THE BURDEN OF ROAD TRAFFIC INJURIES IN JORDAN: EVIDENCE FOR POLICY

DISCUSSION PAPER

JUNE 2024

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Health, Nutrition and Population (HNP) Discussion Paper

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Health, Nutrition and Population (HNP) Discussion Paper

The Burden of Road Traffic Injuries in Jordan: *Evidence for Policy*

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Abstract: Road traffic injuries (RTIs) are a critical public health issue in Jordan, as highlighted in the 2022 Annual Report on Road Traffic Injuries. With 169,409 crashes recorded, resulting in 562 deaths and a range of injuries, RTIs have emerged as the leading cause of death for children and young people, and the second-leading cause for adults aged 20–64. This study aims to understand RTI-induced disabilities in Jordan, identify contributing factors, and assess the associated costs for patients.

Employing a mixed-methods approach, the research included quantitative and qualitative data collection through hospital-based surveillance and follow-up surveys at one- and three-months post-injury. Six hospitals across Jordan participated, including both public and private institutions. Key informant interviews with stakeholders from various sectors were conducted to gain comprehensive insights.

The study's findings reveal that most RTI patients were male (79%) with an average age of 34 years. Crashes predominantly occurred during early mornings and night hours on main roads, involving mainly cars (72%) and motorcycles/bicycles (40%). A significant number of patients (74%) received prehospital care, primarily from ambulance staff. Most patients (66%) were fully conscious upon arrival at the emergency room.

Injury analysis showed that 58% of patients had a single injury, with extremities being the most affected area. Common treatments included sutures and surgical operations, with internal fixation for fractures being prevalent. Financially, 49% of patients incurred immediate costs upon hospital admission, and follow-up care also resulted in out-of-pocket expenses, particularly for physiotherapy and medications.

Disability outcomes indicated that 79% of patients experienced some disability at the one-month follow-up, with varying degrees from mild to extreme. By the third month, 73% reported no disability, though 26% continued to experience mild impairments. This study underscores the significant burden of RTIs in Jordan, highlighting the need for targeted interventions to reduce injuries and support affected individuals.

Keywords: Road traffic Injuries, Disability scores, patient journey, economic burden, Jordan

Disclaimer: The findings, interpretations and conclusions expressed in the paper are entirely those of the authors, and do not represent the views of the World Bank, its Executive Directors, or the countries they represent.

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Acknowledgments

This paper is part of a global effort to understand road traffic injuries (RTIs) and gain insights on contributing factors, resulting disability and associated healthcare costs. Findings would particularly guide Jordan in shaping evidence-based policies and interventions, adding to the shared knowledge pool for the development of effective prevention and road traffic mitigation strategies. This work is a concerted effort between the Ministry of Health in Jordan, the World Bank Group- Global Road Safety Facility (GRSF) and Health, Nutrition and Population (HNP) Department, UK Aid and IQVIA as implementing partner.

This paper was prepared by a team from the Ministry of Health led by Dr. Imad Fawzi Abu Yaqeen, Director of Hospitals Department, in collaboration with Al Bashir Hospital, Princess Basma Hospital, Ma'an Governmental Hospital, Mafraq Government Hospital, Jordan Hospital, Zarqa Governmental Hospital, and Salt Governmental Hospital. The IQVIA team was led by Dr. Rania Bader and composed of Dr. Tripti Bajaj and Lana Sunna. The World Bank team was led by Dr. Sameh El-Saharty and composed of Dr. Diya Elfadel, Dr. Takahiro Kasumi, and Said Dahdah.

The authors would like to express their gratitude to the participating hospitals and their staff for their dedication and continuous support in facilitating data collection, which was vital.

The authors would also like to acknowledge the Ministry of Transport, Public Security Department, insurance companies, and administrative focal points at the hospitals, as well as the trauma physicians and nurses, for their significant contributions of the findings for this study.

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The authors are grateful to the World Bank for publishing this report as an HNP Discussion Paper.

Executive Summary

Executive Summary

Study Scope and Objectives

According to Jordan's *2022 Annual Report on Road Traffic Injuries*, a total of 169,409 crashes occurred; 11,510 of the crashes resulted in road traffic injuries (RTIs) leading to 562 deaths and 805 severe injuries, 6,739 moderate injuries, and 9,552 mild injuries mostly occurring in Amman (41.7 percent), the mortality due to RTI has increased by 1.9 percent over the past five years. RTIs are the leading cause of deaths for children (5–14 years old) and young people (15–19). It is also the second-leading cause of death among population aged 20–64 years.

This research project aims to understand road traffic crash–induced disability in Jordan, examine contributing factors to the injuries and their severity, and explore the costs paid by the patient related to RTIs. The study will further draw relationships between accident-related attributes, sociodemographic characteristics and arising injuries—for instance, determine whether there are more disabilities among motorcycle crash victims than for car occupants. The analyses of the data will not only provide a broader understanding on the type of disability from the road traffic, but it will also inform decision-making and advocacy, and guide future policy actions.

Methodology

The study adopted a mix-methods approach including quantitative and qualitative methods to meet the study objectives. These encompassed a prospective hospital-based surveillance, and one-month and three-month follow-up surveys conducted with RTI patients. Key informant interviews were conducted with key stakeholders in the RTIs' landscape in Jordan. Six public and private hospitals were onboarded in the study for data collection from all three regions in Jordan. Hospitals included Al Bashir Hospital, Princess Basma Hospital, Ma'an Governmental Hospital (dropped halfway through the study), Mafraq Government Hospital, Jordan Hospital (private), Zarqa Governmental Hospital, Salt Governmental Hospital. IQVIA conducted 13 key informant interviews with key stakeholders such as the Public Security Department, Ministry of Transport, Ministry of Health, insurance companies (National Insurance Company, Euro Arab insurance Group), hospital administrators, and Emergency Room (ER) physicians and nurses.

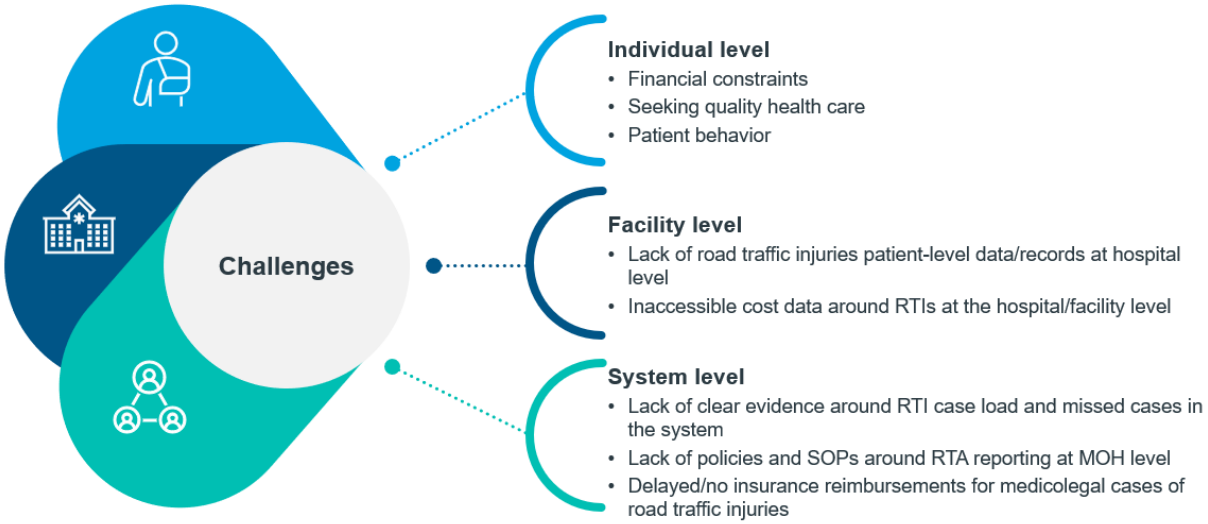
IQVIA recruited 47 RTI patients and conducted 34 first-month follow-up surveys in addition to 26 third-month follow-up surveys. The number of recruited RTI patients in the study was limited due to the low number of admissions for RTI cases in the selected hospitals in the required timelines. Hence, the study presents an indicative picture of the burden of RTI in Jordan based on this sample.

Study Findings

- **Demographics:** Respondents were mostly males and accounted for 79 percent of patients. The average age of RTI patients was 34 years, and they belonged to the age group of 18–44 years.
- **Crash characteristics:** As per study findings, most crashes occurred during the early morning hours and night on the main roads. Most of the vehicles involved in the crashes were cars (72 percent), followed by 11% tucks and lorries. The majority of crash patients were not using any safety equipment such as seatbelts and helmets, highlighting behavior change requirements in the community.
- **Prehospital care:** Among respondents, 74 percent received care at the scene of the accident, while rest of patients did not receive any care at the scene. In most cases, care was provided by ambulance staff (54 percent) and in some cases by bystanders (34 percent). Wound care was the most common service received by the patients at the scene, followed by fracture immobilization provided by the ambulance staff.

- **Patient condition at arrival to the ER:** Most patients (66 percent) scored highest on the Glasgow Come Scale (GCS) indicating that the patient was fully awake and responsive at the time of arrival in the ER. While the rest of the patients lost consciousness because of their RTIs at the scene of the crash.
- **Injury characteristics and treatment availed at the hospital:** The majority of RTI patients recruited for the study (58 percent) exhibited only one injury; 31 percent suffered from two injuries, while 11 percent had three injuries. The most common injury among the most severe injuries were located at the "extremities." The most common treatments provided were sutures/stitches (25 percent), followed by surgical operations (23 percent). Among the patients who underwent operations, the procedure primarily involved internal fixation for fractures.
- **Medical care expenses during hospitalization:** In the hospital survey, 49 percent of patients made a payment upon their arrival. Among paying patients, 60 percent paid an amount ranging from JD 40-60. Among the patients who disclosed information on total hospitalization costs, 51 percent of costs ranged from JD 0 - 300; 25 percent paid in the range of JD 301–600, and the rest paid JD 901 and more. Among patients, 46 percent indicated that their expenses were covered through the legal process, while 38 percent confirmed that they personally covered the costs from their own funds; 13 percent relied on assistance from friends and family, borrowing money to settle their hospital bills.
- **Follow-up care and patient expenses:** All respondents stated that they had paid for follow-up medical care out-of-pocket. Among patients, 73.5 percent incurred financial expenses for the one-month follow-up and 23 percent during the third-month follow-up. Expenses in the first one-month follow-up were for general practitioners (GPs) or clinic, physiotherapy, polyclinic visits, medicines, and lab tests, while during the third month it was mostly physiotherapy and medicines. On average, the patient paid JD134 during the first-month follow-up and JD 11 during the third-month follow-up.
- **Disability outcomes:** During follow-up surveys, 79 percent of patients said they were experiencing some form of disability at the one-month follow-up. During the first 30 days after discharge, 3 percent of patients stated extreme disability, 21 percent stated they suffered from severe disability, 35 percent moderate disability, 21 percent indicated they suffered from mild disability, and 21 percent suffered no disability due to the road traffic accident. During the third-month follow-up, 73 percent of respondents stated they had faced no disability or impairment in the past 30 days, while 26 percent stated they faced mild disability since the last interview. The overall disability is calculated based on six indicators: cognition, mobility, life activities, participation in society, getting along with people, and self-care.

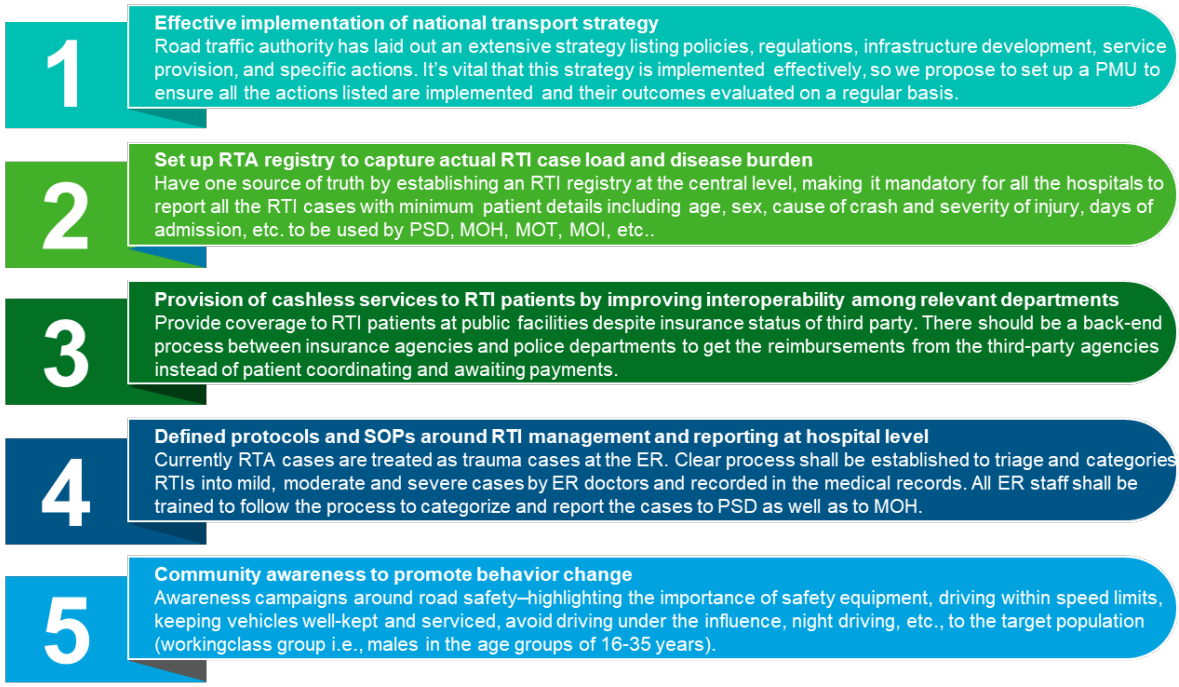
Figure 1 - Key challenges



Source: Findings from the assessment of the burden of road traffic injuries in Jordan

Notes: RTI= Road traffic injuries; SOPs = Standard operating procedures; RTA = Road traffic accident; MOH = Ministry of Health

Figure 2 - Recommendations for policies and interventions



Source: Findings from the assessment of the burden of road traffic injuries in Jordan

Notes: RTI = Road traffic injury; SOPs = Standard operating procedures; RTA = Road traffic accident; MOH = Ministry of Health; PMU = Project Management Unit; PSD = Public Security Directorate; MOT = Ministry of Transport; MOI = Ministry of Interior; ER = Emergency Room.

SECTION 1: Introduction

1. Introduction

This research project is part of a global effort to understand road traffic injuries (RTIs) and gain insights on contributing factors, resulting disabilities, and associated health care costs. Findings would particularly guide the country of Jordan in shaping evidence-based policies and interventions, adding to the shared knowledge pool for the development of effective prevention and road traffic mitigation strategies. This work is a concerted effort between the World Bank Group – Global Road Safety Facility (GRSF), the George Washington University Milken Institute School of Public Health (GWSPH), and IQVIA as the implementing partner.

