

SOCIAL DETERMINANTS OF HEALTH SERIES



Food



Housing



Education



Transportation



Violence



Social Support



Health Behaviors



Employment

Transportation and the Role of Hospitals



November 2017



Advancing Health in America

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Contact: hretmailbox@aha.org or (312) 422-2600

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Introduction

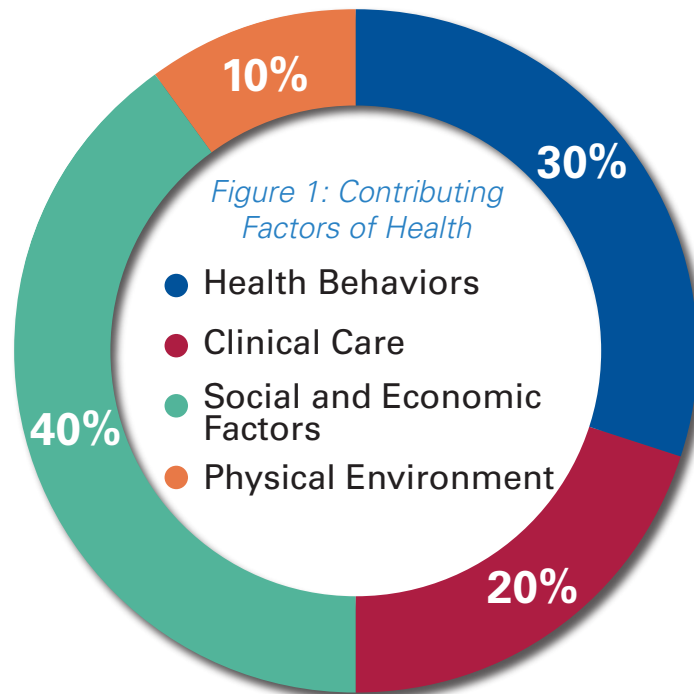
Health and well-being are inextricably linked to the social and economic conditions in which people live. Research has shown that only 20 percent of health can be attributed to medical care, while social and economic factors—like access to healthy food, housing status, educational attainment and access to transportation—account for 40 percent (see Figure 1).¹ Individuals struggling with food insecurity, housing instability, limited access to transportation or other barriers may experience poor health outcomes, increased health care utilization and increased health care costs. Addressing these determinants of health, commonly referred to as social determinants of health, or simply social determinants, will have a significant positive impact on people’s health, including longer life expectancy, healthier behaviors and better overall health.²

Transportation is an economic and social factor that shapes people’s daily lives and thus a social determinant of health.

The World Health Organization defines social determinants of health as “the conditions in which people are born, grow, work, live and age, and the wider set of forces and systems shaping the conditions of daily life.”³

Transportation barriers can affect a person’s access to health care services. These barriers may result in missed or delayed health care appointments, increased health expenditures and overall poorer health outcomes.⁴ Transportation is interrelated with other social determinants of health such as poverty, social isolation, access to education and racial discrimination.

Transportation also can be a vehicle for wellness (see Figure 2). Developing affordable and appropriate transportation options, walkable communities, bike lanes, bike-share programs and other healthy transit options can help boost health.⁵



Source: Health Research & Educational Trust, 2017.

Figure 2. Better Transportation Options Can Lead To Healthier Lives



Source: Better Transportation Options = Healthier Lives Infographic, Robert Wood Johnson Foundation, 2012.⁶

This guide explains the link between transportation and health and discusses the role of hospitals and health systems in addressing transportation issues, improving access and helping design and support better transportation options. Although hospitals and health systems traditionally have not focused on transportation issues within their purview of care delivery, there is a growing recognition that improving transportation access and support for patients can help improve health outcomes and lower health costs. See “Making the Business Case” on page 12.

Based on a literature review, subject matter expert reviews and interviews with four hospitals, this guide outlines strategic approaches that hospitals can use to build a healthier community that addresses the physical, behavioral and socio-economic needs of individuals and families and improves population health. In doing so, hospitals and health systems will better position themselves to achieve the Triple Aim of improved health, improved care and lower costs.⁷

Strategies for hospitals and health systems to address patients’ transportation issues include:

- » Understanding and assessing how transportation can affect overall community health
- » Integrating support for transportation access into the organization’s mission and practices
- » Screening and evaluating patients’ transportation needs
- » Providing direct transportation services through community partnerships or programs
- » Supporting policy and infrastructure programs that create safer and more accessible transportation options

Four case examples in this guide highlight hospitals and health systems that are successfully addressing transportation issues in their communities:

- » **CalvertHealth Medical Center** has a Mobile Health Center that provides primary and preventive care services to residents with transportation challenges.
- » **Denver Health Medical Center** is partnering with Lyft to provide vulnerable patients with transportation services to and from the hospital.

- » **Grace Cottage Family Health & Hospital** collaborates with Green Mountain RSVP in a volunteer driver program, which helps patients attend their medical appointments and also builds community.
- » **Taylor Regional Hospital** operates a hospitality van service for patients in Taylor County and three neighboring counties.

This guide is part of a series of resources from the Health Research & Educational Trust (HRET) on how hospitals and health systems can address the social determinants of health to improve the environment where people live, work and play. The American Hospital Association (AHA), HRET, and the Association for Community Health Improvement (ACHI) are committed to supporting community health and advancing health in America through innovative campaigns, initiatives, partnerships, publications and awards. To view all of the resources in the social determinants of health series, visit www.hret.org/sdoh.

Transportation and Health

Transportation connects people from their origin to their destination, affects land use and shapes our daily lives. Transportation is necessary to access goods, services and activities such as emergency services, health care, adequate food and clothing, education, employment, and social activities.⁸ Because transportation touches many aspects of a person’s life, adequate and reliable transportation services are fundamental to healthy communities.

Barriers to transportation greatly affect the quality of people’s lives. These statistics highlight the scope of the problem:

- » 3.6 million people in the U.S. do not obtain medical care due to transportation barriers.⁹

- » Regardless of insurance status, 4 percent of children (approximately 3 million) in the U.S. miss a health care appointment each year due to unavailable transportation; this includes 9 percent of children in families with incomes of less than \$50 000.¹⁰
- » Transportation is the third most commonly cited barrier to accessing health services for older adults.¹¹

Transportation challenges affect urban and rural communities. Overall, individuals who are older, less educated, female, minority, or low income—or have a combination of these characteristics—are affected more by transportation barriers.¹² Children, older adults and veterans are especially vulnerable to transportation barriers due to social isolation, comorbidities, and greater need for frequent clinician visits.¹³

