

Driving Access: The Imperative for Hospitals to Invest in Patient Transportation

by

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Abstract

Transportation barriers have been identified as a key social determinant of health. Often, patients with disabilities and elderly patients are disproportionately affected by these disparities in health. With healthcare systems increasingly focused on expanding access to care and addressing health disparities, systems should consider implementing transportation programs to address the needs of their patients. Investment into these programs by healthcare systems has the potential to provide significant improvements for the health of patients and substantial financial benefits stemming from those health improvements. Transportation access and the reduction of transportation barriers have clear public health relevance as transportation barriers are intrinsically related to health inequities.

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Preface

As the topic of person-first language has been heavily debated throughout disabled communities and academic institutions, I have chosen in this paper to use the direct wording of each resource utilized.

I would like to thank Mike Evans and Dr. Taylor Abel for their invaluable feedback throughout the writing process. I want to also thank Julie Hecker and the entire team at UPMC Mercy, who saw potential in me and invested their time into my personal and professional development. Finally, I would never have gotten this far in life without the everlasting support of my parents, whom I am grateful for every day.

1.0 Introduction

Access to transportation plays a pivotal role in contributing to health outcomes, with elderly and disabled populations disproportionately impacted by transportation disparities. It is estimated that every year, 3.6 million people do not obtain necessary medical care due to transportation barriers (American Hospital Association, 2023). People with disabilities are over twice as likely to report experiencing inadequate transportation when compared to people without disabilities, at a rate of 34% and 16% respectively (Krahn et al., 2015). It is estimated that 1/3 of older adults do not drive and that around 1/3 of older adults who can drive have restrictions on their licenses (Saxon et al., 2019). Therefore, a sizable number of older adults must rely on family members, public transportation, or transportation solutions (such as private van programs or taxis) to travel to appointments.

Disability and age have a strong relationship. As shown in Figure 1, nearly half of Americans ages 75 and older and almost a quarter of individuals aged 65-74 reported having a disability. This is in contrast to 8% of individuals aged 18-34 and 12% of individuals 36-64 (Leppert & Schaeffer, 2023). America is facing a rapidly aging population. Figure 2 displays the change in population size from 2010-2020. The population size of Americans aged 65-74 rose by 11%, and there were population increases within every category over the age of 65 (Caplan, 2023). The census has projected that the population share of elderly Americans will only continue to rise as Baby Boomers reach retirement age. This indicates that the impact of transportation needs will continue to be a rising concern within healthcare.

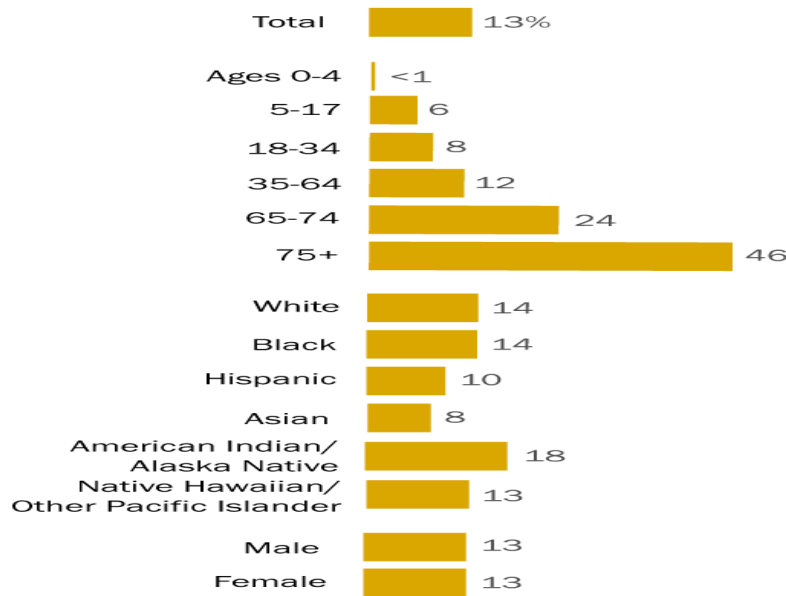
There have been attempts to address transportation barriers throughout the country, ranging from state-sponsored, insurer-driven, or system-based. However, these programs (such as

Medicaid’s Non-Emergency Medical Transport Program) are often exclusionary. Because of these exclusions, patients who need to access transportation programs may be unable to receive care.

Implementing transportation programs can decrease transportation barriers for patients, while also being cost-effective compared to the current state (having no transportation program in place). Decreasing no-show rates attributed to transportation issues can save the cost of an unnecessary or preventable emergency department visit for payers and providers (Guo et al., 2021). Payers and systems must also consider the negative impact missed appointments can have on patient’s health outcomes (McQueenie et al., 2019).