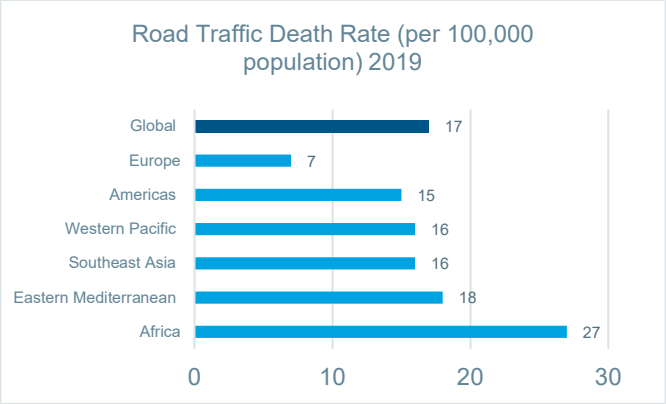
1.1. Background

Global RTI Context

The global burden of road traffic Injuries is significant, ranking as the eighth-leading cause of death worldwide based on World Health Organization (WHO) latest estimates. These Injuries claim over 1.35 million lives annually and result in up to 50 million injuries.[1] Despite efforts, the global death rate has remained relatively stable at about 18 deaths per 100,000 population over the past decade, with the East Mediterranean region holding a comparable rate (Figure 3).[2] Low- and middle-income countries (LMICs) bear the brunt of this burden, accounting for 90 percent of the fatalities despite having only half the vehicles.[3] Road safety was a key focus during the UN Decade of Action for Road Safety (2011–2020).

In addition to the immense human losses and suffering, road traffic injuries result in all sorts of economic costs. This socioeconomic burden has been estimated at 3 percent of the gross domestic product (GDP). Consequently, reducing the number of injuries will result in large cost savings and will make scarce medical resources available for treatment of other disabilities or diseases. Information on health care cost impact is important to encourage policy, particularly in the field of health care, to prioritize efforts on reducing road traffic injuries.

Figure 3: Road Traffic Death Rate



Source: World Health Organization

The extent and impact of disability resulting from road traffic crashes, especially in developing countries like LMICs, remain a topic of debate due to limited data. This data gap is critical, affecting costs, human capital, quality of life, and global advocacy efforts. Thus, an improved understanding of this underlying loss is of value. The global yearly injury rate and disability adjusted life-years lost due to crashes (via the Global Burden of Disease [GBD] team) has helped establish road crashes as an immediate and long-term drain on low- and middle-income countries. However, gaps remain in the country and in global knowledge regarding the extent of road crash–generated disability and follow-up information on those discharged with disabilities. Societal barriers such as transport accessibility, wheelchair access on footpaths, and the like are known compounders of disability but also poorly quantified.

[1] WHO (World Health Organization), 2019, https://www.who.int/data/gho/data/indicators/indicator-details/GHO/estimated-road-traffic-death-rate-(per-100-000-population).
[2] WHO, 2019, https://www.who.int/data/gho/data/indicators/indicator-details/GHO/estimated-road-traffic-death-rate-(per-100-000-population).
[3] WHO, 2022, Road traffic injuries (who.int).

Jordan Road Traffic Health and Economic Burden

Jordan is an emerging upper-middle-income country of approximately 11.0 million population[4] (Department of Statistics), including more than 1.4 million Syrian refugees.[5] The total number of RTIs in 2022 was 17,658, leading to 563 deaths and 7,544 moderate to severe injuries mostly occurring in Amman (34 percent).[6] Jordan's road traffic injury mortality rate, as per 2019 WHO data, has been decreasing, reaching 17 per 100,000 population, slightly below the regional rate. However, national road safety laws are being enforced at varying degrees.

According to the Global Burden of Disease (GBD) data, 656 life years per 100,000 people are affected in Jordan due to disabilities from road crash injuries, and it is the leading cause of deaths for children (5–14 years) and young people (15–19 years). It is also the second-leading cause of deaths among the population aged 20–64 years. Deaths and moderate to severe injuries are predominantly among males (73 percent), with similar distribution of road users among this severity group—passengers are 35 percent, pedestrians 33 percent, and drivers 32 percent. The financial cost of traffic crashes reached JD 322 million in 2022, according to the annual report issued by the Jordan Traffic Institute.

Jordan Health Care Context

The health care system in Jordan comprises the public and private sectors. Public sector providers include the Ministry of Health; the Royal Medical Services (RMS); and university hospitals, providing tertiary care. There are a total of 121 hospitals with a distribution of 71 private hospitals, 33 public hospitals, 15 military hospitals (operated by RMS), and 2 university hospitals[7] with the public sector accounting for the greater proportion of beds (63 percent).[8] In addition, humanitarian agencies like the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) provide health care to more than 1.1 million refugees through their clinics.

The Jordan Emergency Medical Service, managed by the civil defense, offers prehospital care through trained emergency medical technicians (EMTs) and paramedics. To activate the ambulance service, individuals can call 911, or 114 for sign language users.[9] Upon receiving the call, the Operations Room verifies the incident, dispatches the nearest civil defense unit, and achieves an average response time of 8.8 minutes (from 2015 data[10]). First aid is administered, and the injured are transferred to the nearest emergency department of a hospital while their vital signs are monitored. A report on their condition is issued, and the incident is documented and certified by the director at the civil defense Operations Room. Hospitals' emergency care units are the main channel for treating RTI injuries in Jordan.

Primary, secondary, and some tertiary health care services are accessible to all registered refugees of various nationalities in Jordan at the noninsured Jordanian rate through public health centers and governmental hospitals. These governmental health services are accessible across all governorates via public health care centers and governmental hospitals, and individuals can locate nearby services by consulting their neighbors.

For receipt of services at the noninsured Jordanian rate, patients are required to present a valid United Nations High Commissioner for Refugees (UNHCR) Asylum Seeker Certificate for all refugees and a

[4] Department of Statistics. https://dosweb.dos.gov.jo/
[5] L. H. Nazer, and H. Tuffaha. 2017. "Health Care and Pharmacy Practice in Jordan." *The Canadian Journal of Hospital Pharmacy* 70 (2): 150.
[6] *Jordan Annual Report on Road Traffic Accidents*, 2022.
[7] Jordan Private Hospitals Association: PHA (phajordan.org).
[8] *Annual Statistics Book*, MOH, 2019.
[9] Public Security Directorate, 2021, https://psd.gov.jo/en-us/civil-defense/services/asking-for-ambulance-case/.
[10] Goverment e-portal.
https://portal.jordan.gov.jo/wps/portal/Home/GovernmentEntities/Ministries/MinistryServiceDetails_en/ministry%20of%20interior/public%20security%20directorate/services/esaaf?lang=en

service card issued by the Ministry of Interior for Syrian refugees. In cases where patients are unable to obtain the noninsured Jordanian rate for necessary treatment at public health centers and governmental hospitals due to an invalid UNHCR Asylum Seeker Certificate that has expired within less than a month or in the case of an invalid service card for Syrian refugees, UNHCR can cover the treatment costs through Caritas clinics on an exceptional basis as defined by UNHCR.

1.2. Study Objectives

This research project aims to understand road traffic crash–induced disability in Jordan, examine contributing factors to the injuries produced and their severity, and explore the costs paid by the patient related to RTIs. The study will further draw relationships between accident-related attributes, sociodemographic characteristics, and arising injuries—for instance, determine whether there are more disabilities among motorcycle crash victims than among car occupants. The analyses of data will not only provide a broader understanding on the types of disabilities from road traffic, but it will also inform decision-making and advocacy, and guide future policy actions. The specific initial objectives of this work are as follows:

- Estimate the level of disability occurring from traffic crashes in Jordan
- Identify critical factors that influence their occurrence relative to deaths and nondisabling injuries
- Develop recommendations for advocacy actions and policies to reduce disability and burden to society in the long term
- Estimate costs associated with RTIs

SECTION 2: Study Methodology

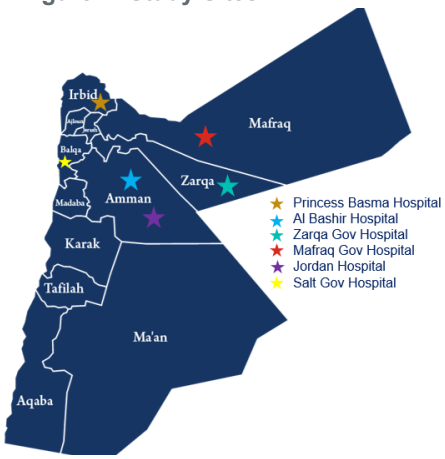
2. Study Methodology

This study adopted a mix-methods approach including quantitative and qualitative methods to meet the study objectives. These encompassed a prospective hospital-based surveillance, one-month and three-month follow-up surveys conducted with RTI patients, and key informant interviews (KIIs) with stakeholders in the RTIs landscape in Jordan. To ensure a comprehensive view of RTIs' management in Jordan, amidst a scarcity of information, fieldwork was complemented with secondary and extensive literature review, including previous census, health surveys, and academic studies on the subject.

2.1. Study Sites

At the start of the study, three Ministry of Health (MOH) hospitals providing emergency and trauma care to road traffic patients and treatment related to associated complications and disability were selected for primary data collection. Hospitals selected were Al Bashir Hospital located in the Central Region, Princess Basma Hospital in the North Region, and Ma'an Governmental Hospital in the South Region. These are major governmental hospitals in the country—with Al Bashir Hospital being the largest (1,550 beds)—and offered a wider representation since they are strategically located across the three regions of the country. This selection was approved by both the Ministry of Health and the World Bank.

Figure 4: Study Sites



Source: Based on study sites approved by the World Bank

During the course of study, low admissions rate for RTI cases was observed leading to low patient recruitment in the study. As a midcourse correction, Jordan Hospital (private) was added to the study, increasing the number of hospitals to four. Ma'an Governmental Hospital was replaced with Mafraq Governmental Hospital to improve patient recruitment in the study. As of November 27, two additional hospitals have been added to the list, Al Zarqa New Governmental Hospital and Al Salt Governmental Hospital, taking the total number of hospitals for patient recruitment to six.

2.2. Patient Recruitment Criteria

The study population included **adult RTI patients (***ages 18 years and above)* of either gender admitted to the hospital for at least 24 hours as a result of a road traffic injury. The injury needed to be severe enough to require hospitalization for *at least one day*, and individuals must be able to give consent and complete questionnaires or have a proxy who could give consent on their behalf during their unconscious time.

2.3. Sample Size

The study aimed to reach a sample size up to **300 patients** in the hospital survey and include as many patients as possible in the follow-up survey. The required sample was determined by the World Bank team. However, during the study it was discovered that the admission rate of patients with RTI in the selected hospitals was much lower than expected, and we reached the **sample size of 47** for the hospital survey as of January 28, 2024. Thirteen key informant interviews were done with key stakeholders to understand the RTI prevention and management landscape. Selected stakeholders are listed in the table below.

Table 1: Key Informant Interviews—List of Detailed KII in Appendix C

Stakeholder	KIIs
Ministry of Health	2
Ministry of Transport	1
Insurance companies	2
Hospital administrators	3
Trauma care medical providers (physicians/nurses)	4
Public Security Department	1
Total	**13**

Source:

Note: KII = Key informant interviews.

2.4. Ethical Approvals

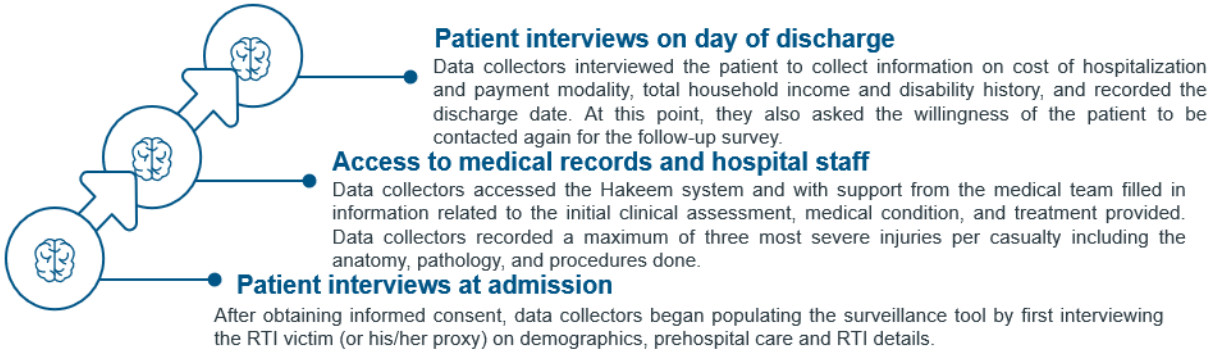
All necessary ethical approvals from relevant authorities, including the MoH and hospital management were obtained prior to the start of data collection. The Ministry of Health provided an official letter of Institutional Review Board (IRB) approval that was obtained from Al Bashir Hospital, and then shared with GRSF of the World Bank. Furthermore, patients were approached for their consent to participate in the study once their urgent care needs were met, both at the hospital site and for further follow-up after their discharge. Key informant interviews were also initiated by signing of an informed consent by all study participants.

2.5. Data Collection Procedures

Data collection was initiated on June 6 and was completed on January 28. Data are being collected by two field researchers and one supervisor, along with support from hospital staff monitored by the IQVIA country team.

Hospital surveillance and patient recruitment: Data collectors at each hospital recruited eligible patients at two points: upon arrival at the ER and at discharge from any other hospital department, to capture patients who were transferred in from other facilities and/or bypassed the Emergency Department. After medical personnel provided urgent clinical care and indicated the patient was stable, data collectors approached the patient for consent to participate in the study. Surveys were administered in paper format, and information in the survey instrument was filled out from various sources including patient interviews and medical records in the following sequence:

Figure 5: Patient Recruitment and Survey



Source: Based on the study methodology

Note: RTI; Road traffic Injury.

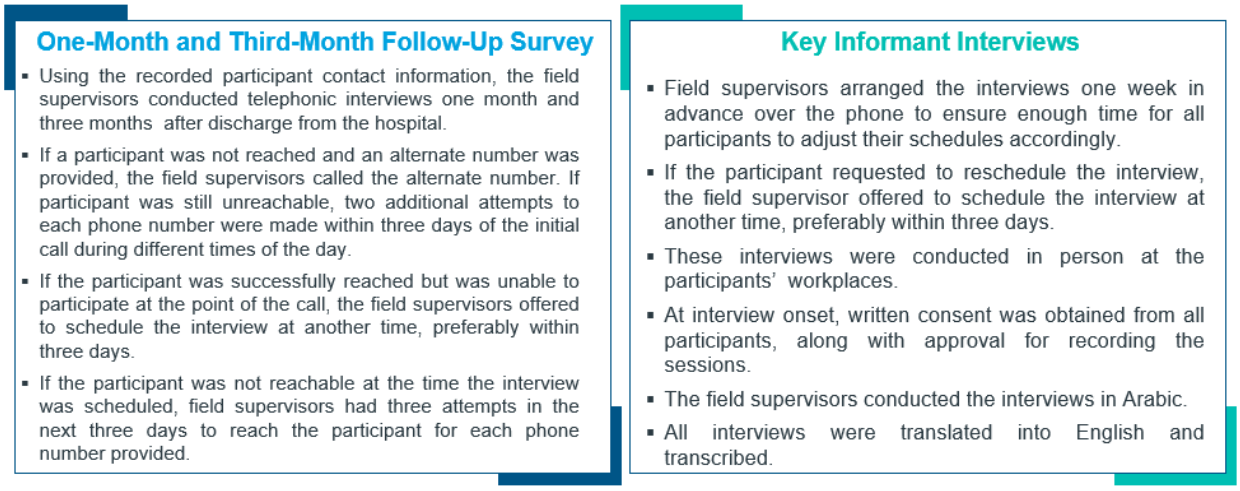
Once completed, the data collector entered the surveys digitally on Survey Solutions— the online platform adopted in the study—to ensure accurate data entry and reduce potential errors or recall bias.

