Public Health and Society

https://phsjournal.org

Transport Accessibility Gaps and Care Delays in Disabled Patient Groups: Survey Analysis

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Abstract

The intersection of transportation accessibility and healthcare utilization represents a critical area of study within public health and urban sociology. Individuals with disabilities frequently experience compounded disadvantages when navigating built environments, which directly impacts their ability to access timely medical care. This paper presents a comprehensive survey analysis examining the specific transport accessibility gaps that contribute to care delays among disabled patient groups. By synthesizing self-reported data from a large-scale sociological survey, this research identifies the primary infrastructural, systemic, and socioeconomic barriers that hinder reliable transit to healthcare facilities. The study investigates multiple modalities of transport, including public transit networks, specialized paratransit services, and private vehicle utilization, evaluating how deficiencies in each mode correlate with missed appointments, delayed diagnoses, and interrupted treatment regimens. The findings reveal a significant statistical relationship between the frequency of transport disruptions and the severity of subsequent care delays, particularly among individuals with mobility and visual impairments. Furthermore, the analysis highlights disparities between urban and rural environments, demonstrating that geographic isolation exacerbates the vulnerabilities of disabled populations. Ultimately, this research provides evidence-based insights for urban planners, healthcare administrators, and policymakers to develop integrated, inclusive transport frameworks that mitigate care delays and promote equitable health outcomes for disabled communities.

Keywords: Transport Accessibility; Care Delays; Disability Studies; Healthcare Equity; Disabled Patient Groups

1. Introduction

1.1 Background and Context

The fundamental right to health is inextricably linked to the ability to physically access healthcare services. For the general population, transportation to and from medical facilities is often viewed as a routine logistical consideration. However, for individuals living with disabilities, transportation represents a complex, multi-layered determinant of health that can dictate the quality, frequency, and timeliness of medical care received. The built environment, encompassing public transit systems, pedestrian infrastructure, and specialized transit services, frequently fails to accommodate the diverse needs of the disabled community. Consequently, transport accessibility gaps have emerged as a primary driver of healthcare disparities. Extensive research has demonstrated that

when transport systems are unreliable, physically inaccessible, or economically prohibitive, disabled patients are forced to delay or forgo necessary medical interventions [1]. These care delays are not benign; they often lead to the exacerbation of chronic conditions, increased reliance on emergency medical services, and overall deterioration of health outcomes. Understanding the specific mechanisms through which transport barriers translate into care delays is essential for developing targeted interventions. This requires a comprehensive examination of the multifaceted challenges disabled individuals face, ranging from the physical absence of ramps and elevators to the systemic inefficiencies of paratransit scheduling and the profound economic burdens associated with modified private vehicles [2]. The social model of disability posits that individuals are disabled not merely by their physical or cognitive impairments, but by the societal and environmental barriers that restrict their participation. In the context of healthcare access, this model underscores the urgent need to address transport accessibility as an issue of systemic inequity rather than an individual deficit.

1.2 Problem Statement and Research Objectives

Despite the recognized importance of transportation in healthcare delivery, empirical data detailing the exact nature and consequences of transport accessibility gaps for disabled patients remains fragmented. Existing public health surveys often capture broad metrics of healthcare access but frequently overlook the nuanced, operational failures of transit systems that specifically affect individuals with varying types of disabilities. For instance, a survey might record that a patient missed an appointment due to a transportation issue, but fail to differentiate whether the issue was a broken wheelchair lift on a municipal bus, a multi-hour delay by a paratransit provider, or the inability to navigate a poorly maintained sidewalk leading to a transit stop [3]. This lack of granular data impedes the formulation of effective policy solutions. Therefore, the primary objective of this study is to conduct a rigorous survey analysis to quantify and qualify the transport accessibility gaps experienced by disabled patient groups and to directly correlate these gaps with specific instances of care delays. Secondary objectives include analyzing how these experiences differ across various disability types, comparing urban and rural transport landscapes, and evaluating the effectiveness of currently available specialized transit services. By addressing these research questions, this study aims to fill a significant void in current public health literature and provide actionable intelligence for stakeholders committed to fostering inclusive urban environments and equitable healthcare systems. The subsequent sections of this paper will delve into the theoretical background, outline the methodology employed to capture this data, present the analytical framework, and discuss the profound implications of the findings for future policy and planning [4].