46% of Americans ages 75 and older report having a disability

% of Americans reporting a disability



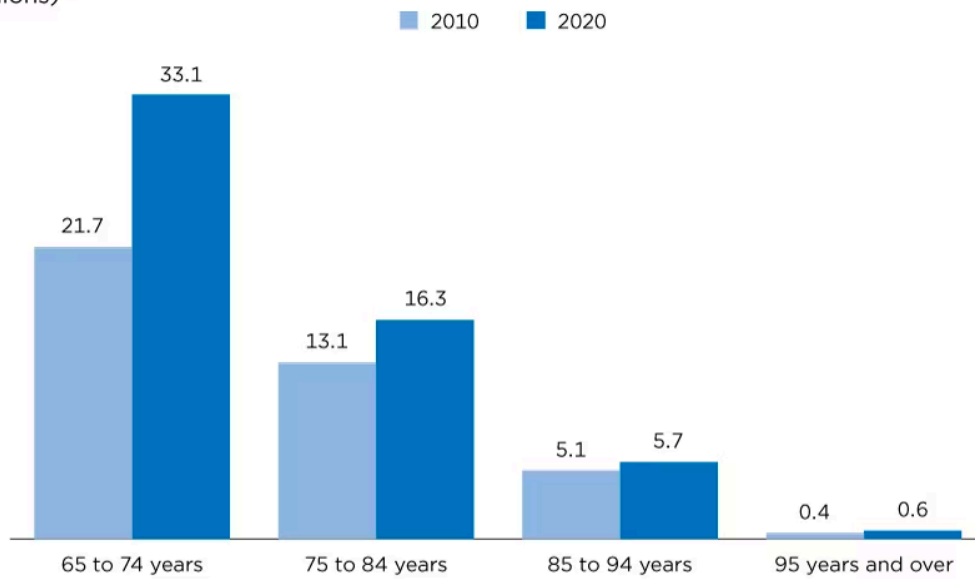
Note: Based on total civilian noninstitutionalized population. Racial groups include only single-race non-Hispanics. Hispanics are of any race. Those who did not specify their race not shown.

Source: U.S. Census Bureau, 2021 American Community Survey 1-year estimates.

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Figure 1. 46% of Americans Ages 75 and Older Report Having a Disability

Figure 3.
Population Size of Older Age Groups: 2010 and 2020
(In millions)



Note: For information on data collection, confidentiality protection, nonsampling error, and definitions, refer to <https://www2.census.gov/programs-surveys/decennial/2020/technical-documentation/complete-tech-docs/demographic-and-housing-characteristics-file-and-demographic-profile/2020census-demographic-and-housing-characteristics-file-and-demographic-profile-techdoc.pdf>.

Source: U.S. Census Bureau, 2020 Census Demographic and Housing Characteristics File (DHC).

Figure 2. Population Size of Older Age Groups: 2010 and 2020

2.0 Literature Review

2.1 The Role of Transportation as a Social Determinant of Health

Transportation has been recognized as a key social determinant of health by the American Hospital Association and the American Public Health Association. The American Public Health Association describes the role of transportation as a social determinant of health as “directly linked with built environment factors, such as location and infrastructure... however, transportation also affects our abilities to access jobs, education, healthy food, social engagements, faith-based institutions, and health care” (Schweninger et al., n.d.). In comparing this with Figure 3 below, transportation can negatively impact each main social determinant of health (Artiga & Hinton, 2018).

The ripple effect of transportation access impacts patients with disabilities, people of color, and the elderly more acutely. The National Health Interview Survey found “a strong association between functional limitation status and transport-delayed care above and beyond any sociodemographic or other health characteristics” while noting that Hispanic and Black patients had greater odds of reporting transportation barriers (Wolfe et al., 2020).

These barriers only heightened during the COVID-19 Pandemic. Table 1 below displays patients who arrived late, delayed care, or missed care due to transportation barriers between 2020-2021. This survey highlights the disparities in missed care for patients with disabilities, non-white patients, and patients who live in areas without nearby care (Cochran et al., 2022). Access to transportation affects a patient’s entire continuum of care. If a patient is unable to travel to an

appointment reliably, they are also likely to be unable to access essential services such as pharmacies, which may have a profound impact on health.