2.6. Finalization of Data Collection Instrument

Study tools used during the study were developed by the Technical Assistance Team from the George Washington University Milken Institute School of Public Health (GWSPH) and the World Bank team, for the previous road traffic accidents (RTA) studies in the region. IQVIA reviewed, contextualized, and translated the tools into Arabic to fit the Jordanian context, in consultation with GWSPH and the World Bank, and shared these with the MoH for review before implementing the study. The study used the following types of tools:

Hospital surveillance tool (Appendix 1): Collects primary data at hospital sites on RTI patient's demographics, prehospital care, road traffic crash characteristics, initial clinical assessment, treatment, and associated costs incurred by the injured. Patients are to be recruited at admission to the Emergency Department or from other relevant hospital units.

Figure 6: First-Month and Third-Month Follow-Up and KIIs



Source: Based on the study methodology
Note: KIIs = Key informants interviews.

The disability follow-up protocol (Appendix 2): Survey protocol administered over phone at one month and three months after discharge from the hospital to capture the resulting disability. The follow-up survey is based on the International Classification of Functioning, Disability and Health (ICF).[11] This study considers a health condition to be an RTI, and measures level of functioning for RTI victims with moderate to severe disabilities by focusing on two ICF levels of functioning: their activity limitations and participation restrictions.

This **first-month follow-up survey** consisted of three modules:

- Module A: Short form of the validated instrument World Health Organization Disability Assessment Survey II (WHO DAS 2.0) includes questions on six domains: understanding and communicating, getting around, self-care, getting along with people, life activities, and participation in society.
- Module B includes questions pertaining to returning to normal life and work, as well as questions about assistive devices.

[11] WHO. 2002. "Towards a Common Language for Functioning, Disability, and Health: ICF." The International Classification of Functioning, Disability and Health. https://www.who.int/classifications/icf/icfbeginnersguide.pdf. Accessed January 13, 2021.

- Module C: Follow-up medical costs.

Given that Module A is a validated instrument, we adopted the Arabic translation obtained from Dr. Aemal Akhtar, who followed the WHO translation protocol, that is, a translation and back-translation procedure. The country team made two minor word edits, in consultation with GWSPH, seen to be more accurate for this project, by referring to the original language of the English language questions.[12]

As for the **third-month follow-up**, we have used the disability protocol follow-up (Appendix 2), which pertains to data collected by phone three month after patient's discharge from the hospital to measure the burden of resulting disability. The follow-up survey consists of the following:

- Module A: WHO Disability Assessment Schedule II
- Module B: Assistive devices and return to usual activities
- Module C: Follow-up medical costs
- Module D: Craig Hospital Inventory of Environmental Factors—includes questions aimed at quantifying the degree to which elements of the physical, social, and policy environment act as barriers to participation

Disability scoring

Questions are scored on a five-point Likert scale as follows:
0 = No difficulty
1 = Mild difficulty
2 = Moderate difficulty
3 = Severe difficulty
4 = Extreme difficulty or cannot do

- **Mild difficulty** means a problem that is present less than 25 percent of the time, with an intensity a person can tolerate, and that has happened rarely over the last 30 days.
- **Moderate difficulty** means a problem that is present less than 50 percent of the time, with an intensity that is interfering in the person's day-to-day life, and that has happened occasionally over the last 30 days.
- **Severe difficulty** means a problem that is present more than 50 percent of the time, with an intensity that is partially disrupting the person's day-to-day life, and that has happened frequently over the last 30 days.
- **Extreme difficulty** means a problem that is present more than 95 percent of the time, with an intensity that is totally disrupting the person's day-to day life, and that has happened every day over the last 30 days.

The total possible disability score range for each disability scale is as follows:

- No difficulty: 0–2
- Mild difficulty: 3–12
- Moderate difficulty: 13–24
- Severe difficulty: 25–36
- Extreme difficulty or cannot do: 37–48

Discussion guides for key informant interviews*:* Discussion guides were developed with two aims: First, to complement data retrieved from surveys with more comprehensive yearly data around RTIs, when present and accessible. Second, to enrich quantitative findings with qualitative information that is essential to unravel underlying causes and behaviors associated with RTIs and their management. Stakeholders

[12] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8517853/.

were selected based on their knowledge and the diverse roles they played in the RTI landscape in Jordan, such as trauma care providers, payers, policy makers, and road traffic authorities. IQVIA developed five different discussion guides with different lines of inquiries based on stakeholders. For further details on the discussion guides, please refer to Appendix 3

2.7. Training of Data Collectors

Training sessions were conducted with training of trainers for the field supervisors and data collectors, who then led the trainings at the hospital level for the hospital staff supporting data collection on all study protocols and tools. Training topics included patient identification and recruitment, consent, survey questionnaire, discussion guides, data entry, and reporting, to ensure standardization and quality of collected data across the different participating hospitals. During the month of June, IQVIA conducted several training sessions and mock interviews for hospital staff on the survey tools. In addition, IQVIA held multiple training sessions in June and November for the field supervisors on the survey tools, follow-up questionnaire, and informant discussion guides. These sessions were facilitated using training materials created by GWSP. For further details on trainings conducted, please refer to Appendix 3.

2.8. Pretesting of tools

The hospital survey tool was pretested on five patients; the scoping exercise on discussion guides used for KIIs was done with hospital administrators, to check the applicability of questions and availability of data. Pretesting was done to ensure accuracy of local translations, flow of the questions, availability of information, relevance, or digital functionality. Any issues encountered were taken into account in the finalization of the survey tools and guides.

2.9. Data Quality Checks

Spot-checks: An IQVIA officer supervising fieldwork accompanied the data collectors every day during the first week of collection, then conducted spot-checks on a biweekly basis or when needed to ensure quality of data collection and proper implementation of study protocols. Data collectors shared daily updates on progress, tracking sheet, and challenges encountered in the field. Accordingly, the study teams attended to arising issues and opportunities to increase patient participation.

Data quality checks: Key metrics and variables were checked in the data to ensure their quality. IQVIA regularly reviewed uploaded surveys on the online platform Survey Solutions for accuracy, completeness, and proper identification of patients, that is, whenever a survey got uploaded. The data analyst extracted and cleaned the data for incomplete entries, duplications, and missing values, ensuring proper coding of variables. Arising issues or inconsistencies were attended to by the field team and data collectors.

Data collection tracking sheets (Appendix C): To ensure careful follow-up with all study participants, data collectors maintained a paper-based and electronic (e.g., Excel sheet) data collection tracking sheet. The tracking sheet captured the patient's ID that had to match across the different tools, contact phone number(s), dates of admission to and discharge from hospital, and date of one-month follow-up survey. As such, the collector referred to it to identify patients who were due for follow-up and retrieved their contact information. The tracking sheet noted the status of the interview and reason for no follow-up, and was updated daily.

2.10. Data Storage

Finalized data collection tools were updated to Survey Solutions. Survey Solutions transmits data online over a network connected to World Bank headquarters. It allows the data collector to enter and upload data on the server. It also works offline, later synchronizing data once the network is available.

Survey Solutions defends collected data from unauthorized access, as the World Bank cloud is doubly secure. First, by relying on Amazon AWS, it provides best-in-class protection for even the most security-

sensitive organizations and their data. Second, on top of Amazon AWS's security protocols, the World Bank provides an additional layer of protection through its own security measures. Since no personal identifiers are entered in Survey Solutions, the field team maintains a logbook with patients' names and phone numbers and created unique identifiers against each case, which were entered in Survey Solutions and tracked for follow-ups. Entered data by a country were only to be accessed by the country team, the Global Road Safety Facility (GRSF) team at the World Bank, and the GWSPH team.

2.11. Data Management and Analysis

Data analysis was conducted as per the analysis plan developed by GWSPH. Basic descriptive analysis was run on hospital data to obtain details on the profile of patients, crash characteristics like frequent RTI road users and respected road safety measures, duration of stay, common types of injuries, treatments received, and payment fees. Similar analysis was conducted on follow-up surveys to estimate the disability score and attributes of patients corresponding to each disability level. Also, a thematic analysis was performed on key informant interviews to identify recurrent themes and concepts voiced.

Different sources of data were compared and contrasted; quantitative data retrieved from primary surveys were complemented with those from yearly reports, studies, and surveillance pieces shared by interviewed stakeholders. Added to qualitative insights captured from implementing this project, the literature and informants, this study was able to draw a holistic view on the subject outlining key findings and recommendations that inform future work and interventions.

2.12. Study challenges and limitations

During data collection, the field team noted very low RTI admissions to the selected hospitals meeting the eligibility criteria. During the duration of data collection from June 6 up to January 28, 2024, the majority of RTI cases coming to ER were of mild to moderate injury not requiring admission.

The total number of road traffic injury admissions recorded across Al Bashir and Princess Basma Hospitals, Mafraq Government Hospital, Zarqa New Governmental Hospital, Salt Governmental Hospital, and Jordan Hospital was 349. Of this figure, 30 cases declined consent, while 274 were deceased upon arrival or did not meet the study criteria, specifically falling into categories such as individuals under 18 years old or those admitted for less than 24 hours. Out of the total admissions, only 45 surveys were successfully completed. The observed challenges leading to the low patient recruitment rates are stated below:

1. **Staff-related**
    - Initial resistance from hospital staff to support the patient recruitment and data collection due to busy schedules and lack of incentives.
2. **Administrative challenges**
    - Numbers of RTI admissions shared by hospital management during the study design phase was vastly different and lower from the actual admission numbers observed during the data collection period.
    - Obtaining RTI data from hospitals (both public and private) or the Ministry of Health to support our mitigation process was challenging as there are no clear records of RTI admissions at the hospital level or MOH level.
    - Referred patients from public hospitals to private hospitals may not state that the patient is RTA. This might cause underreporting of cases from the private hospital.
3. **Patient-related**
    - A significant number of patients declined to give consent due to concerns regarding medico-legal implications and privacy issues. Many patients were hesitant to share details about the road traffic Injuries as they might be considered responsible for the incident, such as driving under the influence/speeding/not wearing a seatbelt, etc., fearing that the survey could be used against them

in the context of a medico-legal case, even though the data collectors explained that the data provided by the patient are private and anonymous and are only used for research purposes and the patient can skip any question; patients were not convinced to participate in the study.

- Majority of the patients requested early discharge or transfer after stabilization as they preferred to be treated at private hospital facilities since RTIs were covered by third party insurance, hence not meeting the 24-hour admission criteria required for patient recruitment in the study.
- In case of absence of third-party insurance, patients were reluctant to get admitted due to financial burden related to RTI cases not covered under regular insurance.
- The majority of admitted RTI cases do not fulfill the 24-hour admission criteria. Patients often leave the hospital against medical advice, either to seek admission at a different facility with a different injury cause for seeking insurance coverage, as injuries resulting from RTIs are considered medico-legal cases and not covered by insurance. In other instances, patients seek out private hospitals in search of higher-quality health care services. Financial constraints also play a significant role, with many patients unable to afford the hospital expenses, leading them to make the decision to leave.

Mitigation measures: IQVIA, the World Bank, and GWSPH discussed several mitigation measures to ease the recruitment challenges, such as extending the duration of data collection, provision of on-the-job support, additional trainings to hospital staff to recruit patients, daily follow-ups with hospital staff on RTI admissions, and multiple meetings with hospital leadership by World Bank leadership team and IQVIA team to find solutions. It was decided to add two new hospitals in the study with high RTI loads as per the recommendations from MOH: Jordan Hospital (private) and Mafraq Governmental Hospital (replacement of Ma'an Hospital, which was dropped due to no RTI admissions in over two months). Study duration was also extended for two months to allow additional time for data collection. However, due to the extremely low admission rate and consent refusals, the sample size still remains low.

SECTION 3: Secondary Research Findings

3. Secondary Research and Key Informant Interview Findings

3.1. Trends and Patterns in RTAs Over the Years

According to Jordan's *2022 Annual Report on Road Traffic Injuries*, a total of 169,409 crashes occurred, 11,510 of these resulted in RTIs leading to 562 deaths and 805 severe injuries, 6,739 moderate injuries, and 9,552 mild injuries mostly occurring in Amman (41.7 percent). WHO Global Health Observatory (GHO) 2019 statistics showed that the RTI mortality rate has been decreasing for the past couple of years, reaching 17 per 100,000 population, which is slightly lower than the regional rate.

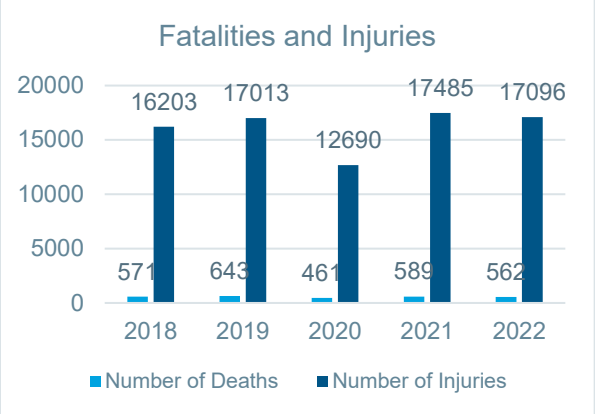
Jordan's *2021 Annual Report on Road Traffic Injuries* categorize injuries based on the definitions below:

- **Fatal injury (Death)** is an injury that typically results in death either directly or due to complications within one month of the injury occurring.
- **Minor injury** is an injury that does not disable the injured person from carrying out their daily activities and does not result in the disability of any body part. It fully recovers within a period ranging from 24 hours to not exceeding a week.
- **Moderate injury** is an injury that may disable the injured person from carrying out their daily activities and work for more than 24 hours. It causes the temporary disability of a body part with the return of the body part to full function without any disability within a period not exceeding 21 days and may require hospitalization for more than a day.
- **Severe injury** is an injury that disables the injured person from carrying out their daily activities and work, causing the temporary disability of a body part. The body part may or may not return to its full function completely during a period exceeding 21 days. It may leave a permanent or temporary disability and can be serious.

Based on the data provided in the *2022 Annual Report on Road Traffic Injuries*, there is a fluctuating trend in the number of human injury incidents (Any incident in which at least one moving vehicle caused human injuries, collision, runover, overturning) over the five-year period from 2018 to 2022. In 2018, there were 10,431 incidents, which increased slightly to 10,857 in 2019. However, in 2020, there was a notable decrease to 8,451 incidents. The trend reversed in 2021, with an increase to 11,241 incidents, followed by a further increase to 11,510 incidents in 2022.

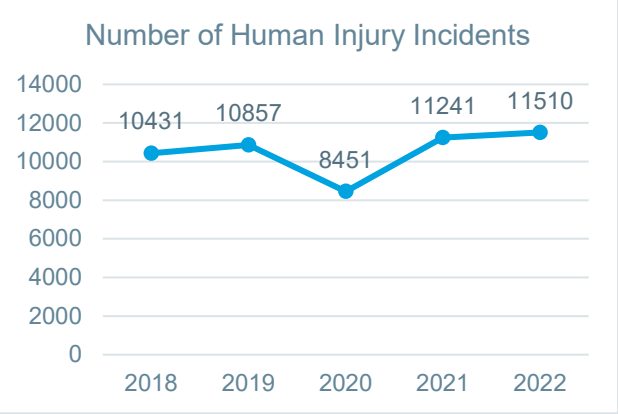
Based on the five-year trend for fatalities and injuries, there was an initial increase in fatalities from 571 in 2018 to 643 in 2019. This was followed by a significant decrease to 461 in 2020. The number of deaths increased slightly in 2021 to 589 before decreasing again to 562 in 2022.

