

CHILD ROAD TRAFFIC INJURIES IN KARACHI

A QUALITATIVE ANALYSIS OF PATTERNS, RISK FACTORS, AND SYSTEMIC GAPS



KEY PATTERNS (QUALITATIVE)



High-risk areas near schools, markets, and busy corridors



Peak incidents during school opening/closing hours and evenings

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ABSTRACT

Road traffic injuries represent a significant and growing public health concern in urban Pakistan, with children among the most vulnerable populations. This study examines the patterns and underlying risk factors of child road traffic accidents in Karachi. The study contributes to the limited evidence base on child-specific road safety in Pakistan and offers recommendations for policy reform, urban planning, and community-level interventions aimed at reducing preventable injuries and fatalities.

1. INTRODUCTION

Road traffic injuries are a leading cause of death and disability globally, particularly in low- and middle-income countries where rapid urbanization often outpaces the development of safe infrastructure and effective regulatory systems. In Karachi, Pakistan's largest city, rising population density, increased reliance on motorcycles, and weak enforcement of traffic laws have collectively created a high-risk environment for road users.

Within this context, children face disproportionate risks due to developmental limitations in hazard perception, dependence on adults for mobility, and frequent exposure to unsafe commuting conditions. Their everyday interactions with roads whether as pedestrians, passengers, or informal commuters often occur in environments that are not designed with their safety in mind.

Despite the scale and severity of the issue, policy and programmatic responses remain largely generalized, with limited attention to the specific vulnerabilities and experiences of children. Existing approaches tend to emphasize broad road safety measures without adequately addressing how systemic, behavioral, and infrastructural factors uniquely affect child safety.

This study seeks to address this gap by offering a qualitative, child-centered analysis of road traffic injuries in Karachi. It examines the underlying risk factors, lived experiences, and systemic conditions that contribute to these incidents, with

the aim of informing more targeted and effective interventions.

2. BACKGROUND AND LITERATURE REVIEW

Road traffic injuries are recognized as a major global health challenge, accounting for approximately 1.19 million deaths annually, with children and young people among the most affected groups. In low- and middle-income countries, the burden is disproportionately high due to rapid urbanization, weak enforcement of traffic regulations, and limited investment in safe infrastructure.

Existing literature highlights that children are particularly vulnerable road users. Their limited cognitive and perceptual abilities reduce their capacity to judge speed, distance, and risk, especially in complex urban traffic environments. Studies across South Asia indicate that child pedestrians and motorcycle passengers face the highest levels of risk, often due to inadequate pedestrian infrastructure, lack of helmet use, and unsafe transport practices.

In Pakistan, research on road traffic injuries has primarily focused on overall mortality and injury trends, with limited age-specific disaggregation. Available studies suggest that motorcycles are involved in a significant proportion of accidents, while pedestrian injuries remain common in densely populated urban areas. However, there is a lack of child-specific analysis, particularly in megacities like Karachi where traffic density, informal transport systems, and weak enforcement intersect.

Urban planning and transport policies in Karachi have historically prioritized vehicular flow over pedestrian safety. The absence of safe crossings, sidewalks, and school-zone protections further exacerbates risks for children. Additionally, gaps in emergency response systems, including delays in pre-hospital care and limited trauma support, contribute to preventable fatalities and long-term disabilities.

While global frameworks emphasize a “Safe Systems” approach integrating safer roads, safer vehicles, safer road users, and effective post-crash response implementation in Pakistan remains fragmented. There is limited evidence on how these systemic gaps specifically affect children, underscoring the need for focused research.

This study builds on existing literature by providing a child-centered analysis of road traffic injuries in Karachi, combining lived experiences with documented cases to better understand both risk and response.

3. ANALYTICAL FRAMEWORK

This study adopts a multi-layered analytical framework to examine child road traffic accidents:

Layer	Focus	Key Question
System Level	Urban infrastructure, traffic systems, and enforcement	Where and why do accidents occur?
Behavioral Level	Road-use practices of drivers, caregivers, and children	What behaviors increase risk?
Outcome Level	Injuries, fatalities, and long-term impacts	What are the consequences for children?