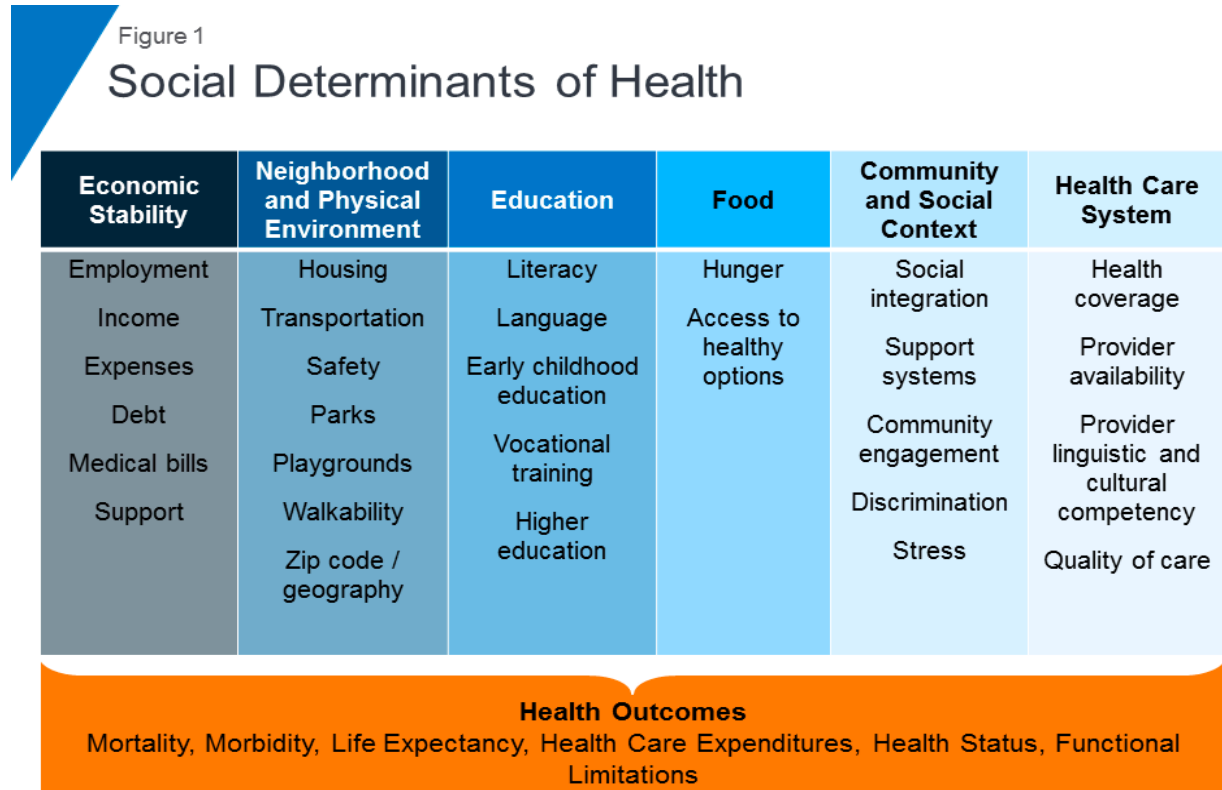


Figure 3. Social Determinants of Health

Table 2 Prevalence of having arrived late, delayed care, or missed care due to transport barriers by covariates (N= 323)

From: [Transportation barriers to care among frequent health care users during the COVID pandemic](#)

	Arrived Late	Delayed Care	Missed Care	Late, Delayed, or Missed Care
All	53 (16.4%)	114 (35.3%)	59 (18.3%)	126 (39.0%)
Age	***	***	***	***
18–64	38 (30.4%)	67 (53.6%)	45 (36.0%)	74 (59.2%)
65 plus	15 (7.6%)	47 (23.7%)	14 (7.1%)	52 (26.3%)
Gender		***		***
Female	36 (19.3%)	78 (41.7%)	39 (20.9%)	87 (46.5%)
Male	17 (12.5%)	36 (26.5%)	20 (14.7%)	39 (28.7%)
Race			*	
White	42 (15.7%)	91 (34.1%)	44 (16.5%)	103 (38.6%)
Non-White	11 (19.6%)	23 (41.1%)	15 (26.8%)	23 (41.1%)
Disability	***	***	***	***
Has one or more disabilities	48 (22.7%)	97 (46.0%)	51 (24.2%)	107 (50.7%)
Has no disability	5 (4.5%)	17 (15.2%)	8 (7.1%)	19 (17.0%)
Household Vehicle(s)	**	***	***	***
No household vehicle	7 (38.9%)	16 (88.9%)	10 (55.6%)	17 (94.4%)
Has household vehicle(s)	46 (15.1%)	98 (32.1%)	49 (16.1%)	109 (35.7%)
Medical clinics in home ZIP	**	*	***	**
0	26 (25.7%)	45 (44.6%)	32 (31.7%)	51 (50.5%)
1–5	17 (12.5%)	42 (30.9%)	14 (10.3%)	46 (33.8%)
6–10	8 (15.4%)	19 (36.5%)	9 (17.3%)	21 (40.4%)
11 plus	2 (5.88%)	8 (23.5%)	4 (11.8%)	8 (23.5%)
Appointments in Past Year	**			
1–5	12 (13.6%)	29 (33.0%)	15 (17.0%)	32 (36.4%)
6–10	13 (11.3%)	41 (35.7%)	16 (13.9%)	43 (37.4%)
11–15	9 (17.6%)	16 (31.4%)	11 (21.6%)	18 (35.3%)
16 plus	19 (27.5%)	28 (40.6%)	17 (24.6%)	33 (47.8%)