Figure 7: Fatalities and Injuries



Source: 2022 Annual Report on Road Traffic Injuries

Figure 8: Number of Human Injury Incidents



Source: 2022 Annual Report on Road Traffic Injuries

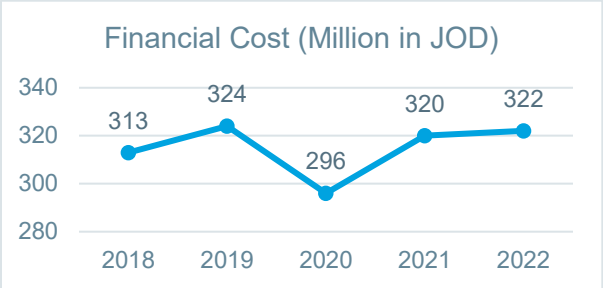
The number of injuries increased from 16,203 in 2018 to 17,013 in 2019. There was a significant decrease to 12,690 in 2020, which might have been caused by COVID-19 movement restrictions and lockdowns. This was followed by an increase to 17,485 in 2021 and a slight decrease to 17,096 in 2022. These numbers are collected, maintained, and reported by the Public Security Directorate (PSD) in Jordan. They work closely with the Ministry of Health and the Ministry of Transport responsible for providing prehospital and hospital care to RTA patients.

> The designated authoritative institutions for collecting road traffic accident data are the Public Security Directorate and the Traffic Department. Whenever there is a need for specific data pertaining to RTAs at the Ministry, we initiate an official correspondence with the PSD, clearly articulating the precise data requirements
>
> **Ministry of Transport - Director of the Directorate of Planning and Studies**

> Based on the world record we are within the range; I think it's around 5.2. As for the trend for the past 5 years I saw that there is an increase in RTA cases, however for this year there is a decrease, even though we have a higher number of cars, more construction work
>
> **Ministry of Health – Hospital Management Representative**

The financial cost was 313 million JD in 2018, which increased slightly to 324 million JD in 2019.There was a decrease in the financial cost to 296 million JD in 2020. The cost increased again to 320 million JD in 2021 before experiencing a slight increase to 322 million JD in 2022. The annual increase in the cost of traffic accidents has reached 0.9 percent over the past five years. The PSD is currently utilizing an undisclosed equation to calculate the financial cost or burden of RTAs. Determinants include (1) the cost of police work, (2) the cost of insurance, (3) mild cases, (4) moderate cases, (5) severe cases, and (6) death cases.

Figure 9: Financial Cost (RTA)



Source: 2022 Annual Report on Road Traffic Injuries

Between 2021 and 2022 the number of human injury incidents (any incident in which at least one moving vehicle caused human injuries, collision, runover, overturning) increased by 2.4 percent; fatalities decreased by 4.5 percent; injuries (RTA) decreased by 2.2 percent; and financial cost increased by 0.7 percent.

These trends can be linked to two main factors, the increase in population by 2.3 percent from 2021 to 2022, and the increase in numbers of vehicles by 3.4 percent from 2021 to 2022. The temporal index of human injury incidents during 2022 is illustrated in the figure below.

Figure 10: Temporal Index of RTA (2022)

Source: 2022 Annual Report on Road Traffic Injuries

3.2. National Transport Strategy in Jordan

The project aims to support the revision and update of the existing National Transport Strategy and an accompanying Action Plan in Jordan. Jordan's Long-Term Strategy for the transport sector is a comprehensive blueprint that outlines both short-term objectives for 2024 and long-term objectives for 2030. Its multifaceted approach encompasses policies, regulations, infrastructure development, service provision, and specific actions within various segments of the transport sector. These segments include road, railways, civil aviation, port and maritime operations, public transport, and freight transport and logistics. The strategy delineates a meticulous implementation plan for each subsector, outlining distinct phases of development alongside the corresponding budget requirements. In the long run, the strategy aims to advocate for the adoption of energy-efficient and sustainable transport solutions, such as the integration of hybrid or electric vehicles. Notably, the strategy emphasizes environmental considerations, including the monitoring and assessment of reduced carbon dioxide (CO_2) emissions within the transport sector as a crucial metric for successful implementation.

Priority areas for the design of the safety measures: young drivers, impaired driving, speeding, vulnerable road users (pedestrian in particular), motorcyclists, and road infrastructure. Measures included in the National Transport Safety Program are national legislation, police enforcement, awareness campaigns and educational programs, training and driving licenses, vehicle safety, road infrastructure, postcrash medical care, statistics and monitoring, and other accompanying measures.

> We consistently endeavor to enhance road safety standards and measures. This commitment to road safety has been prominently incorporated into the newly established strategic objectives outlined in the Transportation Strategy for the years 2023 to 2027. These objectives encompass a comprehensive approach aimed at reducing traffic accidents, mitigating their associated risks, and minimizing their physical and societal consequences.
>
> **Ministry of Transport - Director of the Directorate of Planning and Studies**

The National Transport Strategy for 2024–2028 mentioned different challenges and recommendations for road safety as per below. This report was published in January 2024.

Challenges for road safety include the following:

- Inadequate attention to fatalities from road traffic crashes
- Absence of a singular authoritative entity for planning a comprehensive road safety strategy
- Problematic driver behaviors
- Lack of quality safety standards for vehicle registrations
- Absence of mandatory road safety training for trolley, truck, and public transport drivers before obtaining a driver's license
- Failure to include the youth segment in road safety decision-making

Recommendations for road safety include the following:

- Establishment of an independent leading entity dedicated to directing national efforts on roads, reporting directly to the Office of the Prime Minister, with sufficient staff, budget, and alignment with the implementation of secure road safety systems. Responsibilities of the leading entity are not limited to providing necessary recommendations to reduce fatalities and accidents, but also to the following:
    - Develop and implement national legislation and regulations related to road safety
    - Design and execute awareness campaigns and educational programs
    - Conduct training courses, certify drivers, making it a prerequisite for obtaining driving licenses
    - Incorporate safety standards in vehicle type certification and individual vehicle registrations
    - Enforce safety designs in road infrastructure and conduct detailed audits before approving road designs
- Focus on building administrative capacities, establishing multisector partnerships, and enhancing youth and women's participation in decision-making.

- Develop national road safety strategies, plans, and goals supported by comprehensive data and research to enable a more holistic assessment of various aspects related to road safety.
- Organize training workshops for all land transport drivers to enhance their skills, improve service quality, and promote road safety, with a specific emphasis on driver behavior.
- Enforce legal texts in the driver's license system under traffic laws, requiring all public transport drivers to obtain an annual driving permit and attend specialized training courses, including those related to road safety and driver behavior, as a fundamental condition for obtaining a driving permit.
- Reference safety regulations and emissions to reduce the size of fleets and, simultaneously, enhance their safety and reduce emissions.
- Include provisions to increase safety in maritime and air transport, along with proposals to enhance safety for rail transport when it becomes operable again.
- Full compliance with international standards, such as those of the European Union, where available and feasible before implementation.

3.3. Legislation and Regulations

The Jordanian government has intensified financial and administrative penalties for traffic violations, especially for using a mobile phone while driving, running red lights, and exceeding the speed limit. The cabinet, approved an amended Traffic Law for the year 2023, granting the authority to impound a vehicle for a period ranging from 24 hours to 30 days depending on the violation's severity and type. It also empowered the Director of Public Security to impound a vehicle for a specified two-week period based on the nature of the violations.

> Many of the recommendations proposed in the amended traffic law, which came into effect on the 12th of September, were derived from the strategy of the Ministry of Transport, developed in collaboration with the World Bank. Some of these recommendations included stricter penalties for speeding violations, mandatory seatbelt usage, and child safety seats in vehicles, all of which can reduce the occurrence and severity of accidents.
>
> **Ministry of Transport - Director of the Directorate of Planning and Studies**

Regarding the penalties, stricter measures were taken for repeat offenses, including using a mobile phone while driving, with the fine now being JD 50 (approximately US$70) instead of JD 15 (approximately US$21). Running a red light now carries a penalty of imprisonment for one to two months and a fine ranging from 200 (US$280) to JD 300 (US$420), with the penalty doubling for repeat offenses within the same year. Violations by public transport drivers for smoking while driving as well as for allowing passengers to smoke in the vehicle incur a fine of JD 10 (about US$15.4).

Driving at high speeds, more than 50 kilometers/hour (km/h) above the speed limit now results in imprisonment for one to three months and a fine of JD100 (about US$140), with the fine doubling for repeat offenses within the same year. The amendments also address processions on roads during celebrations, increasing the fine for this violation to a range of JD 50 - 100 (US$70 to US$140), up from the previous JD 30 (US$42). Additionally, the law grants members of the General Security Council the authority to conduct alcohol and drug tests when a driver is detained.

Under this law, the Ministry of Interior and the Public Security Directorate have the authority to suspend a license for reasons related to false documents or data, an intentional crash resulting in death or disability, or driving under the influence of drugs, in addition to not issuing licenses due to serious violations like driving without a license. According to the proposed law, personal rights cannot be waived by the court for violations involving driving under the influence of drugs or alcohol, driving without a license, or using an unqualified license to drive another vehicle. Furthermore, the court must ensure that fines do not fall below the specified amount, do not exceed the maximum limit, do not go below the minimum limit for mitigating circumstances, and do not merge financial penalties.

3.4. Prehospital Care and Emergency Response

Prehospital care, care provided at the scene of injury and prompt delivery to emergency units at hospitals are time-sensitive aspects critical to mitigating the severity of RTIs. In low-income countries, twice as many people die before reaching a hospital than in high-income countries[13] (WHO 2018). As such, bystanders play a pivotal role in activating the ambulance system by dialing emergency phone numbers and providing basic interventions if trained, before professional medical help becomes available. In turn, it is important that emergency care units at hospitals staff health care providers who have focused training in delivering emergency care, be properly equipped, and employ standard protocols to treat injuries, especially as timely care could mean saving a life.

Jordan offers an Accidental and Emergency Medicine Specialty, an organized residency program that lasts four years. Apprentices who apply to this course are eligible to be emergency medical specialists. In terms of health-seeking behaviors, a study evaluating patient experiences in private and governmental hospitals, including waiting time, doctors' and nurses' care, environment, and other domains, revealed that patients perceived quality of care to be superior in private hospitals compared to public ones[14] (Al-Kalaldeh 2022). There remains limited knowledge in the country on clinical data related to RTIs, as Jordan lacks a trauma registry that collects systematic hospital-based data on injury epidemiology, clinical interventions, disability levels, and health outcomes that guide efforts to address care gaps.[15]

3.5. Insurance Regulations for RTAs

In accordance with Jordanian law, any injuries resulting from road traffic Injury are classified as medico-legal cases. The Public Security Directorate (accident representative), upon arrival at the crash site, will notify the hospital of the need to transfer the patient via ambulance for treatment as a result of a road traffic crash. Alternatively, if the patient arrives at the hospital independently (not via ambulance), they declare that their injuries are from an RTA. Consequently, such cases do not fall under the umbrella of Ministry of Health insurance coverage, requiring patients to cover the expenses themselves or seek compensation from the party at fault, as documented in the crash report prepared by the accident representative at the scene.

> We pay monthly from 1,200,000 to 1,500,000 compensation because of traffic accidents and what is higher than 250,000 for accident victims and their treatment coverage
>
> **Insurance company representative**

Following a road crash, both parties involved undergo hardships, whether resulting in bodily harm or vehicle damage. The absence of established procedures between hospitals and insurance companies concerning the acknowledgment of accident-related injuries contributes to confusion, particularly for financially disadvantaged crash-causers unable to afford the requisite insurance for the treatment of the injured at hospitals. Even if the responsible party arranges payment for the treatment of the injured, insurance companies often delay coverage until they acquire a definitive medical report, potentially prolonging the process for several months.

> Insurance coverage includes all types of medical services up to the limit allowed by the insurance system which is 7,500 JOD
>
> **Insurance company representative**

<u>Regulation of Compulsory Insurance No. 12 of 2010</u>

Issued by the Board of the Insurance Authority based on the provisions of Paragraph A of Article 9 and Article 19 of the Compulsory Vehicle Insurance Law No. 12 of 2010:

[13] *WHO Global Status Report on Road Safety*, 2018.
[14] *Healthcare Service Quality: Comparing Public and Private Hospitals in Jordan. Al-Kalaldeh, 2022*
[15] *WHO Global Status Report on Road Safety*, 2018.

A- The insurance company is obligated to pay the lump sums listed below to the affected person in the cases delineated in Table 2 below.

Table 2: Insurance Companies' Payment Obligation for Damages

Type of damage	The lump sum that the insurance company is obligated to pay
Death	JD 17,000 per person to be paid to the legal heirs
Permanent total disability	JD 17,000 per person
Permanent partial disability	JD 17,000 multiplied by disability percentage, per person
Temporary disability	JD 100 per week for a maximum of 39 weeks, per person
Moral damage resulting from death	JD 3,000 per person paid to the legal heirs up to the second degree
Moral damage resulting from permanent total disability	JD 3,000 per person
Moral damage resulting from permanent partial disability	JD 3,000 multiplied by disability percentage, per person

B- The limits of the insurance company's liability in compensation for medical treatment expenses, loss, and damage to property shall be determined according to the types of damage delineated in Table 3.

Table 3: Limitation of Liability of Insurance Companies

Type of damage	Limitation of liability of the insurance company
Medical treatment expenses	A maximum of JD 7,500 per person
Loss and damage to property including: 1- Material damage allowance 2- Loss of Benefit Allowance 3- Instead of value decreases	A maximum of JD 75,000 per accident

3.6. Key Behaviors Risking Road Traffic Injuries

Over half fatalities resulting from road traffic incidents include vulnerable road users such as pedestrians, cyclists, and motorcyclists. Worldwide, pedestrians and cyclists account for 26 percent of fatalities, while users of motorized two- and three-wheelers contribute to an additional 28 percent[16] (WHO 2018). Car occupants represent 29 percent of total fatalities.

Stated Reasons for RTI Globally

Key user behaviors risking road traffic injuries include speed, drunk-driving, limited motorcycle helmet and seat belt use, and mobile phone use while driving. It is observed that speed influences severity of injuries where a 1 percent increase in mean speed is generally correlated with a 3 percent increase in serious car incidence (WHO 2018). Moreover, head injuries are the main cause of severe RTIs among motor vehicle users, and wearing helmets reduces the risk of head injuries by 69 percent. Similarly, seatbelts reduce death risk to front and rear seaters by 45 percent and 25 percent, respectively. In addition, distracted driving through mobile use is common among young drivers, it slows reaction time, and hence results in a multifold increase in crash incidents. Information on road traffic injuries details in a country provide valuable

[16] *WHO Global Status Report on Road Safety*, 2018.

insights for evaluating the impact of laws and their implementation, or the absence thereof, on safety standards. Such evaluation helps direct policy action.

Stated Reasons for RTI in Jordan

According to Jordan's *2022 Annual Report on Road Traffic Injuries*, traffic accidents are predominantly caused by human factors, contributing to 98.8 percent of incidents, whereas road-related issues accounted for 0.4 percent, and vehicle-related factors made up 0.8 percent. Injury accidents were classified into crash accidents (59.5 percent), run-over accidents (33.4 percent), and collapse accidents (7.1 percent).