This framework enables a structured analysis that links systemic conditions and behavioral factors to child-specific outcomes, allowing for a more comprehensive understanding of risk and response.

4. METHODOLOGY

This study adopts a qualitative research design to develop a deeper, context-rich understanding of child road traffic accidents in Karachi. Given the complexity of urban traffic systems and the limited availability of reliable, disaggregated child-specific data, this approach is considered most appropriate for exploring lived experiences, systemic conditions, and institutional responses. This design is particularly suitable for examining how infrastructure, behavior, and emergency

response systems interact in ways that contribute to injury and fatality risks among children.

The qualitative component of the study draws on multiple sources of evidence to develop a broader understanding of the issue. Secondary data is collected from newspapers and verified online news platforms to document reported incidents, patterns, and public reporting of road traffic accidents involving children. In addition, relevant institutional and organizational websites are reviewed to gather contextual information on policy frameworks, traffic management systems, and emergency response structures. Selected reported incidents are also used to illustrate circumstances, contributing factors, and consequences of specific child road traffic accidents.

Primary qualitative information is also supplemented by a limited number of informal interviews conducted with key stakeholders associated with child road traffic incidents. These include health practitioners, rescue workers, and affected families, who shared brief accounts of their experiences and observations related to road traffic accidents. Given the limited scope of these discussions, the interviews are used to provide contextual understanding alongside secondary data sources rather than as a primary standalone dataset.

Data collected from these sources is analyzed qualitatively to identify recurring patterns and themes across reports, interviews, and related documents. The approach helps interpret key issues related to risk exposure, infrastructural conditions, and systemic gaps affecting child road safety. Insights from different sources are reviewed comparatively to support broader contextual understanding of the issue.

The study acknowledges certain limitations. The availability of disaggregated child-specific road traffic data remains limited, which restricts a comprehensive understanding of the overall burden of the issue. In addition, minor injuries are often underreported in official records and media sources, which may result in the underrepresentation of non-fatal incidents. Despite these limitations, the use of multiple qualitative sources helps provide broader contextual insights into child road traffic injuries in Karachi.

5. FINDINGS AND ANALYSIS

5.1 Trends in Child Road Traffic Accidents

The analysis of secondary sources, including media reports, case studies, and institutional documentation, indicates a persistent and concerning pattern of child road traffic accidents in Karachi. Rather than showing consistent improvement, the evidence suggests fluctuations in reported incidents, with noticeable spikes in densely populated urban corridors and during peak traffic hours.

A recurring observation across sources is that child road traffic incidents are not isolated or random events but are embedded within broader urban mobility patterns. Many reported cases occur near schools, in residential areas with limited pedestrian infrastructure, and along major arterial roads where traffic flow is high and safe crossings are lacking. The findings suggest that child road safety in Karachi is less a matter of individual risk and more a systemic urban safety issue.

5.2 High-Risk Categories

The findings consistently identify three primary high-risk categories of children affected by road traffic incidents. The first group includes child pedestrians, who are frequently exposed to danger due to the absence of safe crossing points, sidewalks, and traffic calming measures. These children often navigate complex traffic environments without adequate supervision or protective infrastructure.

The second high-risk group consists of children traveling as passengers on motorcycles, which remains a dominant mode of transport in Karachi. In many cases, the high number of children on motorcycles and absence of proper seating arrangements, significantly increasing the severity of injuries in the event of a collision. This risk is further compounded by unsafe driving practices, including speeding, reckless maneuvering, overtaking in congested traffic, and the absence or non-use of basic safety features such as side mirrors.

The third high-risk group is children using school vans, the most common forms of transport for thousands of children in Karachi. Among other

high-risk groups include the children playing on the streets. These children, mostly aged between 8-12 years, also became the victims of accidents often involving heavy vehicles like buses, tankers, and trucks.

Across multiple case narratives, motorcycle-related incidents emerge as a leading contributor to both fatal and non-fatal injuries among children, reflecting the combined effect of inadequate safety measures and risky driving behaviors.