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$ based on Fisher's exact test

Table 1. Prevalence of Having Arrived Late, Delayed Care, or Missed Care Due to Transport Barriers by Covariates

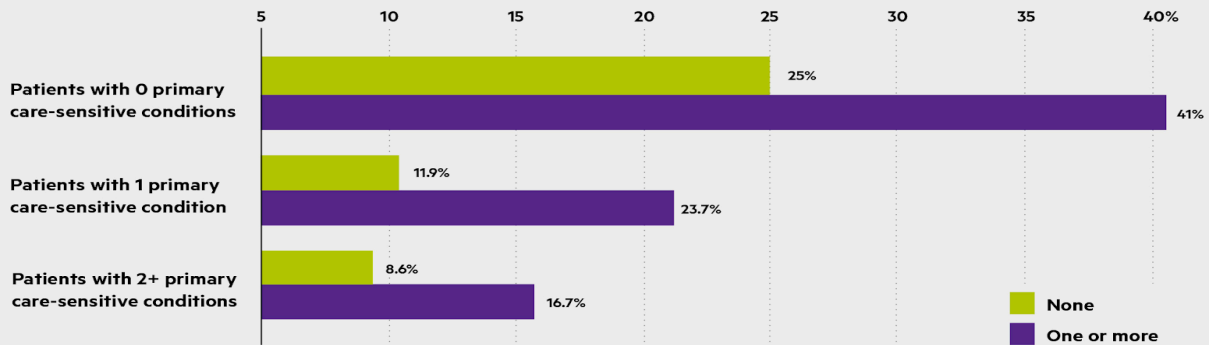
2.2 Missed Appointments in Relation to Health

Missed appointments are associated with negative health outcomes. In a study performed using NHS data, researchers reported that “repeated missed appointments were associated with increased mortality rates, and patients with long-term conditions who missed two or more appointments had a 3x increase in all-cause mortality compared to patients who missed no appointments” (McQueenie et al., 2019). This data is concerning, as patients most likely to miss appointments are at-risk groups such as elderly, non-white, and disabled populations.

In the National Health Interview Survey, patients who reported “poor” health had a 2.3-percentage-point increase in the probability of transport-delayed care when compared to patients who reported “excellent” health (Wolfe et al., 2020). Similarly concerning, the study found that people who had 4+ ED visits reported transportation barriers to all care at a rate significantly higher than people who had zero visits to the ED (Wolfe et al., 2020). Athenahealth studied primary care visits across 1,626 primary care practices and found (displayed in Figure 4 below) that patients with at least one primary care-sensitive condition nearly doubled their attrition rate by having one or more no-show appointments (Hayhurst, 2019). Primary care-sensitive conditions can include diabetes, hypertension, asthma, COPD, and congestive heart failure (Gibbons et al., 2012). Athenahealth also found that when solely accounting for age, missing one or more appointments doubled the attrition rate in patients aged 61 and older (Hayhurst, 2019). The comparison between age and attrition can be further examined in Figure 5.

For patients with primary care-sensitive conditions, no-shows double attrition

Practice attrition percent by number of no-show appointments per patient, by number of primary care-sensitive conditions



Patients that had at least one no-show in the 18-month period before the current appointment have a higher practice attrition rate than patients who had no no-shows in the 18-month period before the current appointment.