Common driver errors leading to accidents included a lack of necessary precautions (40.3 percent) and disregarding lanes and priorities (34.2 percent). Tire defects were the primary vehicle-related issues (27.1 percent), while the absence of traffic controls (38.8 percent) constituted the majority of road defects causing human injuries. Clear weather conditions accounted for 95 percent of total deaths, with the highest fatalities occurring on roads with a speed limit of 60 km/h (25.1 percent), affecting pedestrians, drivers, and passengers.[17]

Road Users Injuries in Jordan

In terms of injuries, passengers were the most affected (38.3 percent), followed by drivers (36.3 percent) and pedestrians (25.4 percent). In Jordan, Pedestrian fatalities constituted the highest percentage of deaths (36.1 percent), followed by drivers (32.4 percent), and then passengers (31.5 percent).[18]

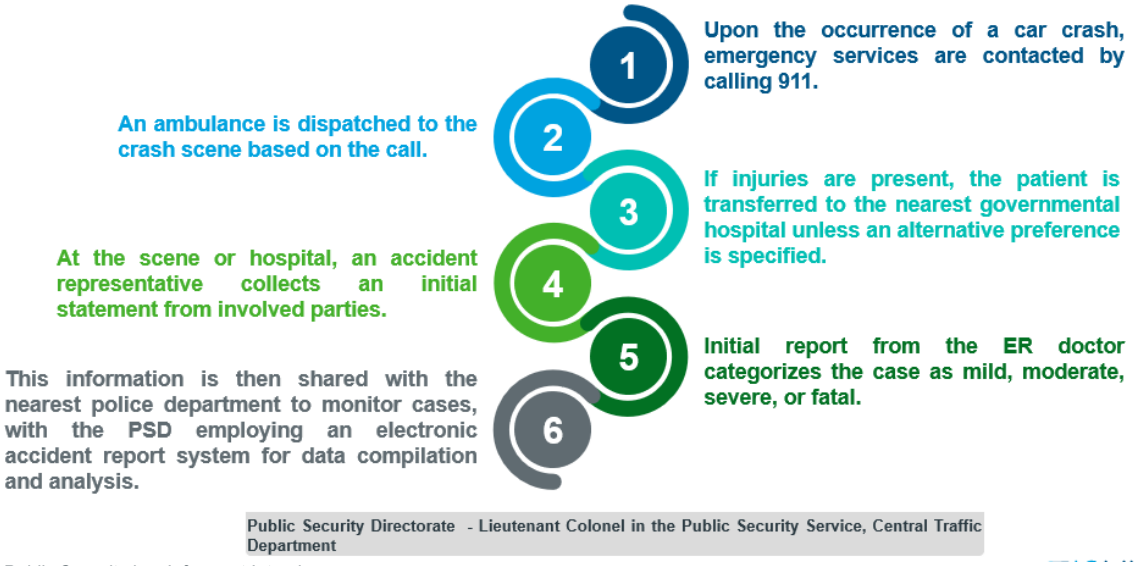
[17] *2022 Annual Report on Road Traffic Injuries* (Jordan), https://psd.gov.jo/media/jfopsjca/final-annual-report-2022-2.pdf.
[18] *2022 Annual Report on Road Traffic Injuries* (Jordan), https://psd.gov.jo/media/jfopsjca/final-annual-report-2022-2.pdf.

SECTION 4: Study Findings

4. Study Findings

4.1. **RTA Patient Journey—As Stated by Study Respondents during Qualitative Interviews** The ER at all hospitals functions as a comprehensive health care hub, managing daily influx of patients and relieving the workload on other hospital units. The figure below describes the processes followed by the Traffic Department from the car crash scene to data reporting.

Figure 11 - Process of traffic department from car crash to data reporting



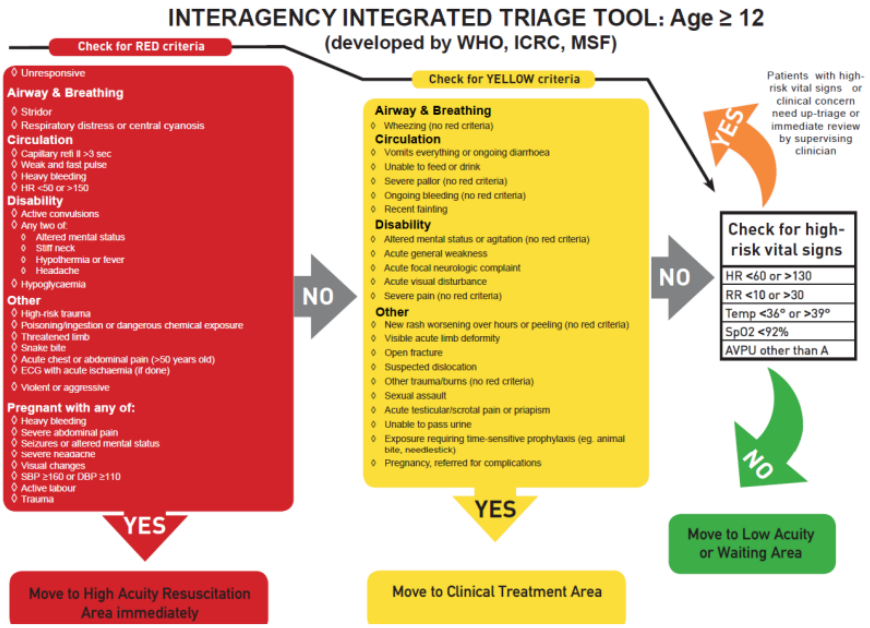
Source: Public Security key Informant Interview

Note: PSD= Public Security Directorate

Most patients are transported via ambulances to the ER and subsequently undergo a registration process. During the registration process, the patient gets registered through the Medical Records Department. The patient or the caregiver register the patient and provide all required information.

The triage process follows a specific protocol outlined by the Ministry of Health, depending on the severity of the injuries.

Figure 12: Interagency Integrated Triage Tool: Age ≥ 12



Source: World Health Organization, International Committee of the Red Cross, Médecins Sans Frontières

After initial triage, patients are classified by doctors and nurses into specific zones, including red, yellow, and green categories. Patients are transferred to different rooms, pediatric red area, internal medical red area, surgical red area, critical care red area, and trauma yellow area. Stable patients (green) are directed to the waiting room (Figure 9).

As per the doctor's instructions, each patient undergoes essential tests and procedures, including radiology and lab tests. The ER doctor can also request a specialized doctor to assess the case based on initial diagnosis. The doctor continues to monitor the patient's condition to determine whether hospital admission is necessary, considering the initial evaluation, diagnostic tests, and primary health care services provided.

Al Bashir Hospital, for instance, follows Advanced Trauma Life Support (ATLS) Guidelines. Physicians adhere to the ATLS protocol when managing injured patients in the emergency care unit and when transferring them to the relevant departments for further internal or surgical interventions, as necessary.

Image 1 - ER building at Al Bashir Hospital

Source: IQVIA, picture taken by field supervisor

The patient will need to take the doctor's order and stamp it at the Accounting Department, in which they are classified as "Capable Jordanian (financially sufficient)/Incapable Jordanian (financially disadvantaged)/non-Jordanian (refugees)" and categorized into emergency case or nonemergency admission. Some patients might be asked to pay for the initial payment as per the doctor's order if the case is not an emergency case. Patients who do not pay at registration are critical cases/emergency cases that are transported by an ambulance through the Public Security Directorate.

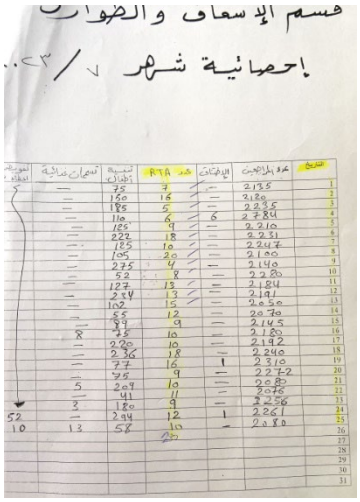
> "All cases of road traffic injuries are not covered by health insurance and the patient pays cash for all medical procedures in the hospital except in emergency cases, the hospital postpones payment until after the completion of treatment.
>
> **Al Bashir Hospital – Administrative representative**

Capable Jordanian: A Jordanian citizen who possesses the financial capability to cover their hospital expenses and is not listed in the governmental registry for individuals receiving financial aid or support from the government. These individuals typically hold steady employment and receive regular salaries.

Incapable Jordanian (financially disadvantaged): A Jordanian citizen officially registered in governmental records as a recipient of financial aid or support from the government due to financial constraints or other qualifying factors.

In the ER unit, a designated accident representative collects daily data on road traffic injuries. This includes recording the total number of injuries occurring each day and writing a medico-legal report. Upon the arrival of a patient classified under the code of RTA, the accident representative promptly takes notes and gets notified from the Public Security Directorate officer at the crash scene or from physicians or nurses; the accident representative then develops the medico-legal report and the initial report, which enables the patient to continue receiving treatment from the hospital as the patient is considered uninsured. If the patient is admitted, payments are done when the patient is discharged from the hospital and when legal action is concluded, for which the payment will be made by the person who caused the road crash. The person who caused the crash needs to take the medico-legal report, the final report from the doctor, and the invoices to the third-party insurance company (car insurance) so that person can be reimbursed, or financial matters remain on hold until they are concluded in the court sessions, and the final report from the physician is provided with an estimate on percentage of disability or damages.

Figure 13: RTA Monthly Report by Accident Representative



Source: IQVIA, picture taken by field supervisor

All the data are recorded on paper-based forms at the hospital by the accident representative for cases arriving at the hospital via ambulances. In case the patient walks in directly at the outpatient department to receive treatment and does not disclose RTA as part of medical history, the RTA cases may go unreported. All reports and statistics are then shared with the PSD/Traffic Department.

The PSD/Traffic Department has conveyed that they lack information regarding the categorization of cases based on hospitals since cases are reported to them without specific mention of the hospitals involved. They have clarified that any categorization available is typically found in the annual report, organized, for instance, by governorate rather than by individual hospitals. To obtain hospital-specific categorization data, it is suggested that such information may be procured from the Ministry of Justice. The Ministry of Justice receives all medico-legal cases, which are subsequently distributed to the courts nearest the location of the car crash. The PSD/Traffic Department receives data from all hospitals, aggregating these as cases rather than individual hospital reports. The PSD/Traffic Department has clarified that these data are comprehensive and encompass national information, capturing any accidents that occur.

4.2. Patient Recruitment

IQVIA as per the suggestion of World bank and MOH initially identified three hospitals receiving RTI cases for patient recruitment. Upon initiation of the study, it was discovered that RTI patient admission numbers are much lower than expected, leading to low sample size. To mitigate the issue, three more hospitals were added to improve recruitment numbers. Number of RTI cases brought to the hospital ER Department were tracked to understand the patient dropout rates and reasons for nonparticipation in the study. The figure below highlights total RTI cases brought to the ER, total cases admitted, cases admitted for more than 24 hours, minor cases, patients denied consent, and total recruited cases for the hospital survey and patients participating in the one-month and third-month follow-up surveys. This allowed us to understand clearly the reasons for low patient recruitment and admission rates.

Figure 14: Patient Recruitment Breakdown from Each Hospital

	Data collection start date: June 6-8, 2023			September 5, 2023	September 17, 2023	November 27, 2023	November 28, 2023
	Al Bashir Hospital	Princess Basma Hospital	Ma'an Hospital Dropped August 20, 2023	Jordan Hospital	Mafraq Hospital	Zarqa Hospital	Salt Hospital
Total RTA patients	2231	1977	57	1	75	93	150
RTA admissions	280	42	21	1	54	43	19
Patients not eligible < 18 years old	54	37 patients (< 18/ < 24 hrs.)	10 patients (< 18/ < 24 hrs.)	1	54	37 patients (< 18/ < 24 hrs.)	4
Patients not eligible < 24 hrs.	159			0			14
Patients not eligible arrived dead/died at the hospital	0	1	11	0	0	1	0
Patient refused consent/not willing	29	1	0	0	0	0	0
Patient provided consent	38	3	0	0	0	5	1
Patient recruited	38	3	0	0	0	5	1
Patient completed 1-month follow-up	31	3	0	0	0	0	0
Patient completed 3-month follow-up	23	3	0	0	0	0	0

Note: Al Salt Hospital started providing patient information on December 19, 2023 when the hospital received the facilitation letter from the Ministry of Health

Reasons for denied consent:

- Many patients declined to give consent, citing concerns about potential medico-legal implications and privacy issues.
- Patients hesitated to share specific details about their road traffic injury, fearing possible blame for the incidents, including factors like driving under the influence, speeding, or not using seatbelts.
- The survey's potential use in medico-legal cases led to patients' wariness despite reassurances from data collectors regarding the anonymity and research-only use of the provided information.
- Some patients, who were the cause of an accident resulting in a fatality, were surrounded by police officers for detention and subsequent transfer to jail once the case stabilized and discharge was feasible.
- Certain patients, particularly those of advanced age, declined participation in the study, expressing disinterest or an inability to comprehend the nature of the study, while some Intensive Care Unit (ICU) patients were declined participation by their proxies or caregivers due to the dangerous nature of their condition.

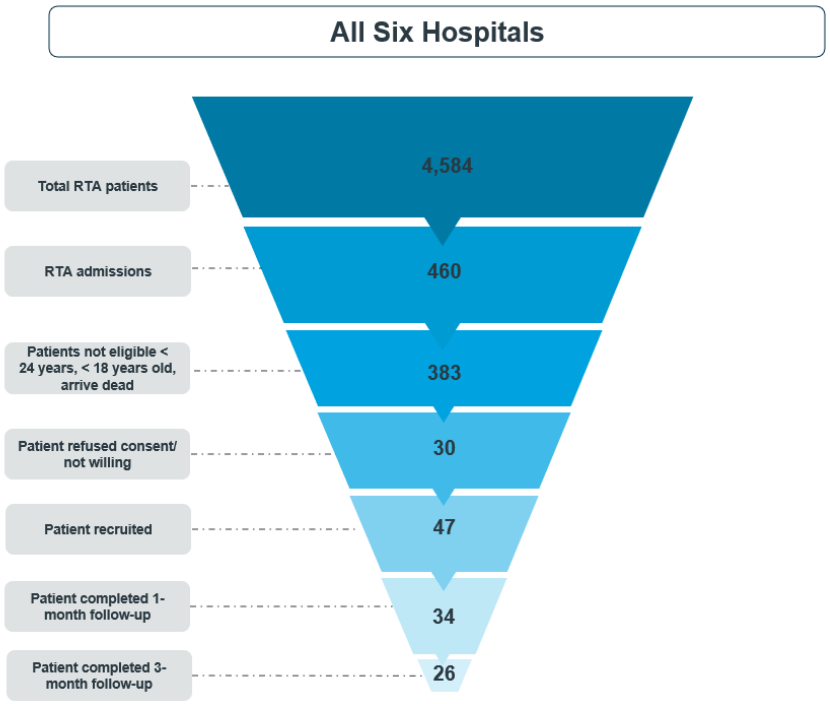
High proportion of arrived dead at Ma'an Hospital:

- Ma'an Hospital is located on the desert highway where the speed limit is 110 km/hr Given the high speed on that highway, very often the crashes and accidents there are deadly.

Low patient volume at Jordan Hospital (private hospital):

- The ambulance transports the patient to the closest public hospital from the crash scene, unless the patient requests another specific hospital. In addition, if a patient is transferred from a different hospital to Jordan Hospital, patient records/transfer records do not mention RTA specifically, but are recorded under "Trauma," hence, the RTA at the hospital is underreported. Moreover, accident representatives are only present at the public hospitals; therefore, it is difficult to keep track of RTA patients at the private hospitals unless patients are transferred directly from the crash scene to the hospital's ER Department.

Figure 15: Patient Recruitment from All Six Hospitals



As per the study, the number of RTA incidences are quite high, but admission numbers are only approximately 10 percent of total cases, and eligible cases with consent to be recruited are almost 1 percent of the total reported cases in the selected sites. To gather substantial data to run this study and get disability scores, the scope of study needs to be expanded to more sites with longer duration of data collection.