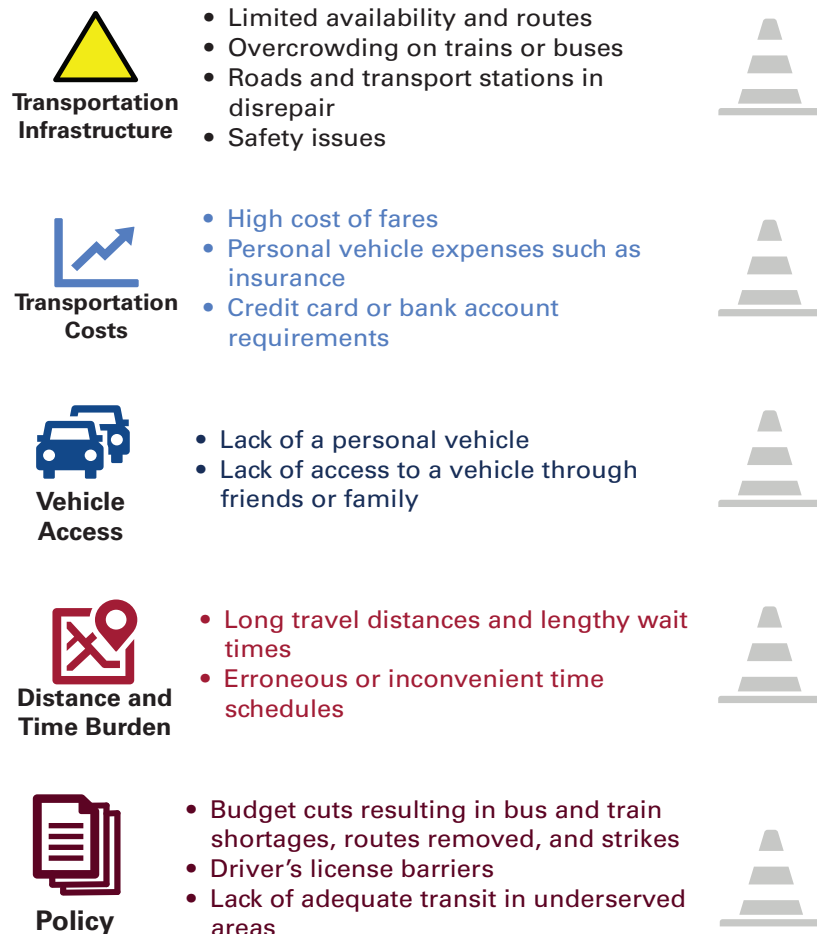
Transportation issues affect people at varying levels depending on how different challenges overlap. For example, a low-income person struggling with travel may have an increased burden if he or she experiences a temporary physical disability. Limited health literacy, cognitive impairment, fragmentation of health history, access to health insurance, poverty or food insecurity can intersect at any period of time and affect individuals and communities.

Transportation Issues

Transportation issues include lack of vehicle access, long distances and lengthy travel times to reach needed services, transportation costs, inadequate infrastructure and adverse policies that affect travel. Figure 3 outlines types of transportation issues and the impact on health care access. Like other social determinants of health, transportation barriers are interconnected so the presence of one may exacerbate or create other barriers.

Figure 3. Transportation Issues and the Impact on Health Care Access

Transportation Barriers to Health Care Access



Impact on Health Care Access and Health

- Missed doctor and clinic appointments
- Limited pharmacy access and decreased prescription fills
- Economic burden for patients and the health care system

Source: Health Research & Educational Trust, 2017.

Vehicle Access

Studies show that people who have access to a vehicle or to friends and family with a vehicle are more likely to use health care services than those without vehicle access.¹⁴ Modes of transportation affect health care access too. People with reliable access to private transportation are more likely to go to a medical appointment than those who rely on public transportation.¹⁵

Place, Distance and Time

Perceived distance and time burdens are frequently cited by patients as a barrier to health care utilization.¹⁶

In urban environments, buses typically provide a crucial link to main rail systems. However, those living in less central neighborhoods must rely on bus services that are limited. These urban residents are more vulnerable to encountering old bus fleets, breakdowns and other related public transit issues.¹⁷

Rural environments have different transit options, costs and availability, but residents still may experience transportation challenges.¹⁸ Residents may be widely spread out in rural areas so trips can take a long time. Rural roads that are curvy or hilly can be challenging to develop and maintain, which could complicate transportation logistics.¹⁹

Overall, studies have found that lack of reliable transportation affects economic mobility, health utilization and more.²⁰



Telehealth options and taking services to patients to reduce travel burden are ways to address place, distance and time challenges. CalvertHealth's Mobile Health Center visits community centers and churches to provide primary and preventive care services, which helps alleviate some of the travel burden for patients.

Studies show an association between poorer health outcomes and how far a patient lives from health care facilities they need to access. This association is evident at all levels of geography—local, urban and rural.²¹

Transportation Affordability

For vulnerable populations, transportation can be unaffordable. Vehicle ownership, cost of insurance, fees, and train and bus fares can be expensive. Individuals vulnerable to transportation barriers are more likely to have low incomes and high expenses associated with comorbidities.²² Data from the Bureau for Labor Statistics show that people earning between \$5,000 and \$30,000 per year spend 24 percent of their income on transportation.²³

Alternative transportation options such as bike-sharing programs require a bank or credit card account, thus excluding unbanked individuals.²⁴



Using care coordinators or community health workers to help patients

identify travel assistance programs through Medicaid or community programs can help reduce transportation costs.

Policy and Infrastructure

Government policies can exacerbate transportation problems with budget cuts, roadway design, transit policies, requirements for driver's licenses and more. Consequences can be increased fares, limited transit availability, labor strikes,²⁵ and lack of transit or bike-share options in low-income communities.²⁶ Driver's license laws such as suspensions for failure to pay fines also impede an individual's ability to travel and obtain necessary services and employment and thus increases the burden.²⁷

Poor transportation infrastructure is related to inequity.²⁸ Freeways in disrepair, inadequate railways and roads, limited transit availability and routes, or unsafe public transportation all can contribute to barriers to health care utilization, employment, child care, fresh and healthy groceries, and other life necessities.²⁹ Generally, communities that are walkable, bike-friendly and transit-oriented are associated with healthier outcomes.³⁰



Hospitals can address transportation policy and infrastructure issues in many ways. For example, identify areas where transportation needs are most pronounced. Participate in local or regional transportation planning initiatives and help planners focus on these vulnerable areas and allocate resources to address infrastructure. See Figure 4 for more strategies.

The Role of Hospitals

To address transportation issues and help create better transportation options for patients, hospitals can implement multiple strategies to increase patients' access to health care and other services.

There is a strong business case for hospitals and health systems to address transportation needs since individuals experiencing these issues are more likely to miss appointments or not fill prescriptions, leading to delays in care and potentially to disease progression and complications or readmissions. (See "Making the Business Case" on page 12.) Improving transportation also improves:




- » health outcomes,
- » quality of life and
- » cost savings for patients and health systems.


Due to their reach and influence, hospitals and health systems are well positioned to make a positive impact on the health outcomes of the communities they serve by addressing transportation issues.

Since transportation affects people in different ways, strategies addressing these issues need to be varied yet targeted. Multiple strategies need to be employed to maximize reduction in transportation gaps. Figure 4 describes effective strategies to address transportation issues. Many of these strategies are used by hospitals and health systems highlighted in the case studies in this guide.