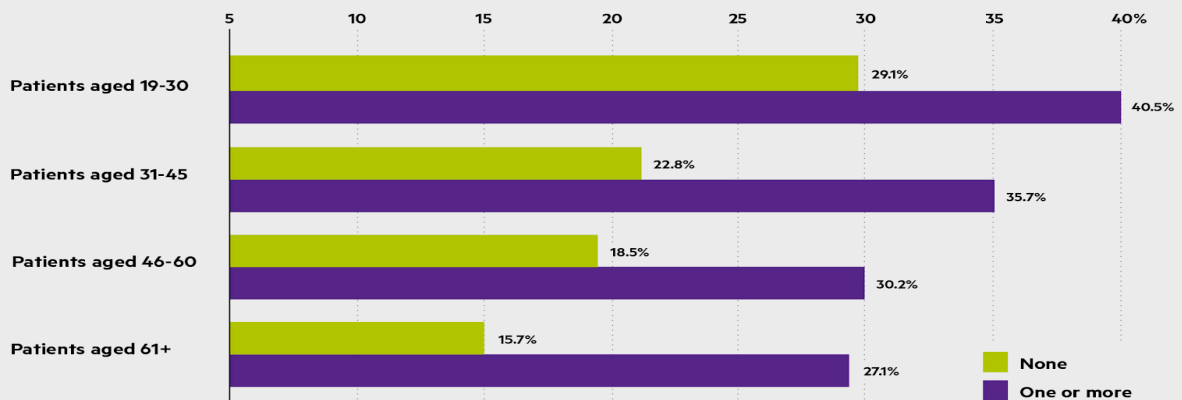
Source: athenahealth

Sample: ~3.5 million visits of ~2.5 million patients to 1,626 providers across 249 contexts.

Figure 4. For Patients With Primary Care-Sensitive Conditions, No-Shows Double Attrition

As patients age, even one no-show substantially increases attrition

Practice attrition percent by number of no-show appointments per patient, by age group



Patients that had at least one no-show in the 18-month period before the current appointment have a higher practice attrition rate than patients who had no no-shows in the 18-month period before the current appointment.

Source: athenahealth

Sample: ~3.5 million visits of ~2.5 million patients to 1,626 providers across 249 contexts.

Figure 5. As Patients Age, Even One No-Show Substantially Increases Attrition

2.3 Potential Cost Savings for Hospital Investment into Transportation

Addressing missed appointments has potential benefits for healthcare organizations and payers. Missed appointments are estimated to cost the U.S. healthcare system \$150 billion annually (Jain, 2021). On a smaller scale, one missed appointment is estimated to cost individual physicians an average of \$200 (Jain, 2021). In Figure 6 below, Athenahealth found that attrition increases by nearly 70% after one or more missed appointments (Hayhurst, 2019). This represents lost future revenue associated with the initial missed appointment cost.

High-cost unnecessary emergency department visits may be reduced by addressing transportation barriers. People who made 4 or more visits to the emergency department per year reported transportation barriers at a 9x higher rate than those with 0 visits (Wolfe et al., 2020). Providing patients transportation access to primary care visits could allow patients access to necessary preventative care. With this access, a patient's condition may not escalate to an emergency room visit, or the patient would not be forced to utilize the emergency department for primary care treatable conditions. This is a potentially large cost savings for health systems. UnitedHealth Group estimates that a primary care or urgent care visit instead of an emergency department visit saves systems and insurers an average of \$1,800+ per visit (UnitedHealth Group, 2019).

Reinvesting a portion of those potential savings into funding transportation can be a net benefit to health centers. The cost-benefit of investment in patient transportation can be seen in the HealthTran Missouri case study. Between November 2014 and August 2015, HealthTran provided 2,470 rides to Ozark Medical Center's (OMC) patients. The cost of implementing this program was ~\$95,000 (including drivers, vehicles, and overhead), and Medicare reimbursements received by OMC were \$467,309 (Rural Health Information Hub, 2018). That is a net gain of \$372,309 for

appointments patients indicated that they would otherwise have not attended without HealthTran's assistance. Once the program hit 17 months of operation, estimated appointment revenue rose to over \$730,000 (Rural Health Information Hub, 2018).

Investment into safety net clinics where patients often are uninsured or underinsured is still a financial benefit for systems, University of Texas at Austin researchers found. Researchers collected patient data from the Family Health Center (FHC) in San Antonio, Texas on transportation barriers impact on no-show rates at the clinic, the relationship between the no-show visits and emergency department visits, and costs associated with these outcomes. Figure 7 below displays the probability tree diagram created of the patients studied, with the cost outcomes associated with each path (Guo et al., 2021). This research displayed that patients who missed an appointment were more likely to have an emergency department visit within 30 days, while also being more likely to be admitted into the hospital. When calculating the cost savings in adopting a plan with the maximum amount of transportation coverage (Uber/Lyft credits, taxi coverage, shuttles, bus passes, and golf carts to and from bus stops), costs totaled around \$16,000 per month for FHC. Reducing missed appointments by just 20% saw a maximum cost savings of around \$25,000 per month, making the full maximum coverage program still financially viable (Guo et al., 2021). Reducing the missed appointment rate by the goal rate of 25% saw an even higher financial return for the clinic, making a compelling case for the adoption of the program.