4.2.1. Sociodemographic profile of RTI patients

The following section highlights the profile of the respondents who participated in the study until January 28, by their gender, age, education, marital status, professional position, household members, type of health insurance, and annual income. Detailed information about respondents' demographics is presented below:

- **Gender:** Respondents were mostly males, accounting for 79.0 percent of patients. This is similar to the *2022 Annual Report on Road Traffic Injuries* in Jordan, where 73.4 percent of RTI patients were males.
- **Age/Age group**: The average age of RTI patients was 34 years; 77 percent belonged to the age group of 18–44 years. This is in line with the *2022 Annual Report*, where ages 18–35 accounted for the highest percentage of fatalities and moderate to severe injuries. The highest distribution among the age groups is 25–44 years, with 47 percent.

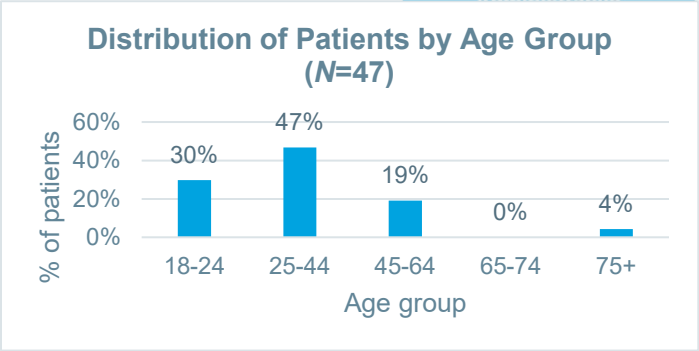
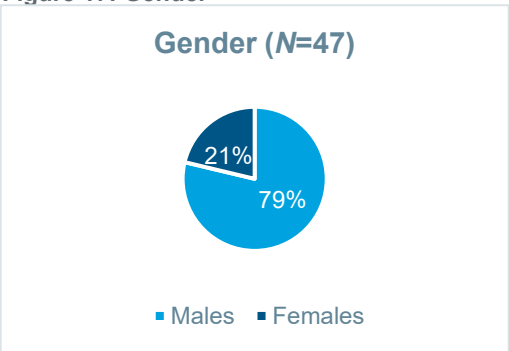


Figure 16: Age groups

Figure 17: Gender



- **Marital status:** 55 percent of patients were never married, while 36 percent are currently married, the rest of respondents are either widowed, divorced, or separated.
- **Education level:** 55 percent of respondents had a secondary/high school education (7–12 grades), and a lesser extent (21 percent) held a bachelor's degree.

Figure 18: Martial Status

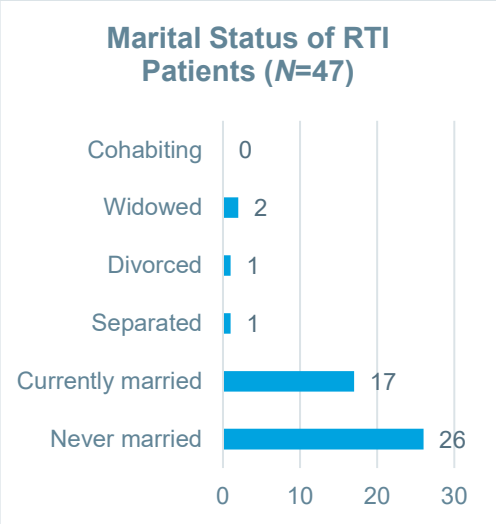
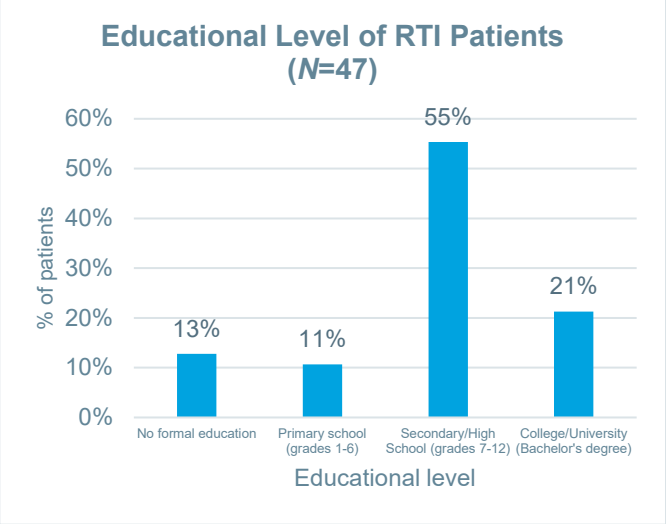


Figure 19: Educational Level



- **Employment status:** Among RTI patients, 34 percent are daily-wage laborers, while 32 percent are salaried workers. Other patients were either students, homemakers, unemployed, retired, or self-employed.
- **Number of persons in household:** It was observed that the majority of RTI patients' respondents lived in large households of six persons on average. Among respondents, 57 percent belonged to households of 4–7 members, and 28 percent were in households of 8 to 11 members, while only 9 percent live in households with fewer than three members.

Figure 20: Employment status

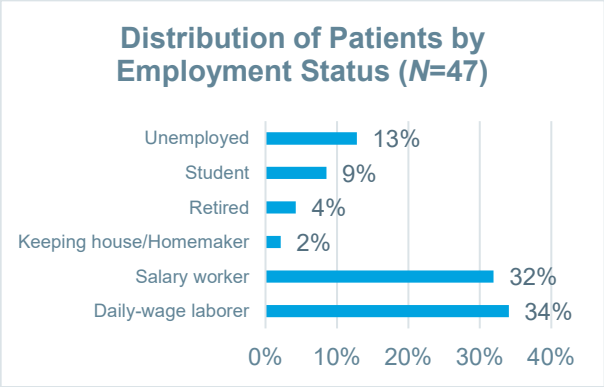
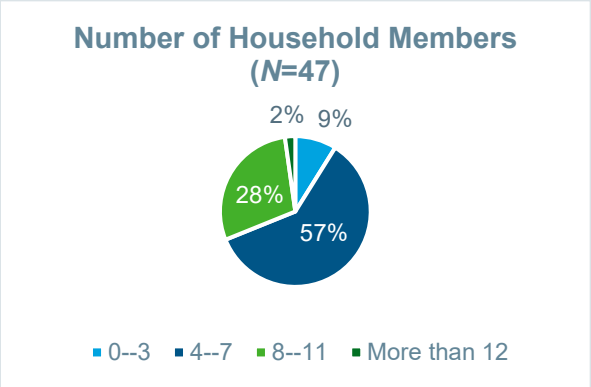


Figure 21: Household members



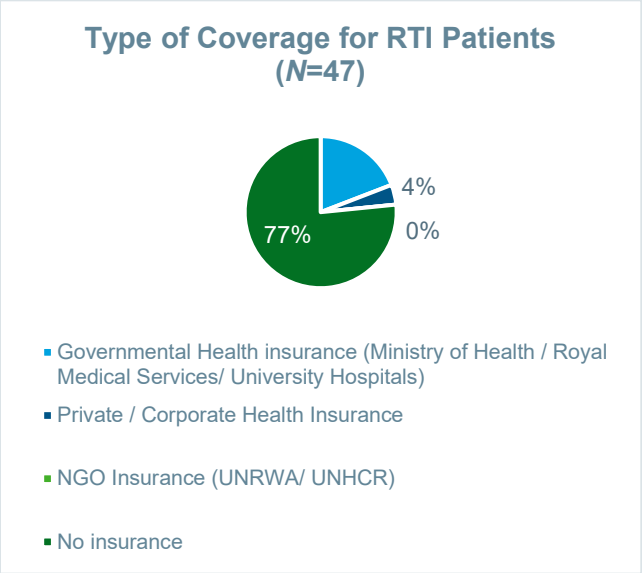
- **Annual income of household (JD):** Several patients were reluctant to disclosing information on their household income. Among those who responded, the majority of patients belonged to the low-income group. The annual income of 36 percent of respondents was more than JD 4,500. Among respondents, 21 percent stated their annual income was JD 3,001–4,500, while 18 percent were in the category of JD 1,501–3,000. Among respondents, 18 percent received an annual income maximum of JD 1,500 (JD 125 monthly), as illustrated in the table below. The low incomes can be further explained by the type of work that several patients engaged in, such as janitoring, delivery, and cab driving, since many of those who seek care at Al Bashir Hospital are of the lower socioeconomic levels.

Table 4: Annual Income of Household

Annual income (JD)	Number of RTI patients(*N*=39)	%
JD 0–1,500	7	18
JD 1,501–3,000	7	18
JD 3,001–4,500	10	21
More than JD 4,500	17	36

- **Type of coverage:** The majority of patients had no insurance (77 percent) while 19 percent had governmental insurance, and only 4 percent had private insurance. While patients are insured by different providers; RTA patients are considered medico-legal cases and are not covered by health insurance at the hospitals.

Figure 22: Insurance Coverage



Notes: NGO = Nongovernmental organization; UNRWA = United Nations Relief and Works Agency for Palestine Refugees in the Near East; UNHCR = United Nations High Commissioner for Refugees.

4.2.2. Crash characteristics

Findings in this section demonstrate the characteristics of the crash, time of the crash, the type of road where the incident occurred, the individual's role (pedestrian, driver, or passenger), the type of vehicle involved at the time of the injury, details regarding the other party, the presence of safety equipment, instances of mobile phone use or alcohol and substance use, and the factors contributing to the occurrence of the accident.

- **Time of injury:** Crashes resulting in RTI injuries for our respondent patients occurred during the day (5 am–3 pm) for 49 percent of the cases, while 36 percent occurred during the night (8 pm–5 am), while 16 percent of injuries occurred in the evening (3 pm–8 pm).
- **Type of road where accident occurred:** The majority of road crashes contributing to RTIs occurred on main roads (72 percent), whose average speed limits are usually between 60km/hr and 80 km/hr. This is in line with the Jordan 2022 Annual Report that also observed the most common speed reported for moderate to severe RTIs was 60 km/hr.

Figure 24: Time of Injury

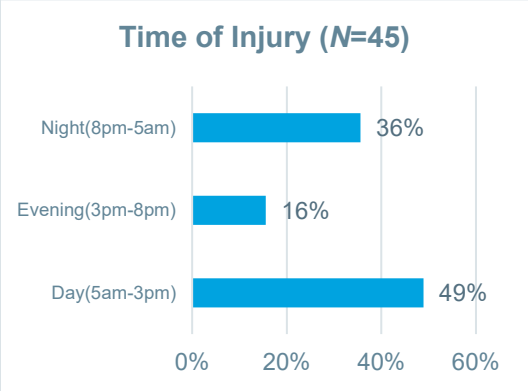
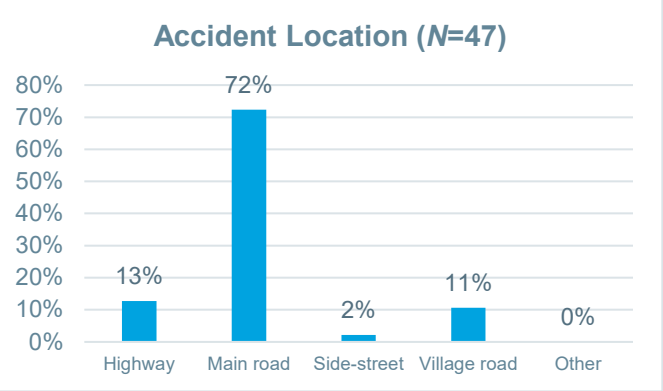


Figure 23: Crash Location



Main roads, whose average speed limits are usually between 60 km/hr and 80 km/hr. Main injuries were head and neck injuries and were dominant among crashes happening on different type of roads; these were followed by abdomen and extremities injuries. As for the village and highway roads, the most severe injuries occurred to the extremities.

Table 5: Cross-Tabulation—Road Type by Injury Site (Most Severe)

Road type	Head & Neck	Chest	Extremities	Abdomen	Face
Main road	11	1	8	9	4
Village road	0	1	4	0	0
Highway	0	1	4	1	0
Side street	0	0	1	0	0

- **Type of road user:** 43 percent of RTI patients were drivers of cars, motorcycles, or bicycles, followed by pedestrians (40 percent) who were crossing or walking on the side of the road, and passengers (17 percent).

Pedestrian results from the cross-tabulation below show the highest number of most severe injuries are in the extremities followed by abdomen, face, and head and neck. As for the drivers including the cyclists, head and neck was the dominant most severe injury, then the extremities, followed by abdomen, face, and chest. As for the passengers, data are scattered across different injury sites, extremities come at the top, followed by the head and neck and chest, then the abdomen and face.

Table 6: Cross-Tabulation—Road User Type by Injury Site (Most Severe)

Road user type	Head & Neck	Chest	Extremities	Abdomen	Face
Passenger	2	2	3	1	0
Driver (includes cyclists)	7	1	6	4	1
Pedestrian	2	0	8	6	3

- **Type of vehicle patient was traveling in:** The most common vehicle RTI patients were traveling in was cars (71 percent), while the rest used motorcycles, bicycles, buses, and trucks.

Figure 26: Type of RTI Patients Road Users

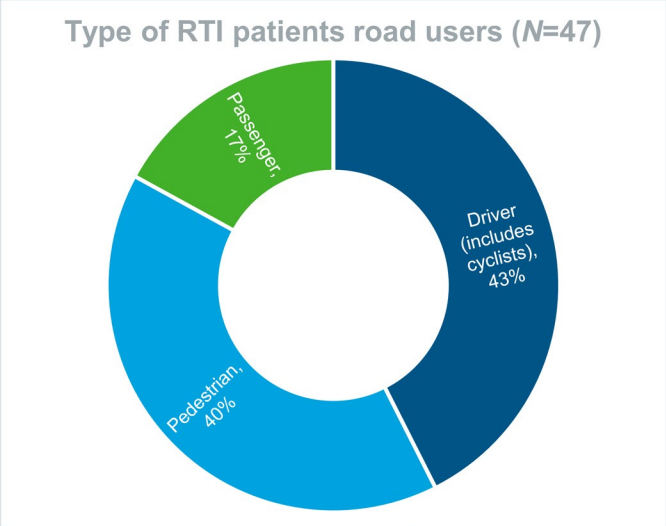
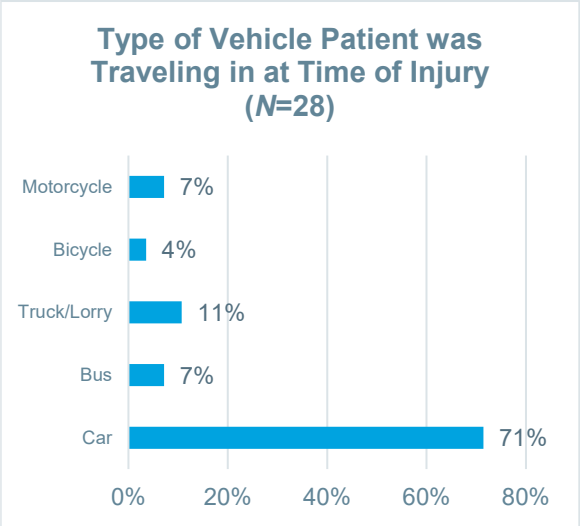
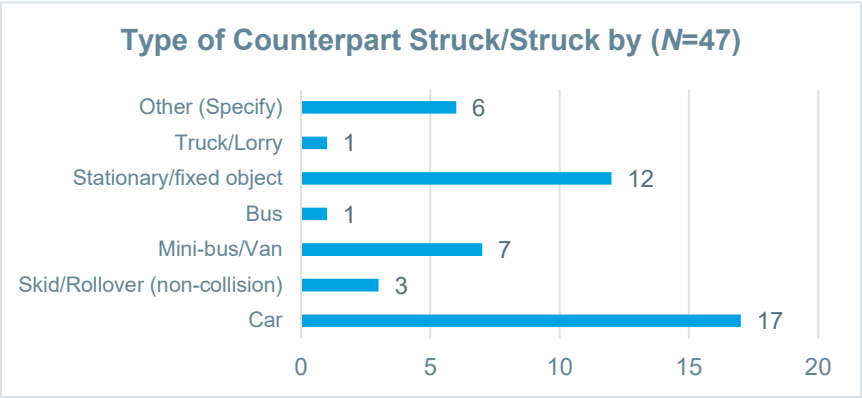


Figure 25: Type of Vehicle



- **Type of counterpart struck/struck by:** In 36 percent (17 responses) of the cases, the accident was equally likely to be with another car; and in 26 percent (12 responses), striking a stationary object. In 15 percent of the cases, the accident was with a minibus or a van. While others also mentioned the car overturned and bumps and potholes in the street.