5.3 Key Risk Factors

The analysis identifies a combination of behavioral, infrastructural, and institutional factors contributing to child road traffic accidents. At the behavioral level, risky driving practices such as speeding, reckless overtaking, and non-compliance with traffic rules are frequently reported. On the caregiver side, limited awareness of child safety practices behavior further increases vulnerability.

Another significant contributing factor is the overloading of children in school vans. Overcrowded school vans, primarily operated by private transporters and drivers, are a common sight in Karachi, particularly during morning and afternoon school hours. Many of these vehicles operate far beyond their seating capacity, often without any effective monitoring or regulatory oversight. Due to severe overcrowding, children are sometimes forced to stand on the footboard or near the vehicle entrance, placing them at considerable risk.

In several reported cases, drivers dropped children near their schools or homes rather than ensuring safe entry or exit points. As a result, young children are often required to cross single or multiple roads on their own, significantly increasing their daily exposure to road traffic hazards.

Other contributing factors include teenage boys riding motorcycles without licenses or proper training, increasing the likelihood of accidents involving children. A significant number of fatalities are also linked to reckless driving by heavy vehicles such as dumpers, trailers, and water tankers. In many cases, accidents occur

when children are left unattended on or near busy roads.

Children playing cricket or football on the streets is another factor contributing to the rise in road traffic accidents among children. While playing, children often run onto roads and service lanes without awareness of oncoming traffic, resulting in numerous serious injuries and fatalities. The reckless driving of two-wheelers further aggravates the situation.

At the infrastructural level, inadequate pedestrian facilities, lack of designated school zones, poor road design, and the absence of effective traffic-calming mechanisms are repeatedly highlighted. Roads in many high-risk areas are designed primarily to facilitate vehicle flow rather than ensure pedestrian safety, creating hazardous conditions for children. This situation is further compounded by weak enforcement around schools, where the absence of traffic wardens, crossing guards, school-time speed control measures, and regulated pick-up and drop-off systems significantly increases children's exposure to road traffic risks.

At the broader contextual level, socioeconomic vulnerability emerges as a key underlying factor, where lower-income families are more dependent on motorcycles and other forms of unsafe transport, while children in densely populated low-income neighborhoods often play on streets due to the absence of safe recreational spaces. These communities are also more likely to experience weaker infrastructure and limited public investment in safety-related urban services. This vulnerability is further compounded by limited emergency response and trauma care capacity, where delays in emergency services and the lack of adequate pediatric trauma facilities can significantly increase fatalities and long-term disabilities following road traffic injuries.

Parental and adult supervision challenges also contribute to the risk environment, particularly in contexts where working parents, overcrowded living conditions, insufficient safe play areas, and reliance on older siblings result in reduced direct supervision of young children. In addition, visibility and road environment issues such as poor street lighting, encroachments, illegal parking near schools, inadequate signage, and

broken sidewalks further intensify exposure to road hazards. Institutionally, weak enforcement of traffic laws and inconsistent monitoring continue to play a critical role in sustaining these risks, particularly in high-density and informal urban settlements where regulatory oversight remains limited and uneven.

5.4 Systemic Gaps

The findings point to several interconnected systemic gaps that collectively contribute to the sustained burden of child road traffic injuries. One of the most significant gaps is the fragmentation of urban transport governance, where responsibilities are spread across multiple agencies with limited coordination. This results in inconsistent planning and weak accountability for road safety outcomes.

Another critical gap is the lack of child-specific road safety planning within broader urban transport strategies. Current policies tend to treat road users as a homogeneous group, failing to account for the distinct vulnerabilities of children. This includes insufficient integration of school safety zones, pedestrian-friendly infrastructure, and child-focused awareness campaigns.

Emergency response systems also show certain limitations. Delays in pre-hospital care, limited trauma preparedness, and uneven availability of emergency services may affect injury outcomes in some cases. Reported incidents also suggest that response times and access to trauma care can influence the severity and long-term consequences of injuries.

The study also identified gaps in the availability, reliability, and coordination of road traffic injury data related to children in Karachi. Data maintained by hospitals, police departments, rescue services, and other institutions often remain fragmented or inconsistent, making it difficult to fully understand the patterns and burden of child road traffic injuries. In many cases, incidents involving minor injuries or near misses may not be formally documented, while variations in reporting mechanisms further affect data consistency and comparability. The absence of an integrated child-focused road safety database also limits evidence-informed planning and targeted interventions.

