to follow-up care was no transportation (60 %)
Yang et al. [41]	N = 183 caregivers of children attending pediatric clinic Urban (Houston, Texas), low SES/80 % Medicaid, 44 % Hispanic, 28 % African Americain	Face to face and telephone surveys of transportation barriers to keeping appointments	Transportation barriers (16) included "forms of transportation most often used to clinic, form of transportation to last appointment kept, travel time in minutes to clinic for last appointment kept, usual travel time to clinic, number of missed appointments in last 12 months due to transportation problems" and yes/no items included "ever used Houston buses, access to a car, cost of transportation too high in Houston, difficulty getting to last appointment, ever missed appointment due to transportation problem, ever taken a child to a closer clinic, ever late to appointment due to transportation problem, ever miss appointment because auto being used by other person, ever	Overall, 131 missed appointments out of 497 appointments (26.4 %) *Kept appointment:* Access to a car (82 %) Missed in past due to transportation problems (30 %) 31 % of the show group missed appointments in the past due to reasons other than transportation *Did not keep appointment:* Access to a car (58 %) Missed in past due to transportation problems (50 %) 56 % of the no show group missed appointments in the past due to reasons other than transportation

Author	Population	Methods	Measure of transportation barriers (# of items)	Results
			not schedule appointment because of transportation problem, ever miss sick visit because of transportation problem, ever lat	
			not schedule appointment because of transportation problem, ever miss sick visit because of transportation problem, ever lat	
			not schedule appointment because of transportation problem, ever miss sick visit because of transportation problem, ever lat	
			not schedule appointment because of transportation problem, ever miss sick visit because of transportation problem, ever lat	
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			not schedule appointment because of transportation problem, ever miss sick visit because of transportation problem, ever lat	
			not schedule appointment because of transportation problem, ever miss sick visit because of transportation problem, ever lat	
Zullig et al. [23]	N = 954 veterans with colorectal cancer Minnesota, mixed SES, 100 % male, 76 % White	Mailed survey on transportation barriers to cancer treatment and follow-up	"How often was it difficult to get transportation to or from your treatment or follow-up appointment?"	"Often" and "always" difficult (19 %)

[a] All studies are cross-sectional, unless otherwise noted under author. If question stem was available, it was provided in quotations. Focus group studies, review articles and policy papers were not included in this table

[b] Study did not correct for SES by income or insurance, although in some cases this correction may not be applicable

[c] Sample size not reported by article for 2002 National Health Interview Survey-NHIS and 2001 Medical Expenditure Panel Survey-MEPS

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Transportation-related barriers to care among African American women living with HIV/AIDS: “What you getting out of the cab for?”

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Abstract

Transportation-related problems have been consistently reported as barriers to accessing and remaining in HIV medical care, particularly among African American women living in under-resourced areas. With emphasis on the Southern region of the United States, this commentary presents a brief overview of the HIV/AIDS epidemic among African Americans, barriers to remaining in HIV care, and pilot data from a study conducted among African American women living in Mississippi. A small focus group study was conducted to examine the relative influence of transportation-related barriers on attendance and motivation to attend HIV medical care appointments. Eight African American women (mean age of 43.50, *SD* = 10.82) who were engaged in medical care participated in one focus group session. Time since diagnosis ranged from 6 to 17 years. Participants reported transportation-related barriers that were generally consistent with previous research, including lack of personal transportation, limited financial resources to pay family and friends for transportation or gasoline, and inconveniences associated with sharing van services with other patients. Participants appeared to have learned how to successfully navigate these barriers in order to remain in care. Interestingly, participants reported significant fear of disclosure related to use of transportation services provided by insurance providers and community organizations. Specifically, many of the women indicated that family, friends, and neighbors questioned them about where they were going and why they used taxis. These types of encounters might influence whether individuals utilize available transportation services. Participants provided several recommendations for improving the transportation system. Additional research is warranted to obtain a more representative sampling of opinions among African American women living in under-resourced areas.