Figure 27: Counterpart Type



- **Safety equipment used (nonpedestrians):** Among nonpedestrians, 67 percent were wearing no safety equipment, while 33 percent were using safety equipment. Out of 27 respondents who chose to answer this question, only 7 wore a seatbelt and 2 wore a helmet.

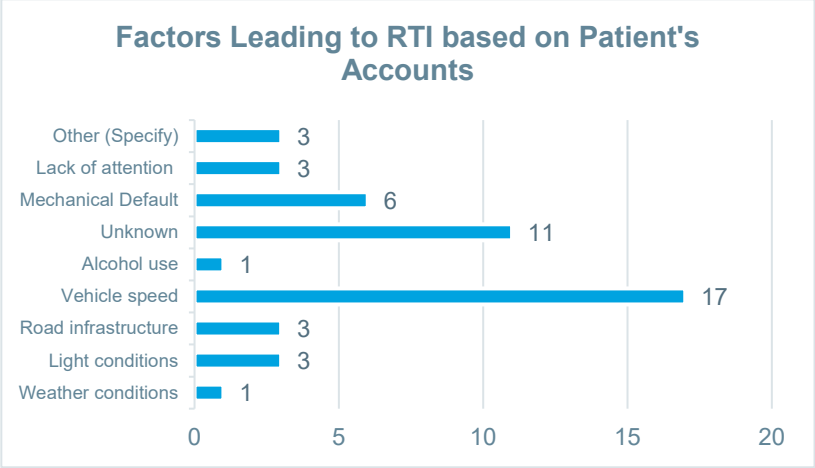
Key findings from cross-tabulation below show that RTI patients were more likely to suffer from disability during the first month of follow-up than patients who were wearing seatbelts or a helmet during the car crash.

Table 7: Cross-Tabulation—Safety Equipment by Disability Outcomes

Safety equipment	No impairment (0–2)	Mild disability (3–12)	Moderate (13–24)	Severe disability (25–36)	Extreme (37–48)
None	3	4	5	2	1
Seatbelt	1	1	3	1	0
Helmet	1	0	1	0	0

- **Mobile phone use (nonpassengers):** Only one pedestrian stated that they were using the mobile phone when the accident occurred.
- **Confirmed/Suspected alcohol/substance use within six hours of RTI:** One patient out of the 47 participants was suspected of alcohol or substance use within six hours of RTI. It is to be noted that most of the RTI patients suspected of alcohol abuse refused to participate in the study, due to medico-legal implications.
- **Factors leading to accident (based on patients' account):** Based on the RTI patients' account, the five most common reasons for the accident were the vehicle speed, mechanical defects (such as car brakes and mechanics not working), poor road infrastructure, lack of attention, light conditions, and unknown factors. Others included factors such as a dog crossing the road and car theft.

Figure 28: Factors Leading to RTI



4.2.3. *Prehospital care*

In this section, we describe prehospital care characteristics, such as what kind of care was provided at the scene of the injury, who provided the care, and what type of care was provided, in addition to the mode of travel to the hospital and time taken to reach the hospital.

- **Care provided at scene:** Thirty-five of the respondents received care at the scene of the accident, while 10 patients did not receive any care at the scene.
- **Who provided care:** Among cases who received prehospital care, this was provided either from bystanders (34 percent) or ambulance staff (54 percent). It was less common that a relative or friend provided the care.

- **Type of care provided:** Types of care provided varied between wound care, which was the highest, or fracture immobilization, wound care, control bleeding, and C-spine immobilization. Physical help to get out of the vehicle was included under the category of "other."

Figure 29: Care Provided at Scene

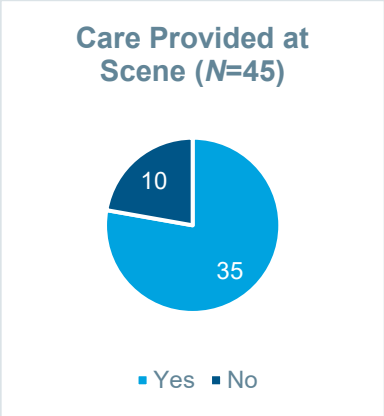


Figure 30: Person Providing Care

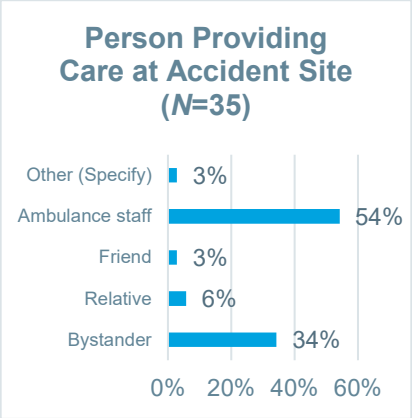
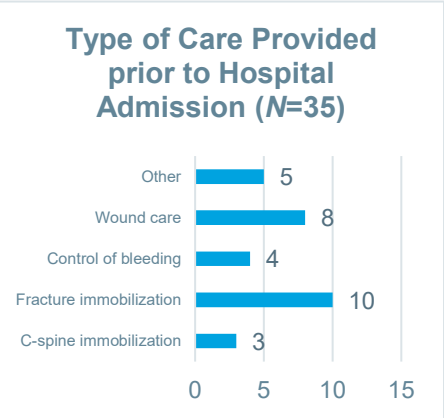
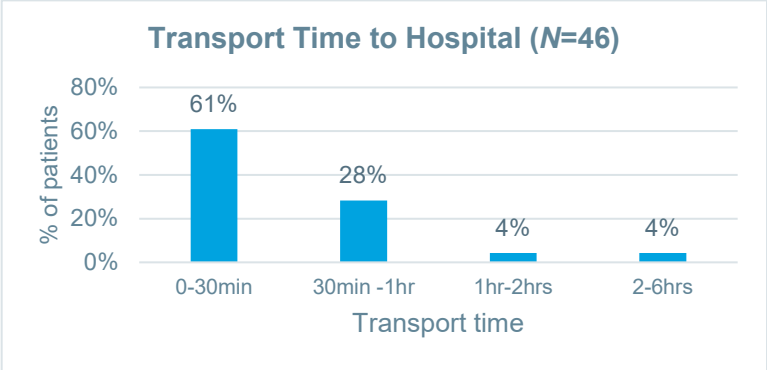


Figure 31: Type of Care



- **Mode of arrival to hospital:** All patients were transported by ambulance except three by car (*N*=47).
- **Transport time to hospital:** 61 percent of the cases were transported to the hospital in less than 30 minutes; 28 percent of them were transferred between 30 minutes and one hour. It was less likely that it took more than one hour of transport time to reach the hospital. Two patients were transferred from another hospital by an ambulance.

Figure 32: Transport Time to Hospital



4.2.4. Hospital care and treatment

In this section, the findings pertain to the initial vital signs recorded upon the patient's arrival at the hospital, including the Glasgow Coma Scale (GCS) score, systolic and diastolic blood pressure measurements, pulse rate, respiratory rate, and whether the patient experienced a loss of consciousness.

Initial vital signs

- **Glasgow Coma Scale:** The Glasgow Coma Scale (GCS) is used to objectively describe the extent of impaired consciousness through three aspects of responsiveness: eye-opening, motor and verbal responses. The majority of patients (66 percent) scored highest on the GCS, indicating that the patients were fully awake and responsive. Among the cases, 4 percent recorded severe disability levels in consciousness (3–8), and 2 percent recorded as moderate (9–12); the rest had no GCS scale recorded.

Table 8: Glasgow Coma Scale (GCS)

Initial Glasgow Coma Scale (GCS)	Number of RTI patients (*N*=47)	%
Mild (13–15)	31	66
Moderate (9–12)	1	2
Severe (3–8)	2	4
GCS not recorded	13	2

The two RTI patients that recorded severe GCS were a passenger and a driver. While one pedestrian was the patient that recorded the moderate GCS as shown in the cross-tabulation in Table 9.

Table 9: Cross-Tabulation—Road User Type by Glasgow Coma Scale

Road user type	Mild (13–15)	Moderate (9–12)	Severe (3–8)	Total not recorded
Passenger	7	0	1	0
Driver (includes cyclists)	14	0	1	5
Pedestrian	10	1	0	8

- **Systolic blood pressure (mm Hg):** 62 percent of patients had their systolic blood pressure within normal range, whereas 36 percent had it greater than the normal range, reaching up to 148 millimeters of mercury (mm Hg)
- **Diastolic blood pressure (mm Hg):** 71 percent of patients had their diastolic blood pressure within normal range, whereas 27 percent exceeded it reaching 90mm Hg.
- **Pulse rate (beats per minutes (bpm)):** 69 percent of patients' pulse rate fell within normal range, whereas for 29 percent the rate was greater than 90.

Figure 35: Systolic Blood Press

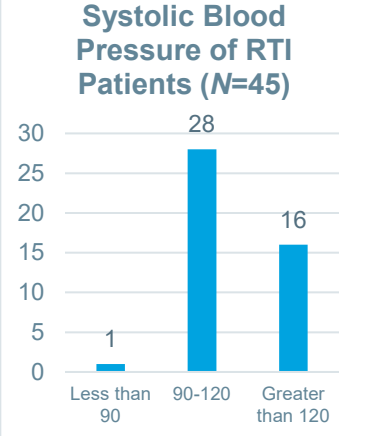


Figure 34: Diastolic Blood Pressure

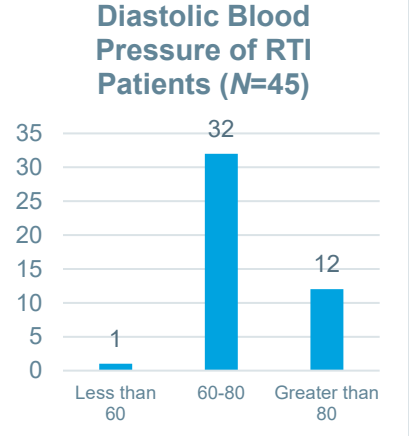
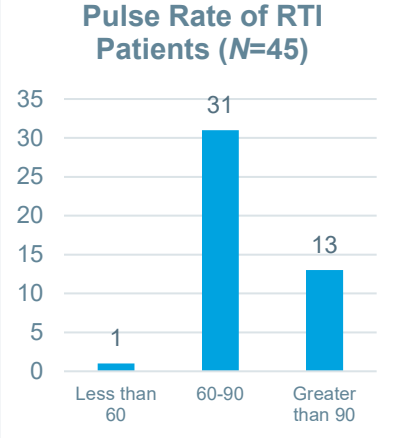


Figure 33: Pulse Rate



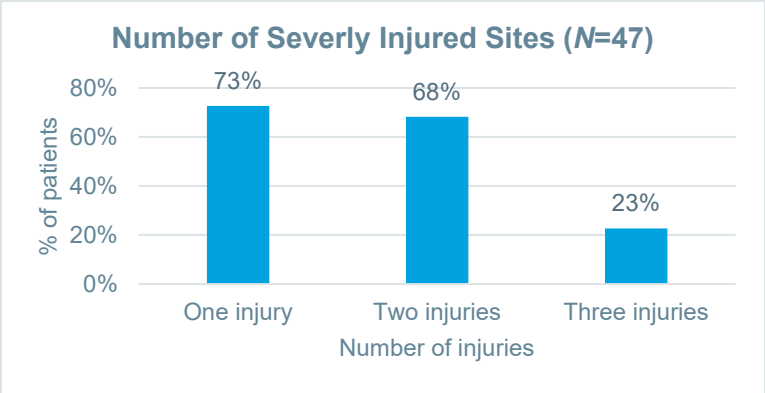
- **Respiratory rate (breaths per minute):** Thirty-seven out of 41 patients who were assessed for respiratory rate were within normal range (90 percent), 4 patients recorded the rate greater than 18.
- **Lost consciousness:** Eleven patients lost consciousness because of their RTI at the scene of the crash, while the remaining 34 did not lose consciousness. Two patients were not recorded.

4.2.5. *Injury characteristics/Type of injury*

Findings from this section illustrate the characteristics and types of injuries sustained by the patients. The injuries have been categorized based on the three most severe ones resulting from road traffic injuries. For each injury, we have examined the affected anatomy, the pathology involved, and the course of treatment administered to the patients. In this section, we also investigate patients who required ICU treatment, the length of their hospital stay, any preexisting disabilities prior to the accident, and the disposition of patients following their discharge from the hospital.

- **Number of severely injured sites:** 58 percent of RTI patients exhibited only one injury; 31 percent suffered from two injuries, while 11 percent had three injuries.

Figure 36: Number of Severely Injured Sites



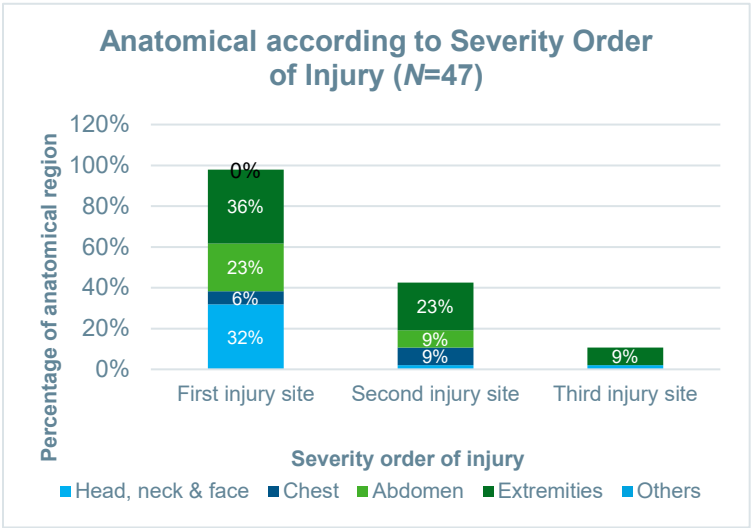
> The percentage and severity of the cases reviewed because of traffic accidents are distributed as follows:
> - 80 to 90% from simple to medium injuries
> - 5 to 10% moderate to severe injuries
> - 5% severe injuries
>
> **Princess Basma Hospital – Physician**

> Most of the injuries resulting from traffic accidents are the extremities, head & neck, and the trunk.
>
> **Al Bashir Hospital – Administrative representative**

- **Split of injury sites & anatomical region:** All RTI respondent patients had a first injury site that was most commonly in the extremities (36 percent), while 32 percent had a first injury in the head, neck, and face. Among respondent patients, 23 percent had a second injury that was in the extremities for half the cases; 9 percent of patients experienced a third injury in the extremities.

First Injury (most severe)

Figure 37: Anatomical according to Severity Order of Injury



- **Injury site/Anatomy:** The most common first injury site was the extremities (33 percent) and highest in the lower extremities (10 out of 17 patients); this was followed by injuries in the abdomen (26 percent) with a focus on the lumbar spine (9 patients), then injuries to the head and neck (23 percent or 11 patients) specifically the skull (8 patients), chest (6 percent) mostly the rib cage (2

patients), and lastly face (9 percent) with facial bones (2 patients), eyes (1 patient) and mouth (1 patient).