Figure 4. Strategies for Hospitals to Address Transportation Issues

Strategy	Description	Examples
Understand and assess how transportation can affect overall community health	There are different indicators to assess how the transportation environment affects health in communities. Use data to understand the health impact of transportation.	<ul style="list-style-type: none"> » Use the CDC Transportation Health Impact Assessment Toolkit; the toolkit is geared toward community planners and health professionals to engage with all stakeholders and account for future transportation initiatives that have health impacts.³¹ » Review data from the Transportation and Health Tool to understand the health impact of an existing transportation system or proposed transportation project.³²
Integrate access to transportation with organization’s mission and practices	A strong organizational commitment will help provide solutions to transportation barriers.	<ul style="list-style-type: none"> » Make a financial and personnel commitment to building, executing and growing transportation services externally (patients) and internally (employees); Seattle Children’s Hospital offers employees free transit passes, shuttle links to transit hubs, free bikes and onsite bike-sharing.
Expand partnerships to support addressing transportation issues	Partnerships with government agencies, health and social service providers, elected officials, transportation authorities, private transportation providers, volunteers and educational institutions can create new opportunities to address transportation issues.	<ul style="list-style-type: none"> » Participate in local or regional transportation planning initiatives and educate decision-makers about how health can be affected by transportation.
Support policy and infrastructure programs aimed to improve transportation access and address other social determinants of health	Many of these programs are multinational and focus on improving transportation access and increasing safe, healthy and equitable mobility for all.	<ul style="list-style-type: none"> » Become involved with programs and policies such as Vision Zero, Complete Streets, livable community initiatives, and smart growth approaches. » Invest in transit systems to improve health; MetroHealth System sponsored a bus rapid transit route and the return on investment has been significant.

Strategy	Description	Examples
Invest resources in understanding patients' transportation needs	Transportation barriers and gaps may differ from patient to patient so there is not a one-size-fits-all solution.	<ul style="list-style-type: none"> » Use methods such as a health impact assessment, SWOT analysis or environmental scans; with such knowledge, hospitals and health systems are in a better position to measure transportation impacts and develop solutions.
Use a screening tool to help identify patients with transportation needs	Patients may be hesitant or may not mention transportation issues. They may be unaware that transportation is a need to discuss during an appointment.	<ul style="list-style-type: none"> » Screen by using tools or checklists such as the Social Needs Screening Toolkit from Health Leads to identify patients' transportation needs and other social determinants of health.
Provide direct transportation services through community partnerships or programs	When transportation is unavailable, health care systems may need to provide transportation directly to patients and staff.	<ul style="list-style-type: none"> » Establish volunteer-driver programs. <ul style="list-style-type: none">  See the Grace Cottage Family Health & Hospital case example. » Partner with ride-sharing companies like Uber or Lyft. <ul style="list-style-type: none">  See the Denver Health Medical Center case example. » Operate door-to-door shuttle services. <ul style="list-style-type: none">  See Taylor Regional Hospital case example.
Educate staff about transportation issues	Knowledgeable staff who build trust and offer services in a respectful, culturally competent manner are key to successfully addressing patients' transportation issues. ³³	<ul style="list-style-type: none"> » Use care coordinators, community health workers or other staff to help patients identify and apply for transportation assistance through patient insurance. » Provide cultural sensitivity training for drivers and staff.
Promote transportation options and increase awareness through outreach	Partnerships with community-based organizations promote interest in shared mobility systems. Many patients who are eligible do not enroll or are not aware of the program's transportation benefits.	<ul style="list-style-type: none"> » Provide assistance in multiple languages and in promotional materials that speak to the concerns of target communities. » Increase efforts in Medicaid nonemergency medical transportation benefit enrollment and focus on outreach, informing eligible patients of transportation services.³⁴ » Provide travel vouchers or transit passes for patients.

Strategy	Description	Examples
Support or invest in programming or infrastructure to reduce travel for patients	Some areas have extremely limited travel options. It may be beneficial to bring programming or services to patients instead of patients traveling to providers and other services.	<ul style="list-style-type: none"> » Create prescription mail service. » Provide telehealth options. » Offer pharmacy and other services onsite to reduce travel. » Establish mobile health clinics.  See CalvertHealth Medical Center case example. » Operate door-to-door shuttle services.

Source: Health Research & Educational Trust, 2017.

Impact on Health Care Access and Health

Connection to Other Determinants of Health

Transportation and other social determinants of health are interrelated and play a major role in a person's health and well-being. For example, lack of transportation to grocery stores is one of many causes of food insecurity.³⁵ Physical environmental attributes such as limited transportation options or food deserts can contribute to limited consumption of fresh, healthy foods.³⁶ Transportation to and from work, school, recreation and other activities can have an impact on an individual's social support, education, employment, housing and health behaviors. Overall, transportation barriers, along with other social determinants of health, are a population health issue. The impact of transportation can be measured in multiple ways such as the cost of missed appointments, decreased pharmacy access and prescription fills, and economic barriers.

Making the Business Case

Missed appointments

Patients frequently identify transportation barriers as a major reason for missing health care appointments.³⁷ Missed appointments are associated with increased medical care costs for the patient, disruption of patient care and provider-patient relationships, delayed care and increased emergency department visits.³⁸ Missed appointments and the resulting delays in care cost the health system \$150 billion each year in the U.S.³⁹ When a patient is unable to find or afford a ride, costs accrue for patients, caregivers, providers, insurers and taxpayers. Health care systems lose revenue from missed appointments because of the effects on delivery, cost of care and resource planning.⁴⁰

Decreased pharmacy access and prescriptions fills

Patients are less likely to fill prescriptions if they experience transportation issues. According to one study, 65 percent of patients said transportation assistance would help with prescriptions fills after discharge. Studies have shown that restriction of Medicaid payments for transportation resulted in decreased prescription refills.⁴¹

Economic barriers

Transportation is linked to economic mobility. Approximately 80 percent of workers drive or ride in a car to work.⁴² Research has shown that disruption or barriers to transportation negatively affects productivity and employment and causes health inequities.⁴³ Multimodal transportation systems offering a combination of affordable, high-quality vehicular, public or alternative transportation options support community economic development, health care utilization and promote healthy behaviors such as exercise.⁴⁴

Conclusion

Barriers to transportation and lack of transportation options can interfere with people enjoying a healthier, higher quality of life. People depend on safe and easy transportation to travel to health care services as well as places of employment, childcare, places of worship, parks and recreation, social gatherings and more.

Hospitals and health systems are recognizing that social, economic and environmental factors affect the opportunities that patients and their families have to engage in healthy behaviors, which ultimately improves health outcomes. Additionally, addressing social determinants of health, like transportation, is important for achieving greater health equity.

Hospitals and health systems can address patients' transportation needs and improve the health of their communities by implementing a variety of strategies, including:

- » Understanding and assessing the impact of transportation on public health
- » Supporting policy and infrastructure programs aimed to improve transportation access and to create safer, healthier transportation options
- » Investing resources in understanding patients' transportation needs
- » Providing mobile clinics or direct transportation services through community partnerships or programs
- » Using technology, such as providing telehealth options, to reduce travel time for patients

By making the commitment to address transportation barriers and building partnerships with community organizations and other entities, hospitals and health systems can improve transportation and health care access for patients and families and create more equitable, healthier communities.