Introduction

African Americans living in the United States are disproportionately affected by the human immunodeficiency virus (HIV) and, the life-threatening stage of infection, acquired immune deficiency syndrome (AIDS) (Centers for Disease Control and Prevention [CDC], 2012a). Comprising only 12% to 14% of the U.S. population, African Americans are significantly

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more likely to contract HIV, receive a diagnosis of AIDS, and experience HIV/AIDS-related death (CDC, 2012a; Levine et al., 2007). Moreover, African American women accounted for 29% of new HIV diagnoses in 2010 (CDC, 2012a). African Americans are less likely to be in care, less likely to achieve viral suppression, and more likely to be nonadherent to their medication regimen, which increases the likelihood of developing drug resistance, poorer immune functioning, higher levels of the virus in the blood, and risk of HIV transmission to others (Klimas, Koneru, & Fletcher, 2008; Singh et al., 1996; Heckman et al., 1998; Singh et al., 1999). Although there have been significant medical advances since the approval of powerful anti-HIV medications in 1996, such as overall reduction in HIV/AIDS-related deaths, mortality rates among African Americans have worsened. More specifically, mortality incident rate-ratios between African Americans and Whites have increased since treatment became available, and African American women of all ages were at least 13-times more likely to die from HIV compared to same-aged White women (Levine et al., 2007). In other words, more African Americans have died after the introduction of life-saving treatments available than before anti-HIV medications existed.

Additionally, there are notable regional distinctions in the U.S. epidemic. In 2010, African Americans living in the South accounted for 45% of new AIDS diagnoses in the U.S. (South: AL, AR, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV; CDC, 2012b). The health, social, and economic disparities that have historically affected African Americans living in the South contributes to barriers related to accessing healthcare in general, and HIV medical care, in particular (Pence et al., 2007). Lack of relevant services (e.g., medical care; mental, substance, and spiritual counseling; housing, financial resources and transportation) has been documented as a significant barrier to accessing and maintaining proper HIV medical care in the South (Reif, Whetten, Lowe, & Osterman, 2006). Furthermore, any one or combination of these barriers may directly and/or indirectly impact the management of HIV disease.

Vulnerable populations, such as ethnic minority women living in under-resourced areas, face significant challenges that influence engagement and utilization of HIV medical care services. Transportation is often identified as a barrier to care. Many patients in both rural and urban areas do not have personal transportation and rely on public transportation, community organizations, or insurance providers. A sample of women living with HIV in Alabama reported the following transportation barriers to accessing HIV medical care: distance from care, lack of personal transportation, limited financial resources for bus or taxi fare, gasoline for personal vehicles, or payments to family and friends for a ride, not wanting to disturb or inconvenience others by asking for transportation, and long travel times when transportation is provided for multiple persons using van services (Moneyham et al., 2010). Konkle-Parker, Amico, and Henderson (2011) assessed barriers to care among 130 HIV-infected persons (62% males and 81% African American) at an infectious disease clinic in Mississippi. They found that 20% of the sample reported an inability to get transportation as a barrier to remaining in HIV medical care, and 13% reported it as the main reason for dropping out of care.

Method

To gain more insight into African American women's experiences with transportation-related barriers to care, we conducted a small pilot study with African American women receiving HIV medical care in Jackson, Mississippi. Supported by a grant from the Institute of Multimodal Transportation, we conducted a focus group study in order to learn more about the relative effect of transportation-related barriers on motivation and utilization of available HIV medical services. The group consisted of 8 African American women diagnosed with HIV. The mean age was 43.50 (*SD* = 10.82). All of the participants earned at least a high school diploma or GED, and six reported having some college/graduated college. Most were unemployed, dating or married, and earned less than $10,000. Time since diagnosis of HIV infection ranged from 6 to 17 years; seven were prescribed anti-HIV medications. Participants completed a socio-demographic questionnaire and a focus group questionnaire, developed based on review of the literature and consultation with Drs. Bryman Williams (Jackson State University) and Debbie Konkle-Parker (University of Mississippi Medical Center), who have expertise in the area of HIV research and conducting qualitative research. Participants received $25 asreimbursement for their time and transportation. The study was approved by the Jackson State University Institutional Review Board.