Systems struggling with initial costs may choose to take the approach of Taylor Regional Hospital in Campbellsville, Kentucky. Taylor Regional Hospital (TRH) partners with 14 local organizations, who provide \$80 each per month for gas for the vans. TRH is responsible for the employment of the van driver and van maintenance and holds annual fundraisers to subsidize the purchase of a new van every two years (American Hospital Association, 2018). Systems may also

have the ability to partner with insurance companies, which would be incentivized by improvements in their patient's health (and the cost savings associated).

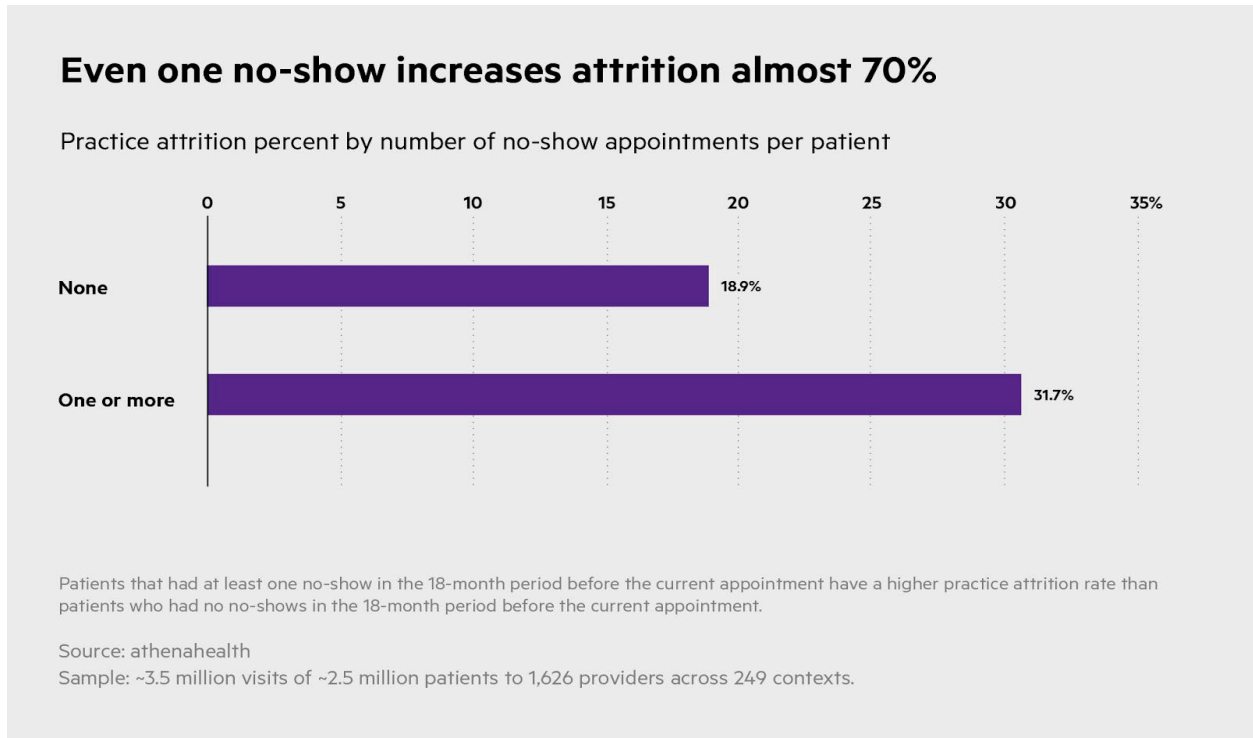


Figure 6. Even One No-Show Increases Attrition Almost 70%

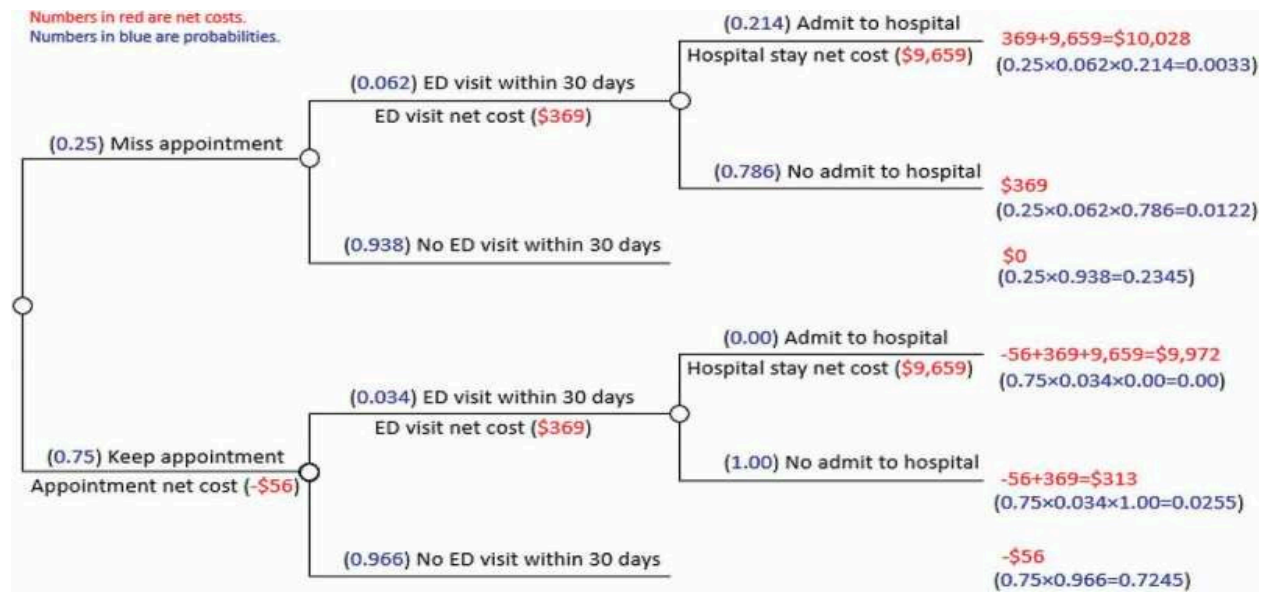


Figure 7. Probability Tree Diagram

3.0 Current Programs

3.1 Non-Emergency Medical Transport Program

The Non-Emergency Medical Transport Program (NEMT) is a benefit for Medicaid users who need transportation to and from medical appointments (CMS, 2023). Qualifying for this benefit varies from state to state. Table 2 below displays that some states require copayments while others do not, and some states place limitations on accessing the service (KFF, 2019). Restrictions can include requiring the patient to not have a vehicle or a driver's license, having a physical, cognitive, mental, or developmental limitation, or a prescription from a provider (CMS, 2023). Some states may also limit the amount of rides a patient can receive (KFF, 2019).

There are other access issues within the program as well. Patients may be unaware that the service exists, and may require assistance from a social worker to enroll (Chaiyachati et al., 2018). The varying NEMT services and requirements across states can be frustrating for patients to navigate. NEMT faces lower enrollment and has been criticized because there is often the requirement to schedule services days in advance, and there can be long transportation wait times (Chaiyachati et al., 2018).

KFF Medicaid Benefits: Non-Emergency Medical Transportation Services | KFF
 Timeframe: 2018

Location	Benefit Covered	Coverage Code	Copayment Required?	Limits on Services	Prior Approval Required	Reimbursement Methodology