Case Studies

CalvertHealth Medical Center

Introduction

Located in southern Maryland, CalvertHealth Medical Center is the only hospital in Calvert County. More than 77 percent of Calvert County’s 90,000 residents visit the hospital for health care services. In addition to the main campus in Prince Frederick, the health system has four satellite medical centers, located in Dunkirk, Lusby, Solomons and Twin Beaches.

Calvert County is a rural county with only one highway, so people who live away from the highways or town centers have difficulty accessing essential services.

CalvertHealth’s 2014 community health needs assessment (CHNA), developed in partnership with Conduent Healthy Communities Institute (HCI) Corporation, identified access to health care services as one of the community’s top three priority health needs. Lack of transportation was identified as one of the most significant socio-economic barriers to health in the county. About 4 percent of households in Calvert County do not own a car, making it difficult, particularly for low-income households, to travel to hospitals, doctor’s offices and grocery stores.



At a Glance

System Name
CalvertHealth

Featured Hospital Name:
CalvertHealth Medical Center

System Stats
5 locations, including more than 20 medical offices

Hospital Type
Nonprofit, private, independent

Location
Prince Frederick, Maryland

Beds
126

health care access and delivery in Calvert County, CalvertHealth Medical Center has introduced several initiatives.

Mobile Health Center. CalvertHealth’s CHNA and Conduent HCI’s integrated data platform, with real-time community health data, facilitated the development of many programs that address barriers to health care. Using HCI’s SocioNeeds Index and access to care maps, CalvertHealth identified regions and populations in Calvert County experiencing difficulty accessing care. Since 2016, the Mobile Health Center, managed by the hospital’s community wellness department, delivers care to residents who cannot visit hospitals or doctor offices regularly for primary and preventive care services. With support from the CalvertHealth Foundation, donations from local businesses and organizations, and proceeds from two fundraising events, more than \$300,000 was raised to buy the Mobile Health Center.

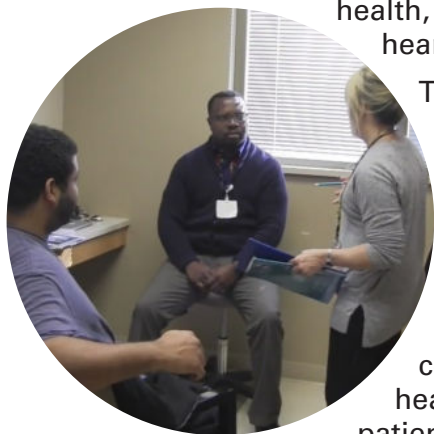
Essentially a 40 foot “state-of-the-art” truck, the Mobile Health Center has two fully equipped exam rooms—one for medical/dental services and one transitional room—a waiting area, classroom space and a wheelchair lift. The hospital has created a [video tour of the Mobile Health Center](#).

Limited access to health care services due to transportation barriers and lack of health insurance is overwhelming in North Beach/Chesapeake Beach, Prince Frederick and Lusby. The Mobile Health Center schedules regular visits to community centers and local churches in these three areas. In

Interventions

To address transportation barriers and improve

addition to providing primary care services and dental care, the Mobile Health Center offers screening for diabetes, cholesterol and high blood pressure. On selected dates and locations, the mobile unit also screens for lung cancer, skin cancer, breast health, bone density and hearing and vision.



The Mobile Health Center serves as an engagement and care center where a certified registered nurse practitioner is there to discuss medical concerns, identify health risks and help patients navigate to

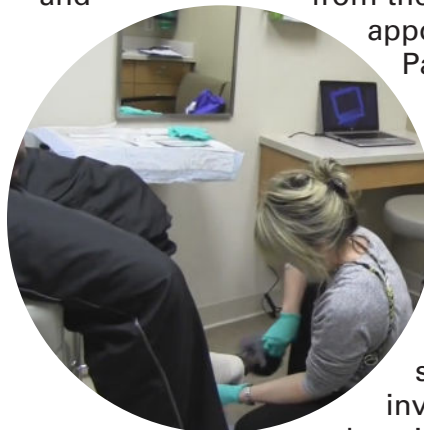
the appropriate level of care within the health system and find local health resources within their geographic area. With this initiative, CalvertHealth is working to provide education, support and outreach to community members and promote wellness.

CalvertHealth CARES. Since 2013, CalvertHealth has been a member of Partners in Accountable Care Collaboration and Transitions (PACCT), a community coalition of health care providers and about 30 local agencies. The coalition is committed to sharing and developing best practices and solutions to improve patient outcomes and experience. CalvertHealth CARES (Collaborative Activation of Resources and Empowerment Services), an initiative of PACCT launched in 2015, is a free, comprehensive community benefit program to meet the needs of patients after discharge and reduce readmission rates and emergency department usage. Patients are offered health services based on medical need. CalvertHealth CARES includes several initiatives, including the Medication and Transportation Assistance Program (MAP/TAP) and the CalvertHealth CARES Clinic.

The Transportation Assistance Program

(TAP) was developed after PACCT and other community organizations reported the transportation challenges of community members. Hospital patients and employees verbally reported significant transportation barriers in the community, such as inaccessible locations of bus stops, limited taxi services, and lack of sidewalks and walk bridges. In addition, the number of no-shows to physician appointments was an issue. To address the transportation challenges encountered by patients and employees, TAP was integrated into the CalvertHealth CARES program. The hospital budgets \$2,000 annually for this program.

CalvertHealth CARES has conducted patient interviews to determine the underlying reasons for missed appointments and then identify the services needed the most. If patients specifically report they miss their medical appointment due to inaccessible transportation, they are referred to TAP. TAP uses a quantitative screening tool to assess the needs of patients with transportation barriers. A social worker conducts the screening and scores the assessment to identify patients who are greatly affected by transportation due to poor health, lack of finances, unemployment, homelessness or other reasons. TAP partners with a local taxi service to provide patients with a taxi voucher. The taxi service transports patients from Calvert County and some patients outside the county to and



from their medical appointments. Patients are required to make their own cab arrangements and asked to tip their driver. The taxi company sends an invoice to the hospital for payment.

Additionally, as part of the CalvertHealth CARES Clinic, a pharmacist visits patients who are experiencing difficulties picking up prescriptions, attending doctor’s appointments or understanding their medication and care plan. The pharmacist delivers medications to patients and educates them about their medication to build health literacy.

Collaboration with STAAR Alert. As part of a grant funded by the Health Services Cost Review Commission, Totally Linking Care—a coalition that includes CalvertHealth, seven other hospitals and several community organizations—is partnering with STAAR Alert, a medical alert system that offers personalized in-home care services to patients. This partnership is a new approach to delivering health care to patients with limited access due to poor medical conditions, aging or lack of transportation. This service provides medical management devices, electronic pill boxes, electronic scale, blood pressure cuffs and glucometers in patient’s homes. Patient reports can be downloaded by the hospital and transmitted to the patient’s primary care doctor or to the collaborative.