2. Literature Review and Theoretical Background

2.1 Historical Perspectives on Transport and Disability

The evolution of transport accessibility for disabled individuals has been a gradual, often highly contested process driven by civil rights movements and subsequent legislative mandates. Historically, public transportation systems were designed without consideration for individuals with mobility, visual, or cognitive impairments. It was not until the latter half of the twentieth century that concerted advocacy efforts began to yield structural changes. Landmark legislation in various global jurisdictions established foundational requirements for equal access to public services, mandating the retrofitting of existing infrastructure and the inclusive design of new transit vehicles and facilities [5]. However, the implementation of these legal frameworks has been uneven. Early compliance often focused on the most visible aspects of accessibility, such as the installation of ramps and designated seating areas, while neglecting more systemic issues like route connectivity, transit schedule reliability, and the provision of accessible information formats for sensory-impaired

individuals [6]. The legacy of this piecemeal approach is still evident in many contemporary urban transport networks, where a bus may be equipped with a functional wheelchair lift, but the bus stop itself remains inaccessible due to absent curb cuts or obstructed pathways. This historical context is crucial for understanding the current landscape, as it highlights that legislative mandates, while necessary, are insufficient without rigorous enforcement, continuous funding, and a holistic approach to universal design. The transition from a medical model, which viewed disability as a personal tragedy to be cured or managed, to a social model, which views disability as a societal failure to accommodate difference, has profoundly influenced recent discourse on transport equity [7].

2.2 The Intersection of Mobility and Healthcare Access

The relationship between physical mobility and healthcare access is reciprocal and deeply synergistic. Adequate mobility enables individuals to engage in preventative care, attend routine consultations, and adhere to ongoing treatment plans, thereby maintaining or improving their health status. Conversely, compromised health can further restrict mobility, creating a detrimental feedback loop. For disabled patient groups, this intersection is particularly precarious. Chronic conditions common among disabled populations often require frequent interactions with the healthcare system, amplifying the need for reliable transportation. Literature indicates that the inability to secure accessible transport is consistently cited as a primary reason for missed outpatient appointments [8]. Missed appointments have cascading effects on the healthcare continuum. They disrupt the continuity of care, leading to delayed diagnoses of secondary conditions, the progression of underlying diseases, and a shift from proactive management to reactive, crisis-driven medical interventions. Emergency department utilization rates are disproportionately high among disabled individuals who lack reliable transit, as minor health issues escalate into emergencies due to a lack of timely outpatient intervention [9]. Furthermore, the psychological toll of navigating an inaccessible transport system cannot be understated. The anxiety, physical exertion, and loss of dignity associated with arduous transit journeys often deter disabled individuals from seeking medical care altogether, a phenomenon known as transport-induced healthcare avoidance [10]. This avoidance behavior is a silent but pervasive contributor to severe care delays and widening health disparities.

2.3 Existing Gaps in Survey Methodologies

While the broader impact of transport barriers on healthcare access is acknowledged in academic circles, the methodologies used to investigate this phenomenon have historically exhibited significant limitations. Many large-scale national health surveys utilize standardized questionnaires that do not capture the complexity of the disabled transit experience. Questions are typically binary, asking whether a respondent had trouble accessing care due to transportation, without probing the specific modalities used, the nature of the disruption, or the downstream consequences of the delay [11]. Furthermore, traditional survey deployment methods often inadvertently exclude the most marginalized segments of the disabled population. For example, telephone surveys may be inaccessible to deaf individuals, while web-based surveys may pose insurmountable barriers for those with cognitive impairments, severe manual dexterity issues, or limited digital literacy [12]. Additionally, existing literature frequently treats the disabled population as a monolith, failing to disaggregate data based on the type and severity of impairment. The transport barriers faced by an individual utilizing a motorized wheelchair are fundamentally different from those experienced by a visually impaired individual relying on acoustic signals and tactile paving. Consequently, there is a pressing need for specialized survey instruments designed with inclusive methodologies that capture high-resolution, disaggregated data. Such instruments are

essential for moving beyond generalized acknowledgments of inequality toward precise, targeted policy interventions that address the specific infrastructural and systemic failures driving care delays [13].