United States	Yes - 46 No - 0 NR - 5	2018 data limited to CN	Yes - 5	Yes - 22	Included in "Limits on Services" for 2018	Not included in 2018 survey

Table 2. Non-Emergency Medical Transportation Services

3.2 Rideshare Voucher Programs

There have been multiple trials of practices utilizing rideshare apps such as Uber and Lyft to assist patients with transportation barriers. Using rideshare-based programs can be cost-saving for some health systems, but installing a program like this may come with extra barriers. Rideshare apps rely on drivers within the geographical area to be active; If there are no drivers in the area, you will be unable to book a ride. This is specifically concerning for rural areas, where there are fewer people registered as drivers on the app. There are also accessibility concerns with rideshare programs, as most vehicles cannot accommodate a wheelchair. Uber and Lyft both offer wheelchair-accessible vehicle programs, but they are only available in a limited number of cities and are only available if a wheelchair-accessible vehicle driver is using the app at that time (Lyft, n.d.; Uber, n.d.). As rideshare programs are usually app-based, people without smartphones or people unfamiliar with using an app may face difficulties accessing the program.

Keck Medicine of the University of South California offered elderly patients three months of unlimited Lyft rides to study the effect of rideshare transportation on the overall health of older adults. This benefit was offered to patients who were 60 years or older, had reported transportation barriers, had a chronic disease, could self-transport in and out of a vehicle, and resided in Los Angeles County or one of the five surrounding counties (Saxon et al., 2019). Participants were either trained on how to use the mobile app if they had a smartphone or provided the number to a call-in service to schedule rides. Nearly one-third of rides were used for medical appointments, and the rest were used for grocery store trips, entertainment, errands, social visits, or fitness classes (Saxon et al., 2019). The majority of subjects reported Lyft was their primary method of transportation to medical appointments during the time period. At the end of the study period, 92% of participants reported an increase in their quality of life (Saxon et al., 2019).