Impact

In the first six weeks of its launch, the Mobile Health Center provided services to 330 residents at local schools, health fairs, churches and community events. The mobile unit also provides dental screening at a community center that serves local elementary schools, and individuals who need additional treatment are connected to CalvertHealth’s dental clinic.

The CalvertHealth CARES’s TAP program covered taxi transportation for 16 patients between January and June 2015, with an average expenditure of \$62. Between March 2015 and January 2017, CalvertHealth CARES received 1,721 referrals for its CalvertHealth CARES clinic and MAP/TAP program. Overall, the hospital has seen a nearly 9 percent reduction in readmission rates since the start of CalvertHealth CARES. With the

launch of the CalvertHealth partnership with STAAR Alert in November 2017, the hospital hopes to decrease the number of patients who cannot visit physician offices because of transportation issues.

Lessons Learned

- » Bridging gaps in health care is a need.
- » Investing in patients is the key to understanding how to care for them.

Next Steps

The Mobile Health Center is organizing visits to the local Head Start and Judy Center programs as well as expanding services to senior centers and partnering with faith-based organizations to address identified health disparities. The center is also exploring partnering with schools and local youth organizations to offer health assessments and physicals for sports participation. The CalvertHealth community wellness department is developing a program to address the health needs of the Spanish-speaking population in the county.

The CalvertHealth CARES program will continue to focus on enhancing current services, including seamless implementation of the STARR Alert system.

Contact

Karen L. Twigg
Director, Care Coordination and Integration
CalvertHealth Medical Center
(410) 535-8217
karen.twigg@calverthealthmed.org

Margaret Fowler
Director of Community
Wellness
CalvertHealth
Medical Center
(410) 414-4573
margaret.fowler@calverthealthmed.org



Denver Health Medical Center

Introduction

Denver Health, a large safety net hospital, provides health care for approximately 150,000 individuals in Denver, the state of Colorado and the Rocky Mountain region. The health care system focuses on improving clinical care and enhancing knowledge and practices through education and research. Denver Health's main campus includes a Level I trauma center and has wards to accommodate care for correctional inmates. Besides 10 community health centers and 17 school-based clinics, the hospital also runs a center for eating disorders, poison and drugs and offers detoxification services through Denver CARES.

Hospital leaders noticed that even though many patients seek several types of treatment at the hospital and its affiliated clinics, the no-show rate for outpatient visits was significant. Additionally, patients who had been admitted to the hospital were waiting an extended amount of time after discharge to travel home. After surveying patients, the hospital identified lack of transportation as a primary reason that patients were missing their appointments and waiting so long after discharge to go home.

Denver Health's mission emphasizes the importance of a patient's health and satisfaction. Limited access to routine health care due to transportation issues may make patients wait until they are in a health crisis to seek care in the emergency department. This is not the best option for patients nor the best way for hospitals to provide care. If transportation barriers are preventing patients from receiving the health care they need or preventing them from returning

home in a timely fashion, patients are likely to be less satisfied with their care.

To help patients with transportation issues, Denver Health offers free bus tickets, cab vouchers, and a private car service through a vehicle donated by Oprah Winfrey. The "Oprah" car is staffed by retired community residents who are

interested in helping get patients to and from appointments. More recently, the hospital started a collaboration with Lyft, the on-demand transportation company.

Intervention

In November 2016, Lyft and Denver Health collaborated to develop a platform allowing the hospital to order rides for patients in need of transportation

services. The service is offered to recently discharged patients and to patients who need transportation to and from outpatient clinical appointments. When the service was launched, it was piloted with patients in the emergency department. After three months, the service was expanded to hospital inpatients. Recently, it has been extended to four outpatient clinics as well.

The initiative is still expanding based on the community's needs and suggestions for improving practices. For example, nurses were initially calling and making appointments with Lyft, but by the time a patient was discharged, the Lyft driver had already come and gone. Since this service is extremely fast and trackable, the hospital staff is now responsible

At a Glance

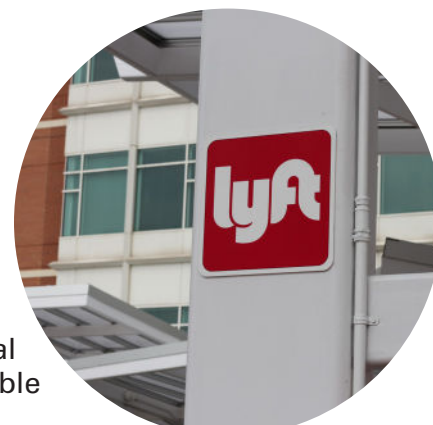
System Name
Denver Health Medical Center

System Stats
10 neighborhood family health centers, 17 in-school clinics

Hospital Type
Urban, safety net

Location
Denver, Colorado

Beds
525



for requesting and tracking a Lyft ride once the patient’s discharge is complete. Patient navigators and social workers raise awareness among Denver Health patients and the larger Denver community by advertising and coordinating rides to and from medical appointments. Funded by the Denver Health Foundation, this service can cost an average of \$7.40 per ride and is limited to 25 miles.

Impact

In the first three months of this collaboration, Denver Health ordered more than 200 rides from Lyft for patients visiting the hospital and its clinics. Denver Health uses the patient advocate office to track the number of complaints about lack of adequate transportation. Prior to the Lyft partnership, patient advocates received complaints daily. Since the partnership was launched, there have been zero complaints recorded about lack of transportation. The hospital also tracks the number of rides per location, to determine where the greatest community needs are located.

Denver Health has found that the Lyft program is a great benefit to patients for whom English is a second language. Navigating public transportation for these patients can be especially challenging, and getting a ride from the clinic to their homes removes that stress.

Lessons Learned

- » When collaborating with on-demand transportation services, it is imperative to understand how the system works. Because this service is fast and has an average wait time of two to three minutes, the hospital must delegate certain staff members to order the service, to avoid longer wait times and ensure patients are connected with their ride home.

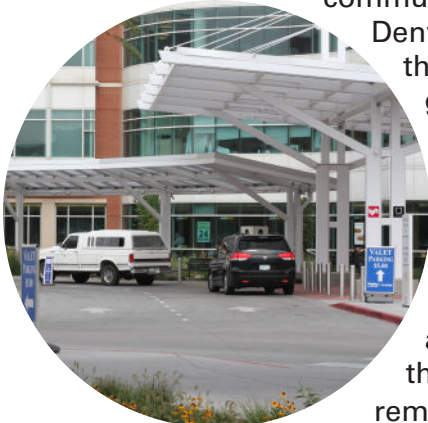
- » Identify the area in the community where people would benefit the most from the service. Knowing that people genuinely need the Lyft service is essential in maintaining and eventually increasing the number of patients attending medical appointments and reporting better health outcomes due to improved access to care.
- » Have the infrastructure in place to coordinate patient and driver interaction. Though initially it was challenging for the Lyft drivers to connect with patients, the hospital established a process to ensure the drivers are connected with the right patients. Making sure that the patient identifies the driver using a picture and car description and instructing the drivers to verify the patient’s name and address when they enter the car has helped to ensure the process works as planned.
- » Recognize there is always room of improvement.