3. Research Methodology and Survey Design

3.1 Survey Development and Instrument Design

To address the methodological shortcomings identified in the literature, this study developed a bespoke, comprehensive survey instrument specifically tailored to evaluate transport accessibility and its impact on healthcare utilization among disabled individuals. The questionnaire was constructed through a rigorous, multi-stage process involving consultation with disability advocacy groups, public health researchers, and urban transport planners. The resulting instrument comprised four distinct sections. The first section collected detailed demographic information, including age, gender, socioeconomic status, geographic location, and specific disability typologies. The second section focused on transit utilization patterns, prompting respondents to identify their primary, secondary, and tertiary modes of transportation to healthcare facilities, the average distance traveled, and the frequency of medical appointments. The third section constituted the core of the survey, deploying a matrix of Likert-scale questions and multiple-choice items designed to measure the frequency and severity of specific accessibility barriers across different transport modes. Questions in this section addressed issues such as physical infrastructure failures, paratransit delays, driver unresponsiveness, and affordability constraints [14]. The final section investigated the direct consequences of these transport barriers, asking respondents to quantify the number of delayed or missed appointments over the preceding twelve months and to describe the subsequent impact on their health and treatment adherence. To ensure maximum accessibility, the survey was made available in multiple formats, including plain language, large print, screen-reader compatible digital versions, and assisted administration via trained interviewers [15].

3.2 Participant Recruitment and Sampling Strategy

Securing a representative sample of disabled individuals requires a deliberate and multifaceted recruitment strategy that transcends traditional random digit dialing or online panel sampling. This study employed a stratified purposive sampling approach, designed to ensure adequate representation across diverse disability categories, age cohorts, and geographic settings. Recruitment was conducted through established networks, including community health centers, specialized rehabilitation clinics, local disability advocacy organizations, and municipal paratransit user registries. These partnerships were crucial for building trust and reaching individuals who might otherwise be isolated from mainstream research initiatives [16]. The sampling strata were defined by disability type encompassing mobility, visual, auditory, and cognitive impairments, as well as by geographic classification dividing respondents into urban, suburban, and rural cohorts. This stratification was essential for enabling robust comparative analyses. Informed consent procedures were rigorously implemented, with consent forms adapted for varying levels of cognitive and sensory ability. Potential participants were assured of the confidentiality of their responses and informed that the data would be utilized exclusively for academic research and policy advocacy purposes. The recruitment phase spanned six months, ultimately yielding a diverse and comprehensive dataset that provided a solid foundation for subsequent empirical analysis [17]. Strict data quality control measures were implemented during the collection phase, including logic checks within the digital survey platform and manual reviews of interviewer-administered responses to identify and rectify missing or anomalous data entries.

4. Data Analysis and Statistical Modeling

4.1 Qualitative Data Processing

While the primary thrust of the survey was quantitative, several open-ended questions were included to capture the lived experiences and nuanced narratives of the participants. The processing of this qualitative data required a systematic approach to extract meaningful patterns and themes. A thematic analysis framework was employed, beginning with the meticulous transcription and familiarization of all text-based responses. Two independent researchers engaged in a process of open coding, assigning descriptive labels to individual statements related to transport challenges and care delays [18]. These initial codes were then collated into broader categories, such as systemic unreliability, infrastructure hostility, economic burden, and provider insensitivity. Through iterative review and consensus-building, the researchers refined these categories into overarching themes that encapsulated the core qualitative findings. This thematic structure served a dual purpose. Firstly, it provided rich contextual background that illuminated the raw statistical data, offering insight into the emotional and psychological toll of transport barriers. Secondly, the qualitative themes were utilized to inform the interpretation of the quantitative models, ensuring that the statistical conclusions remained grounded in the actual experiences reported by the disabled participants. For example, recurring mentions of anxiety related to paratransit scheduling unpredictability in the open-ended responses helped to explain the high correlation observed between paratransit reliance and elective healthcare avoidance in the quantitative analysis [19].