Penn Medicine and researchers at the University of Pennsylvania piloted a rideshare program for Medicaid recipients to determine if it would affect the show rate of patients at two internal medicine practices. Medicare patients have access to the NEMT program, but the study intended to supply a low-barrier program for the population. A research staff member would schedule a patient in the intervention group for a Lyft ride, and the patient would receive a text message describing the make, model, license plate number, and ETA, and receive another text when the vehicle had arrived (Chaiyachati et al., 2018). The control group would receive the practice's standard of a robocall two days before the appointment. At the end of the pilot program, the control group's show rate decreased by 9%, while the intervention group's show rate increased by 14% (Chaiyachati et al., 2018).

In a follow-up study observing the pilot expansion, the results in the control and intervention groups were not statistically different. This study followed the same internal medicine clinic, only increasing the number of patients in both the control and intervention groups (Chaiyachati et al., 2018). Outside forces impacted this study, however; The system overall had a 13% decrease in missed appointments. The location of West Philadelphia may have also impacted the usage rates, as patients had access to the Southeastern Pennsylvania transportation system (Chaiyachati et al., 2018).

3.3 Van Programs

Various health systems nationwide have recognized the need to implement transportation programs for their patients. Taylor Regional Hospital identified this need through a community assessment, as their rural location was prohibitive to taxi, rideshare, and public transportation

services (American Hospital Association, 2018). The van service runs from 7 am to 5:30 pm, and services three neighboring counties. Vans can transport patients to any medical appointment, and the program offers after-hour transportation and prescription deliveries as needed (American Hospital Association, 2018). Patients and providers have expressed thankfulness for the service and the access it has allowed patients.

Private-Public van services exist throughout the country, but these programs often serve high-population centers where the most business potential exists. The ACCESS program in Allegheny County, Pennsylvania is a partnership between for-profit transportation companies and Allegheny County and is funded partially through the Pennsylvania Lottery (ACCESS Transportation Systems, n.d.). The service offers transportation to and from appointments, grocery stores, or other destinations. For all ACCESS programs (except the NEMT program, which they run for Allegheny County), patients have a copayment ranging from \$1.25 to 5.25 each way (ACCESS Transportation Systems, n.d.). This is different than system-funded van programs and rideshare trials, where patients are offered transportation at a low cost. Using a program like ACCESS can be affordable for patients traveling a minimum amount, but for patients who have multiple round-trip appointments a month (as disabled patients often do), this may be cost-prohibitive.

4.0 Recommendations

There are various public and private programs offering transportation services throughout the country. These services are often exclusive (only for ages 65+, only for Medicaid patients, etc), and often involve barriers such as paperwork, high fees, and location restrictions. Locating these programs can also be difficult for patients. Barriers may lead to low usage rates, which makes a project financially infeasible for most systems. However, systems that have implemented easy-to-navigate programs for patients with the highest transportation needs have found positive returns in health, attrition, and financial areas.

Systems struggling with high no-show rates should consider the adoption of system-sponsored transportation programs. Often these programs are a cost benefit for systems, with returns outperforming initial costs. Systems that have adopted these programs see decreases in no-show rates, decreases in attrition, increases in patient satisfaction, and cost savings (Rural Health Information Hub, 2018). Systems concerned with costs associated with transportation programs should consider partnerships with outside sources such as community groups and city/county officials. Taylor Regional Hospital references these partnerships as a key factor for the success of their program (American Hospital Association, 2018).

When implementing programs, systems must consider ease of access. Programs with difficult applications or barriers to use may fail. If planning to use rideshare services, systems must understand and plan for the idea that elderly and disadvantaged populations may not have access to a smartphone, or need assistance in learning how to use an app. Other concerns stemming from offering passes for rideshare services instead of offering a van-based service or bus passes include access issues for patients with physical disabilities, as most rideshare vehicles are not able to

accommodate wheelchairs or other medical devices. Systems must also consider the geographical area in which they operate; Offering transportation assistance in a public transportation-heavy area such as Philadelphia did not have the reduction impact that researchers expected (Chaiyachati et al., 2018).

5.0 Conclusion

Transportation issues are a major barrier to care in the United States. The number of patients who will be affected by these barriers will continue to grow as Baby Boomers enter retirement age. Health systems can address this disparity by implementing in-house transportation programs. These programs can increase appointment show rates, improve patient health, and decrease overall attrition. When considering increasing show rates and decreased emergency department usage, programs may vastly surpass the break-even goal and become profitable.

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