Next Steps

The hospital’s goal is to investigate the feasibility of a self-driving shuttle to use in designated spots around the community. Denver Health believes this service would increase access to care for various patient populations and also increase patient satisfaction and positive health outcomes and reduce pollution. The hospital is researching opportunities to use telehealth to improve care delivery without patients having to visit the hospital regularly for minor health issues. Denver Health also plans to assist communities with refugees by providing educational materials to help them better understand and use the hospital’s transportation services.

Contact

Amy Friedman
Chief Experience Officer
Denver Health and Hospital Authority
(303) 602-2925
amy.friedman@dhha.org



Grace Cottage Family Health & Hospital

Introduction

Since 1949, Grace Cottage Family Health & Hospital has become a primary source of health care for people in Townshend, Vermont. It provides acute, chronic, palliative, emergency and inpatient end-of-life care and also offers an inpatient rehabilitation program. The hospital operates Messenger Valley Pharmacy, the only retail pharmacy in Townshend. These services are available to approximately 7,700 residents from 20 surrounding towns. This rural critical access hospital has 10 primary care doctors, a podiatrist, a pediatrician, a psychiatric nurse practitioner and a urologist.

In Windham County, Vermont, Grace Cottage Hospital's 2015 community health needs assessment identified lack of transportation as one of the most significant barriers for residents to access adequate health care. The hospital also conducted one-on-one interviews to identify individual needs. Though there is a countywide bus and car service to

provide transportation ("The Current"), it is available only for residents that meet certain requirements. This service only accepts riders who are 60 years of age or older or who qualify for Medicaid, and a rider must request a ride with two business days' advance notice. This type of service does not work well for those with urgent needs.

Recognizing that many patients were unable to access care due to some type of transportation barrier, the hospital's community health team initiated the volunteer driver program in 2016. This program's only requirement is that a rider must be physically or cognitively independent, or travel with an assistant. Rides are provided to and from Grace Cottage for residents of Athens, Brookline, Jamaica, Newfane, Townshend, Winhall and other towns along the Routes 30 and 35 parameters. Potential riders are referred first to The Current, if they qualify. If not, rides are arranged with the volunteer drivers.

Intervention

Grace Cottage collaborated with Green Mountain RSVP, a nonprofit, nationwide program of volunteers age 55 and older, to start the volunteer driver program at the hospital. This collaboration recruits volunteer drivers from West River Valley and other neighboring towns. To improve access to wellness services and medical appointments,

Grace Cottage utilized RSVP's insurance rider program to station volunteer drivers at the hospital. Volunteer drivers use their personal cars to assist those struggling to attend medical appointments at Grace Cottage's primary care practices or to return home after outpatient appointments or inpatient stays. The program's services are available to all patients.

The Grace Cottage transportation program fulfills requests for rides even if made less than 48 hours before scheduled appointments, which the countywide bus and car service does not, thus addressing a gap for patients who need urgent rides to

At a Glance

Hospital Name
Grace Cottage Family Health & Hospital

Hospital Stats
Family health clinic, pharmacy, diagnostic laboratory

Hospital Type
Rural, nonprofit, community, critical access

Location
Townshend, Vermont

Beds
19



specialists and local tertiary care facilities. The hospital's community health team coordinates the program and its drivers. The program started with one driver, and almost a year later, it has increased to six drivers. Grace Cottage Hospital and RSVP both contribute to the program. RSVP vets all drivers by completing insurance and background checks, and it provides insurance to cover the drivers in case of an accident. The hospital provides a free lunch to drivers each time they give a ride to a patient and also includes drivers in volunteer recognitions.



Though buy-in from risk management was initially challenging to obtain, presenting this to leadership as an innovative practice that could address issues of access to care helped them see the financial and health outcome benefits of the program, without any insurance liability.

Impact

This program has made a major difference in the community. It has created new resources through collaboration and also increased community support. RSVP volunteers are older adults who are searching for ways to actively spend time and energy helping the community and its residents. Through the driver program, these volunteers are able to interact and build relationships with community members and hospital staff. Each driver gave an average of four to six rides a month in the first six months of the program, and now the average has increased to eight to 12 rides a month. The program has not had a formal evaluation matrix, but none of the drivers have missed any of their assigned appointments since the program started.

William Monahan, the community health team outreach coordinator who developed the program, has built a positive

relationship with the drivers and with patients seeking the service. Monahan says, "After hearing about the program, patients have called me desperately asking for help because they have no means of attending their medical appointments." Monahan makes it a point to visit these patients in the hospital or clinic, to assure them that the hospital is working to address community needs. "Patients have hugged and thanked me for this program. Without the program, many would not have been able to get treatment when it's most needed. Seeing patients smile and appreciate the service is more than what we could have hoped for," Monahan says.

Lessons Learned

- » Collaboration is key to developing resources that move health forward.
- » Collaboration is also key to enhancing community growth.

Next Steps

The leadership and staff at Grace Cottage Family Health & Hospital recognize that transportation barriers restrict patients from accessing timely care and also prevent them from accessing food. The hospital plans on collaborating with a local food pantry, Veggie VanGo, expanding its program to transport healthy foods to patients and families in need. Volunteer drivers would deliver food from the pantry to vulnerable community members who are unable to visit the food pantry's weekly food drop.

Currently, all volunteer drivers provide rides to patients "out of the kindness of their hearts." The hospital has recently applied for a grant that would provide funds for gas cards for the drivers.

Starting with fiscal year 2018, data on the number of rides provided and the

types of appointments achieved will be recoded for use in future reports.

Contact

William Monahan, R.N.
Outreach Coordinator
Community Health Team
Grace Cottage Family Health & Hospital
(802) 365-3762
wmonahan@gracecottage.org

Taylor Regional Hospital

Introduction

Serving approximately 110,000 people in the rural community of Campbellsville, Kentucky, and surrounding regions, Taylor Regional Hospital is an acute care facility with a Level III trauma center, and other care centers. With 94 physicians specializing in more than 25 specialties, the hospital served more than 98,000 patients in 2016. The hospital also has a correctional medical program to serve patients in area prisons.

Taylor Regional Hospital identified transportation as a major barrier to health care delivery, through its community health needs assessment. Besides doing a community health needs assessment every three years to determine services that are inaccessible in the community, the hospital also solicits input from public leaders and community organizations. The cancer center at the hospital screens patients to identify those with transportation issues. Patients are also referred by their providers for transportation services.

Any type of transportation services are located an hour away from Campbellsville, which restricts community residents from receiving timely care. Without taxis or public transportation in the area, residents of Taylor, Green, Marion and Adair counties are supported by a



hospitality van service. This service, provided by the hospital and sponsored by 14 entities, including local businesses and community organizations, has opened many opportunities for residents to seek transportation when needed.