4.2 Quantitative Assessment Techniques

The quantitative analysis phase utilized advanced statistical software to process the structured survey responses. Initial data preparation involved extensive cleaning, including the treatment of missing values through multiple imputation techniques, ensuring that the integrity of the dataset was maintained without introducing undue bias. Descriptive statistics were generated to summarize the demographic profile of the sample and to establish baseline frequencies for transport utilization and missed appointments. To evaluate the relationship between transport accessibility gaps and care delays, a series of inferential statistical models were constructed. Analysis of Variance was utilized to compare the mean rates of missed appointments across different disability typologies and geographic locations, identifying significant variations between these groups. Subsequently, multivariable logistic regression models were developed to isolate the independent effect of specific transport barriers on the likelihood of experiencing severe care delays, defined as missing three or more critical appointments within the reporting period [20]. The regression models controlled for potential confounding variables, including age, income, overall health status, and distance to the nearest healthcare facility. This rigorous modeling approach allowed for the determination of adjusted odds ratios, providing a precise quantification of how different infrastructural and systemic failures independently contribute to healthcare disruption. Furthermore, interaction terms were introduced into the models to investigate whether the impact of certain transport barriers was amplified for specific subgroups, such as the compounding effect of low income and rural residency on transport-induced care delays [21].

5. Results and Discussion

5.1 Demographic Characteristics and Transport Usage Patterns

The final analytical sample consisted of a diverse cohort of participants representing a wide spectrum of disability profiles and socioeconomic backgrounds. The demographic distribution confirmed the effectiveness of the stratified sampling strategy, yielding robust subsamples for mobility, visual, and cognitive impairments. Analysis of transport usage patterns revealed deep systemic reliance on specialized transit services, particularly among those with severe mobility constraints. Public transit utilization was notably lower among the surveyed population compared to

regional averages for non-disabled individuals, reflecting the persistent infrastructural barriers that discourage disabled ridership. Many respondents indicated that while main transit hubs might be nominally accessible, the pathways leading to them, often plagued by uneven paving or lack of pedestrian crosswalks, rendered the entire journey unfeasible. Private vehicle usage, whether as a driver or a passenger, was highly correlated with higher socioeconomic status, underscoring the severe economic stratification inherent in accessible transportation. Those who could afford modified vehicles or private hired transport reported significantly fewer logistical challenges, though they still faced issues related to accessible parking at medical facilities.

Table 1: Summary of Transport Modality Utilization by Disability Type

Disability Category	Primary Public Transit (%)	Specialized Paratransit (%)	Private Vehicle (%)	Other / Non-motorized (%)
Public Transit Accessibility	12.4	55.6	28.5	3.5
Visual Impairment	45.2	22.1	18.4	14.3
Cognitive Impairment	31.8	34.5	30.2	3.5
Auditory Impairment	52.1	5.4	38.0	4.5
Multiple Impairments	8.5	62.3	25.1	4.1

The data presented in Table 1 illustrates the stark divergence in transit reliance based on impairment type. Individuals with multiple impairments and severe mobility issues are overwhelmingly dependent on specialized paratransit systems. This dependency represents a critical vulnerability, as paratransit services are frequently characterized by strict advance booking requirements, lengthy shared-ride routing, and chronic unreliability. Conversely, individuals with visual and auditory impairments demonstrate a higher reliance on general public transit, which exposes them to a different set of accessibility gaps, such as the absence of audio-visual stop announcements and overly complex transit interchanges.