Results and Discussion

Half of the participants had their own transportation, and the remainder relied primarily on public or insurance-provided transportation. Three women had a history of missed appointments due to lack of money to pay someone for a ride (payments ranged from $5 to $25). Two women reported that transportation problems caused them to miss HIV medical appointments *occasionally* in the past 12 months. Half of the sample believed that their motivation to seek HIV medical care was impacted by transportation-related problems *some of the time* to *often*.

Public Transportation

Among those without personal transportation, participants often used bus or taxi services. Advantages of using public transportation included: cost effectiveness, saving gasoline, bus transportation has more anonymity in terms of where they are going and why, bus has predictable schedule. Disadvantages of using public transportation included: thoughts and feelings of paranoia, taxi drivers may not know where to go, taxi may take too long or not come at all.

Shared Transportation

Community organizations and insurance providers often use vans or small buses to pick up a group of patients at their homes and take them to and from their appointments (i.e., shared transportation). Participants reported several frustrations associated with shared transportation services. Many reported that they don't always use free transportation services due to inconsistency and inconvenience of arrival and departure times (e.g., arrive too early), numerous steps required to contact the driver (e.g., must call a 1–800 number,

call gets transferred, and a dispatcher contacts the driver), and long wait for other van riders to finish their appointments. Participants indicated that it might be more conducive for them to ride the bus because of the predictable schedule, especially when they are not feeling well. Some participants indicated that they would do all they could to take care of themselves (e.g., take over-the-counter pain medicine) in order to prevent calling the ambulance, whereas other participants reported calling the ambulance when they felt ill and they had no other transportation options.

Public or Shared Transportation and Fear of Disclosure

Some expressed fear of disclosure of HIV status if another passenger liked to talk to the bus/taxi driver about where they are going and why, and if they are identified using a particular type of taxi, van, or government vehicle. Participants also noted that other people might ask questions about the taxi, “Where are you going in the cab?” “What you getting out of the cab for?” Some participants stated that they would ignore those questions, whereas others stated that they would tell inquirers to mind their own business. One participant explained that some individuals would “stay at home and die rather than to be identified by a cab or the van or even coming to pick up their medication. They just don’t want to be identified.”

Family, Friends, Neighbors

Participants reported that they would also ask family, friends, or neighbors for a ride to their appointments. This usually required reimbursement to the driver for gas, which has become increasingly difficult with rising gas prices. Participants also reported that payments for a ride were especially difficult because of fixed incomes and the number of appointments they have for various healthcare needs and other obligations. Participants were less likely to ask someone for a ride again if that person asked a lot of questions about where the participant needed to go and why. Furthermore, participants reported difficulty asking someone to take them to their appointment because of the necessity of accounting for both driving and waiting time.

Recommendations

Our study participants made several recommendations when asked, “If you were governor for the day what changes would you make to the transportation system in Mississippi?” Participants reported that they would ensure anonymity of transportation vehicles (i.e., no slogans or company names). They also suggested that insurance providers and community organizations provide individualized transportation since payment is provided on a per-person basis, ensure patients are picked up on time and can depart when they are finished, and give patients the option of waiting on others to finish their appointments, as some women didn’t mind waiting if they were not feeling ill. Participants also recommended that the bus system run 24 hours a day, seven days a week, so they can get to the hospital if they become sick in the middle of the night.

Motivation

Participants expressed motivation to do what is necessary to attend appointments because of their desire to live, stay healthy, and prevent high medical expenses associated with

emergency care, particularly for those without insurance. Participants expressed motivation to take anti-HIV medications. One respondent stated, "…I have seen so many friends and people that I work with just die. So, I know the results of not taking this medication. So, it's not even an option to me. You know it's not *if* [emphasis added] I'm going to take it. I'm going to take it."