Intervention

Taylor Regional Hospital discerned the need for transportation services after evaluating the number of patients coming in for follow-ups, cancer screenings, lab testing, and other appointments. With transportation services available only in areas an hour away from Campbellsville, the hospital's cancer committee noticed that more people were missing their routine check-ups and radiation treatments. Though Medicaid patients have access to transportation services, many uninsured patients and some patients with Medicare and private insurance in Taylor County had no means of getting to and from the hospital or its clinics. Hospital leadership recognized that lack of transportation

interrupts care delivery, therefore it initiated a hospitality van service for patients facing transportation issues.

The hospitality van service consists of two vans, running every day of the week from 7:00 a.m. to 5:30 p.m. The vans pick up and drop off patients at the hospital, dialysis centers, cancer centers, rehab centers and other facilities. As part of its commitment to engage the community in this program, the hospital dispatches the hospitality van service to three neighboring counties, increasing transportation access for various communities and age groups. Though the vans are owned by

At a Glance

Hospital Name
Taylor Regional Hospital

Hospital Stats
10 physician offices,
rehab center, cancer
center, dialysis center

Hospital Type
Rural, nonprofit, community,
medical, surgical

Location
Campbellsville, Kentucky

Beds
90

the hospital, pickup and drop-off do not have to be at hospital-owned facilities. Patients who need transportation can use this service for medical appointments at any center, clinic or facility. Beyond that, the vans also deliver prescriptions to patients and provide transportation outside regular hours for special treatment or appointments, if needed.

The hospital has operated the van service since 2007, and it has been a part of the hospital's annual business and budget plans. Taylor Regional bears the cost of maintaining the vans and employing one full-time driver, one part-time driver and one per diem driver. Fourteen local organizations that sponsor the service are responsible for funding \$80 each per month for gas. To raise money to purchase new vans with fewer miles, the hospital holds an annual fundraiser. With these funds, the hospital buys a new van every two years, which costs about \$35,000 per van.

Taylor Regional Hospital also publicizes the van hospitality services through various channels. Home health agencies in the area and local community organizations, such as the homeless shelter, drug rehab center and health department, all inform patients of the van services that are available. The hospital has built strong partnerships with the 14 sponsoring organizations, and their logos are included on the van. The hospital also advertises their support via social media and the hospital's website.

Through these efforts and with community support, the van service has expanded over the years. The van service transports about 1,100 different patients every year, and many of them have multiple visits. In 2007, the van service traveled 18,481 miles; in 2016, it increased to 104,972 miles.



One patient, Schultz, who lives 15 miles from Campbellsville, needed total knee replacement surgery. Afraid of leaving her husband suffering from dementia alone, Schultz almost avoided having the surgery because she had no way of traveling back and forth for rehab after surgery. The

hospital offered Schultz transportation through the van service. Because of this help, Schultz attended all of her therapy sessions and now volunteers for the hospital's auxiliary department.

Lessons Learned

The hospitality van service has increased access to care for many communities near Taylor Regional Hospital, and support from the community helped make it possible. Investing in the community

Impact

Though the hospital has not conducted a formal survey to evaluate the program and its services, it assesses the impact using feedback from community members who use the service. Jane Wheatley, CEO of Taylor Regional Hospital, says, "With 25,000 people using this service, we've never received a negative comment or complaint about it. Patients themselves and their loved ones have expressed how helpful this service has been in receiving treatment." The hospital continues to promote and raise awareness. Hospital leaders are passionate about creating a positive impact on the well-being of the community and are not focused on a large financial return on investment. "As long as we break even, we know that this service is helping people get the treatment they need whenever they want to," Wheatley says. "There is no dollar amount on the success of this program; patients' satisfaction encourages us to keep going."

and identifying residents' health-related needs are the first steps in the process. To develop a similar transportation service, the hospital recommends:

- » Seek leadership buy-in
- » Pursue support from city and county government officials
- » Collaborate with community organizations and business for additional resources, whether it is for funding, volunteers, utilities or other needs
- » Maintain a budget for maintaining the service every year (e.g., to purchase new tires or brakes)
- » Address challenges as an opportunity to grow
- » Report back to the community about efforts to address priority health issues

Next Steps

With the success of the hospitality van service over the years, Taylor Regional Hospital is discussing branching out to other communities. The hospital is considering purchasing another van and employing a part-time driver to extend services to other nearby communities and continue improving health outcomes.

Contact

Jane Wheatley
Chief Executive
Officer
Taylor Regional
Hospital
(270) 789 -5864
[jwheatley@
trhosp.org](mailto:jwheatley@trhosp.org)



Endnotes

1. University of Wisconsin Population Health Institute. (2016). County Health Rankings & Roadmaps: Our approach. Retrieved from <http://www.countyhealthrankings.org/our-approach>
2. National Prevention Council. (2011, June). *National prevention strategy: America's plan for better health and wellness*. Washington, DC: U.S. Department of Health and Human Services, Office of the Surgeon General. Retrieved from <https://www.surgeongeneral.gov/priorities/prevention/strategy/report.pdf>
3. World Health Organization. (2017). Social determinants of health. Retrieved from http://www.who.int/social_determinants/sdh_definition/en/
4. Syed, S. T., Gerber, B. S. & Sharp, L. K. (2013). Traveling towards disease: Transportation barriers to health care access. *Journal of Community Health*, 38(5): 976–993. Retrieved from <http://doi.org/10.1007/s10900-013-9681-1> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4265215/>
5. Robert Wood Johnson Foundation. (2012, October). *How does transportation impact health?* Princeton, NJ: Author. Retrieved from https://www.rwjf.org/content/dam/farm/reports/issue_briefs/2012/rwjf402311
6. American Public Health Association. (2010). The hidden health costs of transportation. Washington, DC: Author. Retrieved from https://www.apha.org/~media/files/pdf/factsheets/hidden_health_costs_transportation.ashx
7. Bachrach, D., Pfister, H., Wallis, K. & Lipson, M. (2014). *Addressing patients' social needs: An emerging business case for provider investment*. New York, NY: Manatt Health Solutions. Retrieved from <https://pdfs.semanticscholar.org/f564/d23c39841c171b09a258f1a527cb5d7f031a.pdf>
8. Victoria Transport Policy Institute. (2016, August 25). Basic access and basic mobility: Meeting society's most important transportation needs. Retrieved from <http://www.vtpi.org/tdm/tdm103.htm>
9. Wallace, R., Hughes-Cromwick, P., Mull, H., & Khasnabis, S. (2005). Access to health care and nonemergency medical transportation: Two missing links. *Transportation Research Record: Journal of the Transportation Research Board*, (1924): 76-84. Retrieved from <http://trrjournalonline.trb.org/doi/abs/10.3141/1924-10>
10. Grant, R., Gracy, D., Goldsmith, G., Sobelson, M. & Johnson, D. (2014). Transportation barriers to child health care access remain after health reform. *JAMA Pediatrics*, 168(4): 385-386. Retrieved from <http://jamanetwork.com/journals/jamapediatrics/fullarticle/1819645>
11. Fitzpatrick, A. L., Powe, N. R., Cooper, L. S., Ives, D. G. & Robbins, J. A. (2004). Barriers to health care access among the elderly and who perceives them. *American Journal of Public Health*, 94(10): 1788-1794.
12. Syed, S. T., Gerber, B. S., & Sharp, L. K. (2013). Traveling towards disease: Transportation barriers to health care access. *Journal of Community Health*, 38(5): 976-993. Retrieved from <https://link.springer.com/article/10.1007/s10900-013-9681-1>
13. Ibid.
14. Ibid.
15. Ibid.
16. Kelly, C., Hulme, C., Farragher, T. & Clarke, G. (2016). Are differences in travel time or distance to healthcare for adults in global north countries associated with an impact on health outcomes? A systematic review. *BMJ Open*, 6(11): e013059. Retrieved from <http://bmjopen.bmj.com/content/6/11/e013059.long>