Overall, the analysis highlights that child road traffic accidents in Karachi are not merely the result of individual behavior, but are deeply embedded in systemic urban, institutional, and governance failures.

6. DISCUSSION & CONCLUSION

The findings of this study indicate that child road traffic injuries in Karachi cannot be understood as isolated or accidental events. Rather, they emerge from a complex interplay of systemic, infrastructural, behavioral, and regulatory factors that collectively create conditions of sustained risk for children. Rapid urbanization, insufficient investment in pedestrian-friendly infrastructure, unsafe school transport practices, and weak enforcement of traffic regulations have produced an urban environment in which children are routinely exposed to preventable hazards in their everyday mobility.

The study identifies several high-risk groups, including child pedestrians, children traveling on motorcycles, school van users, and children playing on streets and service roads. Unsafe driving practices such as speeding, reckless overtaking, underage motorcycle driving, and the negligent operation of heavy vehicles further intensify these risks. The findings also highlight gaps in road traffic injury data, limiting the ability of institutions to accurately assess patterns, design targeted interventions, and formulate policies.

A key implication of these findings is that current responses, which often prioritize awareness-raising and individual behavior change, may be insufficient to address the broader nature of the problem. While awareness campaigns remain important, the findings suggest that structural conditions such as unsafe road design, lack of designated school zones, overcrowded school transport, and inconsistent traffic law enforcement contribute significantly to child road safety risks. Without greater attention to these underlying issues, behavioral interventions alone may have limited impact in reducing child injuries and fatalities over the long term.

The study therefore highlights the importance of integrated, system-level interventions that place child safety more centrally within urban planning and transport governance. Strengthening

pedestrian infrastructure, improving regulation of school transport systems, enhancing institutional coordination, developing better data systems, and improving enforcement of traffic laws may contribute to reducing preventable injuries and fatalities. The findings also suggest that child road safety should be approached not only as a public health concern, but also as a broader issue of urban governance and child protection requiring sustained policy attention and multi-sectoral coordination.

8. RECOMMENDATIONS

At the policy level, greater attention may be needed to develop child-focused road safety measures that recognize children as a vulnerable group within urban transport systems. This could include improved enforcement of existing traffic regulations related to speeding, reckless driving, underage motorcycle riding, and the unsafe operation of heavy vehicles such as dumpers, trailers, and water tankers. There is also a need to strengthen regulations related to school transport, particularly to address overcrowding and improve minimum safety standards for school vans. Basic road safety orientation and training for school van drivers may also help promote safer transport practices, with support from schools, road safety organizations, and relevant institutions.

At the infrastructure level, improvements in pedestrian facilities such as sidewalks, safe crossings, and traffic-calming measures may help reduce children's exposure to road traffic risks, particularly around schools and densely populated residential areas. Measures such as speed reduction zones, warning signs, speed bumps, and safer road design could be considered in identified high-risk areas. The development of safe recreational spaces within communities may also help reduce the practice of children playing on streets and service roads.

At the institutional level, improved coordination among police, hospitals, rescue services, local authorities, and transport-related agencies may contribute to better reporting and understanding of child road traffic injuries. Developing more integrated data systems could support evidence-informed planning and targeted interventions. Additional monitoring of private school transport operators may also help improve compliance with child safety practices, including safer pick-up and

drop-off arrangements. International development partners, institutional donors, and United Nations agencies may also play a supportive role through technical assistance, research support, awareness initiatives, and capacity-building efforts related to child road safety.

At the community and school level, awareness and education initiatives may help improve understanding of safe road use among children, parents, caregivers, and drivers. These efforts could focus on issues such as underage

motorcycle driving, unsafe road crossing, and the risks associated with children playing in traffic-prone areas. Schools and community organizations may also help encourage safer transport practices and child supervision through regular awareness sessions and driver training activities.

REFERENCES¹

¹ The complete list of references and citations has been omitted from this version of the report and will be provided in the final peer-reviewed publication of the study.