5.2 Correlation Between Accessibility Gaps and Care Delays

The central hypothesis of this study, proposing a direct and substantial correlation between transport accessibility gaps and instances of care delays, was strongly supported by the statistical modeling. Respondents who reported high frequencies of transport disruptions were exponentially more likely to report having missed or delayed critical medical appointments. The multivariable logistic regression analysis isolated specific barriers that served as the strongest predictors of healthcare disruption. Foremost among these was the unreliability of scheduled transit services. For paratransit users, late arrivals or sudden cancellations were the primary culprits leading to missed clinic slots, which are often strictly enforced by healthcare providers. A missed appointment due to a transport failure frequently resulted in a rescheduling delay of several weeks or even months, significantly interrupting the continuity of care.

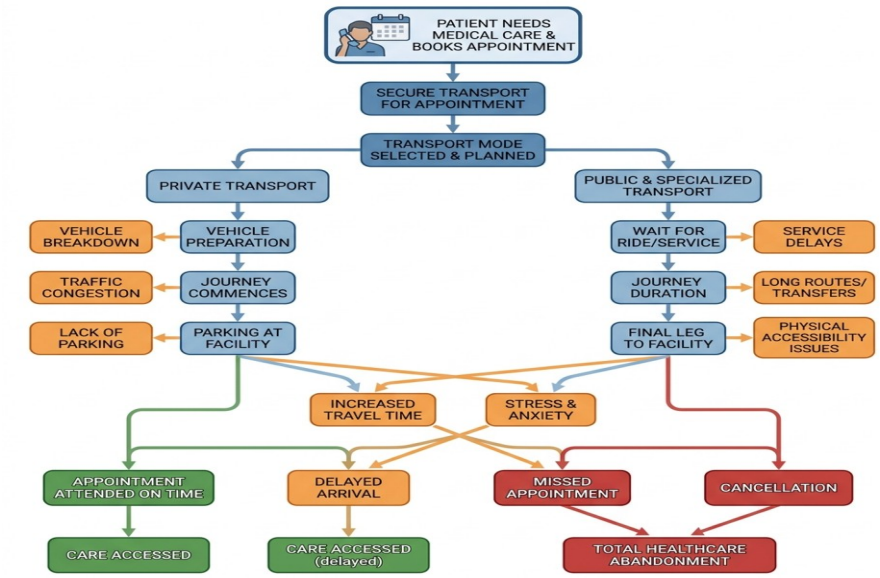

Figure 1: Comprehensive Schematic of Transport Barrier Impacts on Healthcare Utilization Pathways

Figure 1 provides a structural visualization of the pathways through which logistical barriers translate into negative health outcomes. The analysis also revealed that affordability represents a massive secondary barrier. Even when accessible commercial transport options, such as specialized ride-sharing services, are available, their prohibitive cost forces low-income disabled individuals to rely on heavily subsidized, yet vastly inferior, municipal options. The compounding effect of geographic isolation further exacerbates this issue. Rural respondents reported the highest absolute rates of care delays, driven by the sheer lack of transit infrastructure and the vast distances required to reach specialized medical centers. In rural contexts, the failure of a single transport arrangement often means the complete forfeiture of medical care for that day, as alternative backup options simply do not exist.

5.3 Synthesizing Findings with Existing Literature

The findings from this survey align with and significantly expand upon the foundational literature regarding health disparities and social determinants of health. While previous studies have broadly identified transportation as a barrier, this analysis provides the granular empirical evidence necessary to understand the exact mechanisms of failure. The data confirms the assertions made by the social model of disability, demonstrating that the primary cause of care delays is not the medical condition of the patient, but the rigid, unaccommodating nature of the transport and healthcare scheduling systems. The high incidence of missed appointments due to paratransit failures highlights a systemic disconnect between urban transit authorities and healthcare administrators. Transit systems prioritize route efficiency and cost-containment, while medical clinics prioritize strict scheduling to maximize patient throughput. The disabled patient is caught in the friction between these two inflexible systems.