17. Ibid.
18. Hansen, A. Y., Meyer, M. R. U., Lenardson, J. D., & Hartley, D. (2015). Built environments and active living in rural and remote areas: A review of the literature. *Current Obesity Reports*, 4(4): 484-493. Retrieved from <https://link.springer.com/article/10.1007/s13679-015-0180-9>.
19. Ibid.
20. Litman, T. (2002). Evaluating transportation equity. *World Transport Policy & Practice*, 8(2), 50-65. Retrieved from <https://pdfs.semanticscholar.org/fa6c/6421f37a60cb8d4bde401ebd384ac174bc40.pdf>
21. Kelly, C., Hulme, C., Farragher, T. & Clarke, G. (2016). Are differences in travel time or distance to healthcare for adults in global north countries associated with an impact on health outcomes? A systematic review. *BMJ Open*, 6(11): e013059. Retrieved from <http://bmjopen.bmj.com/content/6/11/e013059.long>
22. Syed, S. T., Gerber, B. S. & Sharp, L. K. (2013). Traveling towards disease: Transportation barriers to health care access. *Journal of Community Health*, 38(5): 976-993. Retrieved from <https://link.springer.com/article/10.1007/s10900-013-9681-1>
23. Dickersin-Prokopp, C. (2014, January 9). See how housing and transportation costs hold the poor back. Retrieved from <https://ggwash.org/view/33421/see-how-housing-and-transportation-costs-hold-the-poor-back>
24. McNeil, N., Dill, J., MacArthur, J., Broach, J. & Howland, S. (2017). Breaking barriers to bike share: Insights from residents of traditionally underserved neighborhoods. Portland, OR: Transportation Research and Education Center. Retrieved from <https://doi.org/10.15760/trec.176>
25. Pheley, A. M. (1999). Mass transit strike effects on access to medical care. *Journal of Health Care for the Poor and Underserved*, 10(4): 389–396.
26. Ogilvie, F. & Goodman, A. (2012). Inequalities in usage of a public bicycle sharing scheme: Socio-demographic predictors of uptake and usage of the London (UK) cycle hire scheme. *Preventive Medicine*, 55(1): 40-45.
27. Litman, T. (2002). Evaluating transportation equity. *World Transport Policy & Practice*, 8(2): 50-65. Retrieved from <https://pdfs.semanticscholar.org/fa6c/6421f37a60cb8d4bde401ebd384ac174bc40.pdf>
28. Chetty, R. & Hendren, N. (2015). The impacts of neighborhoods on intergenerational mobility: Childhood exposure effects and county-level estimates. Cambridge, MA: Harvard University and NBER, 1-143. Retrieved from https://scholar.harvard.edu/files/hendren/files/nbhds_paper.pdf
29. Ibid.
30. Robert Wood Johnson Foundation. (2012, October 25). Better Transportation Options = Healthier Lives Infographic. Retrieved from <https://www.rwjf.org/en/library/infographics/infographic--better-transportation-options---healthier-lives.html>
31. Centers for Disease Control and Prevention. (2015). Transportation health impact assessment toolkit: For planning and health professionals. Retrieved from https://www.cdc.gov/healthyplaces/transportation/HIA_toolkit.htm
32. Centers for Disease Control and Prevention. (2015). Transportation and health tool. Retrieved from <https://www.cdc.gov/healthyplaces/healthtopics/transportation/tool.htm#>

33. Health Outreach Partners. (2014). Building, expanding and sustaining transportation programs: Key lessons from HOP's "Overcoming Obstacles to Health Care: Transportation Models that Work" Project. Retrieved from <https://outreach-partners.org/2014/03/01/building-expanding-and-sustaining-transportation-programs-key-lessons-from-hops-overcoming-obstacles-to-health-care-transportation-models-that-work-project/>
34. Tierney, W. M., Harris, L. E., Gaskins, D. L., Zhou, X. H., Eckert, G. J., Bates, A. S., et al. (2000). Restricting medicaid payments for transportation: Effects on inner-city patients' health care. *The American Journal of the Medical Sciences*, 319(5): 326–333.
35. Health Research & Educational Trust. (2017, June). *Social determinants of health series: Food insecurity and the role of hospitals*. Chicago, IL: Author. Retrieved from <http://www.hpoe.org/Reports-HPOE/2017/determinants-health-food-insecurity-role-of-hospitals.pdf>
36. Ibid.
37. Syed, S. T., Gerber, B. S. & Sharp, L. K. (2013). Traveling towards disease: Transportation barriers to health care access. *Journal of Community Health*, 38(5): 976-993. Retrieved from <https://link.springer.com/article/10.1007/s10900-013-9681-1>
38. Ibid.
39. Sviokla, J., Schroeder, B. & Weakland, T. (2010). How behavioral economics can help cure the health care crisis. *Harvard Business Review*. Retrieved from <https://hbr.org/2010/03/how-behavioral-economics-can-h>
40. Kheirkhah, P., Feng, Q., Travis, L. M., Tavakoli-Tabasi, S. & Sharafkhaneh, A. (2016). Prevalence, predictors and economic consequences of no-shows. *BMC Health Services Research*, 16: 13. Retrieved from <http://doi.org/10.1186/s12913-015-1243-z>
41. Syed, S. T., Gerber, B. S. & Sharp, L. K. (2013). Traveling towards disease: Transportation barriers to health care access. *Journal of Community Health*, 38(5): 976-993. Retrieved from <https://link.springer.com/article/10.1007/s10900-013-9681-1>
42. Robert Wood Johnson Foundation. (2012, October). *How does transportation impact health?* Princeton, NJ: Author. Retrieved from http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2012/rwjf402311
43. Raynault, E. & Christopher, E. (2013). How does transportation affect public health? *Public Roads*, 76(6). Retrieved from <https://www.fhwa.dot.gov/publications/publicroads/13mayjun/05.cfm>
44. Litman, T. (2002). Evaluating transportation equity. *World Transport Policy & Practice*, 8(2), 50-65. Retrieved from <https://pdfs.semanticscholar.org/fa6c/6421f37a60cb8d4bde401ebd384ac174bc40.pdf>