In conclusion, this small pilot study is limited by sample size, but provides insight into the lived experience of some African American women living with HIV. Transportation barriers are an important consideration among vulnerable populations in under-resourced areas. Research has shown that directly addressing transportation by providing bus tickets and reimbursement for taxi or personal vehicle mileage can influence service utilization and motivation to remain in care (Whetten et al., 2006). The women in this study appeared to have been relatively successful in managing transportation-related barriers. The transportation-related barriers reported were similar to those reported by women in previous studies, including lack of personal transportation, limited financial resources to pay family and friends for rides or gasoline, and inconveniences associated with sharing van services with other patients. Unlike previous studies, participants endorsed significant fear of disclosure associated with shared transportation services, and were especially concerned about the use of marked vehicles (e.g., company logos). Additional research is warranted to obtain a more representative sampling of opinions. Nonetheless, as the U.S. deals with ever-increasing fiscal uncertainty and budget cuts to existing healthcare programs, African American women living with HIV in under-resourced areas might experience greater challenges related to transportation. Service providers and policy makers must attend to and advocate for the basic needs of our most vulnerable patients in a manner that is sensitive to the myriad of issues, such as those addressed in this commentary, that influence their ability to stay in care.

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The Importance of Non-Emergency Medical Transportation

By Andrea Avery | Submitted On March 25, 2016

According to a study completed by Community Transportation Association, some 3.6 million people in the United States miss a doctor's appointment or put off going to the doctor simply because they do not have any way to get there. Of that 3.6 million, 950,000 are children. Most of these individuals are low-income and lack a working vehicle. While larger areas have affordable public transportation, not everyone lives in these areas. However, for those with low-income, non-emergency medical transportation (NEMT) options are available.

Because low-income patients fall through the gaps, the NEMT benefits fill those gaps. In some cases, ambulances are utilized to help patients get to where they need, especially if they are coming from a nursing home. However, subsidies in certain areas allow patients to take taxis, vans, or car services to get to their appointments.

Spending a Little to Save a Lot

Studies indicate that by providing non-emergency medical transportation for routine appointments, Medicaid and Medicare can actually save money. Of course, there is an investment necessary for the system to work. Despite the increased cost, it has been shown that the investment is returned. These studies show that providing this service saves an average of $367 per person.

Routine non-emergency medical transportation is approximately fifteen times cheaper than if that same patient took an ambulance to the emergency room for treatment. On average, the NEMT services only account for 10 percent of the total Medicaid patient base. The expenses total only one percent of the department's expenditures.

Additional studies conducted by Florida State University determined that even if just one percent of all funded NEMT trips ended with the person going to a doctor's office instead of the emergency room, the state would see a return of 1108 percent. This is approximately a return of $11.08 for each dollar spent by state agencies.

Keeping In Line With the Affordable Care Act

Providing non-emergency medical transportation is key to staying in line with the Affordable Care Act. The ACA requires that Medicaid coverage is available for all low-income American citizens. It is an important part of the US having an effective and efficient health care system.

In recent changes to Medicaid, the Center for Medicaid and Medicare Services made providing consistent access to medicinal treatments a mandatory benefit. This change is an effort to provide effective management for the escalating costs associated with hospital costs. It is also an important aspect to ensure general health care gets to those who need it most.

It is important to offer non-emergency medical transportation to those who need it most to keep American citizens healthy. Thanks to new laws and regulations, the NEMT benefits serve as the lifeblood of Medicaid. Additionally, it reduces the financial burden of the state and federal government by avoiding ambulance transportation and emergency room visits that could have been avoided if there had been an alternate means of transport.

When considering non-emergency medical transportation, Cape Cod residents visit Caliber Patient Transport. Learn more at http://www.caliberpatienttransportcc.com/services/.

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