Table 2: Logistic Regression Output Indicating Odds of Missed Appointments

Transport Barrier Variable	Adjusted Odds Ratio (AOR)	95% Confidence Interval	P-value
Paratransit Delay > 30 mins	3.42	2.85 - 4.15	< 0.001
Lack of Accessible Pedestrian Paths	2.15	1.78 - 2.62	< 0.01
Transit Cost Exceeds 10% Income	2.88	2.10 - 3.75	< 0.001
Rural Geographic Location	4.10	3.25 - 5.12	< 0.001
Unavailability of Audio/Visual Aids	1.65	1.22 - 2.15	< 0.05

The regression results shown in Table 2 quantify these observations. An Adjusted Odds Ratio of 4.10 for rural location indicates a profound geographic disparity that demands immediate policy

intervention. Furthermore, the significant impact of missing accessible pedestrian paths underscores the importance of the whole-journey approach to transit planning. A perfectly accessible bus is rendered useless if the patient cannot safely navigate the three blocks from their home to the bus stop. This points to a critical failure in municipal coordination, where transit authorities and public works departments operate in silos, neglecting the interconnected nature of urban mobility. These findings call for a paradigm shift in how we evaluate healthcare accessibility, moving away from proximity-based metrics towards comprehensive mobility-based assessments.

6. Conclusion and Policy Implications

6.1 Summary of Key Findings

This comprehensive survey analysis has unequivocally demonstrated that transport accessibility gaps are a primary, systemic driver of care delays among disabled patient groups. The data reveals that these barriers are not isolated inconveniences, but pervasive structural failures that systematically disenfranchise individuals from their fundamental right to healthcare. Specialized paratransit systems, upon which the most vulnerable populations rely, are plagued by inefficiencies and unreliability, directly correlating with high rates of missed and delayed medical appointments. Furthermore, the physical infrastructure surrounding public transit networks often remains hostile to those with mobility and sensory impairments, effectively nullifying the accessibility features of the transit vehicles themselves. The analysis also highlights profound disparities based on socioeconomic status and geographic location, with low-income and rural disabled individuals facing the most severe compounding barriers. The consequences of these transport-induced care delays are severe, leading to compromised health outcomes, decreased quality of life, and increased long-term costs for the healthcare system.

6.2 Recommendations for Urban Planning and Healthcare Policy

Addressing these entrenched issues requires a coordinated, multi-sectoral approach that bridges the gap between urban planning, transit administration, and healthcare delivery. Policymakers must mandate and fund the implementation of the whole-journey accessibility concept, ensuring seamless, barrier-free transitions from the home environment to the medical facility. This includes aggressive investment in pedestrian infrastructure, such as tactile paving, universally designed crosswalks, and continuous accessible pathways linking residential areas to transit hubs. Regarding specialized transit, there is an urgent need to modernize paratransit operations using advanced routing algorithms and real-time tracking technologies to improve reliability and reduce passenger wait times. Simultaneously, healthcare systems must adopt more flexible and accommodating scheduling practices for patients who rely on public or specialized transit, eliminating punitive measures for unavoidable, transport-related tardiness. The expansion of telehealth services should be pursued as a supplementary tool to mitigate the need for physical travel for routine consultations, though it must not be used as an excuse to defund accessible physical transport infrastructure. Cross-institutional task forces, comprising disabled advocates, transit planners, and healthcare administrators, should be established to oversee the integration of transit and health policies.

6.3 Limitations and Future Research Directions

While this study provides robust insights, it is not without limitations. The reliance on self-reported survey data introduces the potential for recall bias, as participants may over-report or under-report the frequency of past transport disruptions and missed appointments. Additionally, despite the stratified sampling approach, the findings may not be entirely generalizable to all cultural or international contexts, given the vast differences in municipal governance, healthcare funding models, and existing infrastructure across different global regions. Future research should seek to

validate these self-reported findings through the integration of objective administrative data, such as cross-referencing municipal transit logs with electronic health records to precisely map the correlation between transit delays and clinic no-shows. Longitudinal studies are also required to track the long-term health trajectories of disabled individuals who experience chronic transport-induced care delays. Finally, ongoing research must continuously evaluate the efficacy of emerging mobility solutions, such as autonomous vehicles and micro-transit models, to determine their potential to either alleviate or exacerbate existing transport accessibility gaps for the disabled community. Ensure sustained academic inquiry into this intersection is vital for building truly inclusive societies.

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