- **Pathology:** Eighteen patients (38 percent) were diagnosed with a closed fracture; while eight other patients (17 percent) had contusions; six patients got diagnosed with superficial lacerations; and the others were mostly diagnosed with joint injuries, deep lacerations, pneumothorax, dislocation, and vertebra injury.

Figure 39: First Injury Site

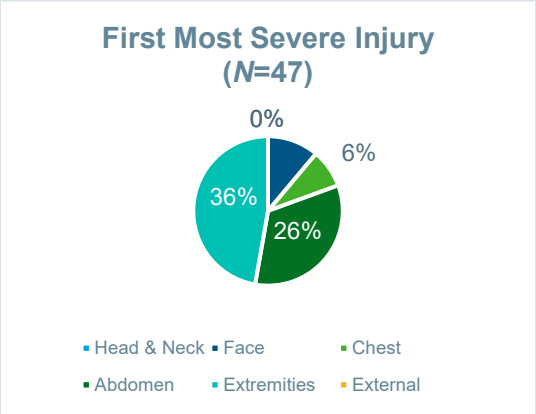
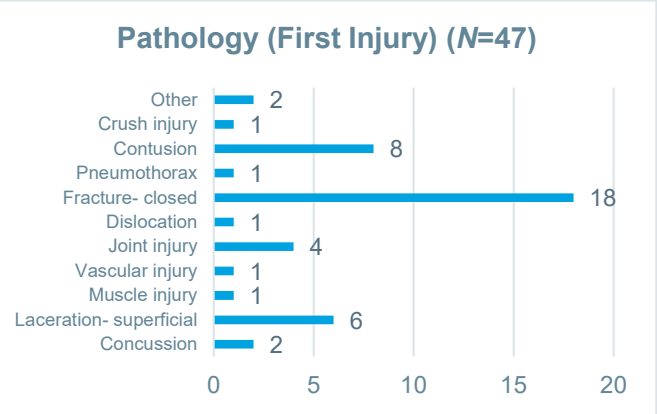
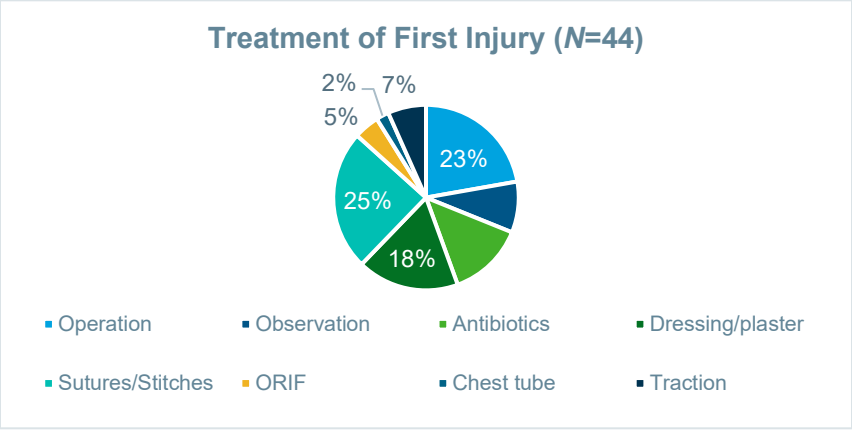


Figure 38: Pathology of First Injury



- **Treatment and procedures:** Out of the patients surveyed, 94 percent reported receiving treatments prescribed by their physicians based on their diagnoses. The most commonly reported treatments were sutures/stitches (25 percent), and 23 percent of patients underwent surgical operation. Approximately 18 percent of patients were treated by dressing or plasters for their lacerations, while 14 percent of patients were prescribed antibiotics. Among the patients who underwent operations (10 patients), the procedure primarily involved internal fixation. One patient was admitted to the hospital for their safety after causing an accident resulting in the fatality of another driver. In contrast, another patient, who worked as a taxi driver, did not undergo any medical treatment during their hospital stay, he requested to be admitted primarily for medico-legal reasons, intending to claim compensation for the malfunction and damage of his cab.

Figure 40: Treatment—First Injury



Notes: ORIF= Open reduction internal fixation

Table 10: Cross-Tabulation—Injury Site by Disability Outcomes

Injury Site (most severe)	No impairment (0–2)	Mild disability (3–12)	Moderate (13–24)	Severe disability (25–36)	Extreme (37–48)
Head & Neck	1	1	5	2	0
Chest	0	0	1	1	0
Extremities	2	4	3	1	1
Abdomen	2	1	2	3	0
Face	1	1	1	0	0

Findings from the cross-tabulation above show that most moderate disability outcomes are from head and neck injuries, followed by extremities and then abdomen, while one extreme disability case resulted from an injury to the extremities. As for severe disabilities, these were to the abdomen, followed by head and neck. Extremities are also a dominant injury for patients who suffered mild disability.

Second Injury (most severe)

- **Injury site/ Anatomy:** The extremities were the most frequently reported secondary injury site, accounting for 55 percent of the cases. Among the extremity injuries, the upper extremities (four patients) and the shoulder girdle (four patients) had the highest incidence, whereas injuries to the pelvic girdle and lower extremities combined affected three patients. Following the extremities, chest injuries (rib cage) and abdomen injuries (involving abdominal organs and lumbar spine) were reported by eight patients combined, constituting 20 percent each of the total secondary injuries. Among patient, 5 percent reported face injuries, specifically the mouth.
- **Pathology:** Nine patients were diagnosed with a closed fracture, while eight were diagnosed with contusion. Only one patient had deep laceration, and another had concussion.

Figure 41: Second Injury Site

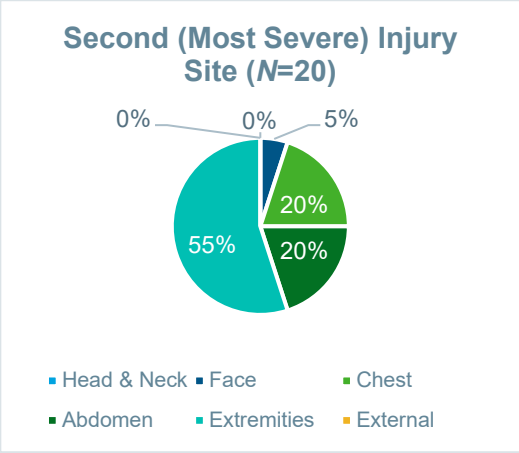
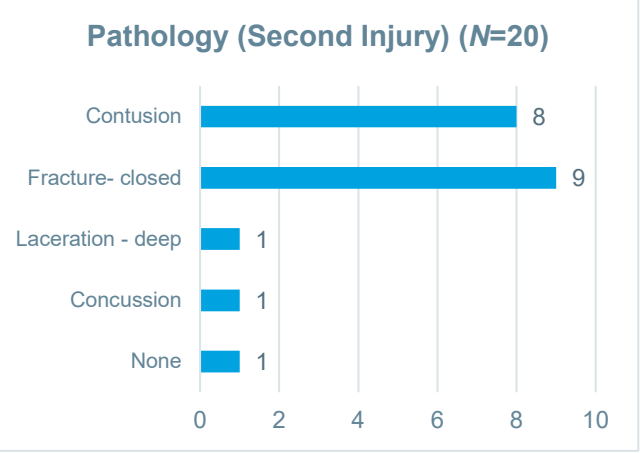
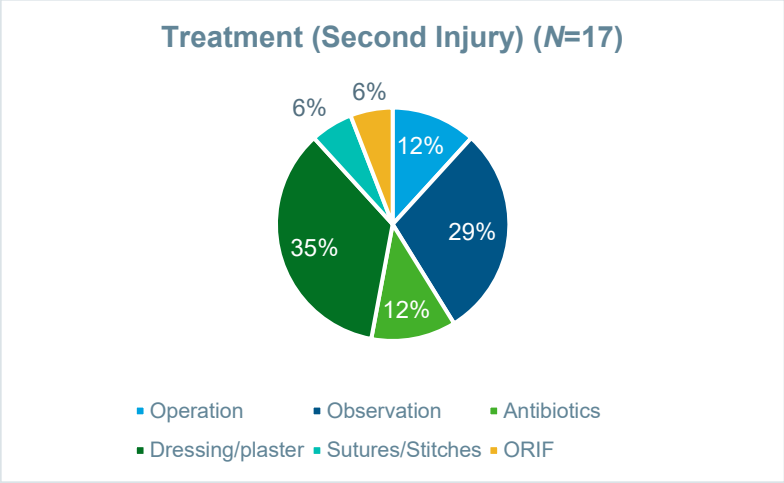


Figure 42: Pathology of the Second Injury



- **Treatment and operation:** Out of the 20 patients, 17 confirmed receiving treatment during their hospital stay. A significant proportion (35 percent) of these patients received dressing/plaster. Among the treated patients, 29 percent reported being under observation during the treatment process; 12 percent were administered antibiotics; 6 percent received sutures and stitches; and another 6 percent required ORIF. Among patients, 12 percent required any surgical operation (two patients required internal fixation).

Figure 43: Treatment—Second Injury



Notes: ORIF= Open reduction internal fixation

Third Injury (most severe)

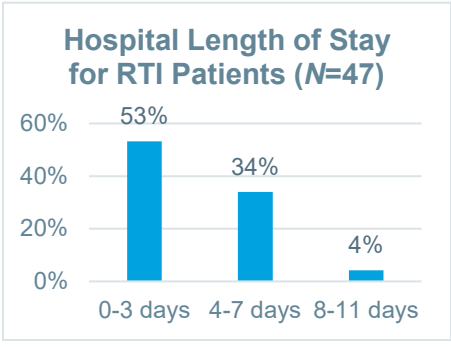
- **Injury site/Anatomy/Pathology/Treatment:** The third injury sites were mostly located in the extremities, affecting three patients in the upper extremities and one patient in the lower extremities. These injuries were characterized by contusion or closed fracture pathologies, for which patients received dressing application or were placed under observation. Another patient had an injury to the face, specifically on the nose, for which the patient underwent a surgical operation for internal fixation (*N*=5).

Hospital stay/ICU/Discharge and disability

- **Length of stay:** On average RTI patients stayed for four days at the hospital, with 53 percent having a length of stay of less than three days; 34 percent of patients stayed four to seven days, and in 4 percent of the cases patients stayed for up to 11 days. (Note: length of stay = Date of discharge from hospital – Date arrived to the hospital) (*N*=47).

> The average duration of their admission to the departments is 48-72 hours.
>
> **Al Bashir Hospital – Administrative representative**

Figure 44: Length of Stay at the Hospital



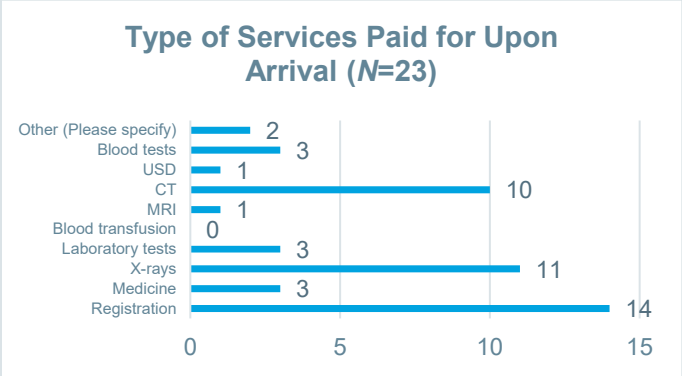
- **ICU stay:** Three cases had to stay in the ICU for a maximum of seven days for one patient; one patient stayed for four days, and the other stayed for one day.
- **Disposition of patients after at least 24 hours stay:** In 87 percent of the cases, the patients were discharged home, while we observed that in the remaining instances patients were discharged to seek care at the Orthopedic Department, and one patient died during the stay at the hospital (*N*=47).
- **Disability history/Preexisting disability:** It was rare that the patients experiencing an RTI had a preexisting disability.

Only one case was observed in which the patient had a moderate level of disability in learning and applying knowledge (*N*=46).

4.2.6. Medical care payment

- **Pay fee upon arrival:** Out of the 47 patients, 23 made a payment upon their arrival. The data collection process observed that patients arriving at the hospital with urgent medical needs or through an ambulance were exempted from payment. This exemption underscores the hospital's priority to address critical medical emergencies before attending to financial considerations.
- **Amount paid upon arrival:** The 23 patients who paid a fee upon arrival did so based on the initial doctor's assessment of the urgency of their medical condition. Among these patients, 14 paid an amount ranging from JD 40 - 60, covering expenses for both a Computed tomography (CT) scan (typically valued at JD 47) and a medico-legal report, which was priced at JD 7. Notably, due to uncertainty, individuals often rounded up their payment amounts. The hospital's services also included the option for patients to undergo additional medical procedures such as magnetic resonance imaging (MRI), Ultrasound, and lab tests, for which a maximum of JD 640 was charged for one patient. However, in certain cases, the precise amount paid upon arrival was uncertain due to ongoing legal proceedings, as the initial fee was covered by the party at fault in the accident. Other patients were paying for the medico-legal report process (JD 7).

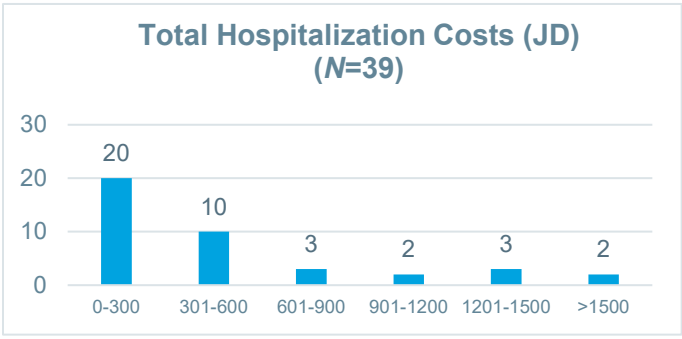
Figure 45: Types of Services Paid for Upon Arrival



Notes: CT= Computed tomography, MRI= Magnetic resonance imaging, USD= Ultrasound

- **Total patient expenses:** Among the 39 cases that disclosed information for this question, 20 individuals, incurred costs ranging from JD 0 - 300. Similarly, 10 more patients paid in the JD 301–600 range. An additional three patients fell within the JD 601–900 cost bracket, Furthermore, two patients had expenses within the JD 901–1,200 range, and three patients fell within the JD 1,201–1,500 range. Notably, two cases were reported with hospitalization costs exceeding JD 1,500. Eight patients did not disclose the total amount they paid.

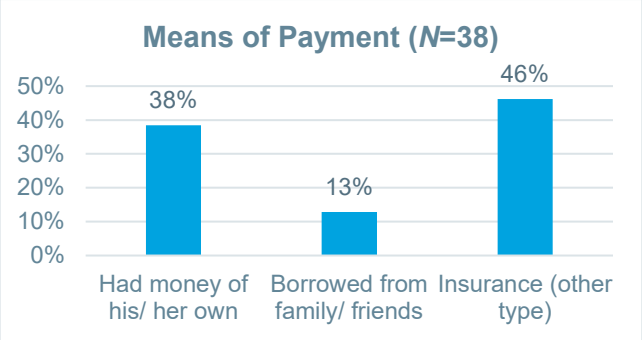
Figure 46: Total Hospitalization Costs



Means of payment: Eighteen of the patients indicated that their expenses were covered through the legal process, involving either insurance or direct payment by the individual at fault in the accident. Fifteen patients confirmed that they personally covered the costs from their own funds. Additionally, five patients relied on assistance from friends and family, borrowing money to settle their hospital bills. Nine other patients chose not to disclose the specific means through which their payments were completed.

> The number of claims received annually related to RTIs (Road Traffic Injuries) is 13,000. Additionally, the percentage of claims related to RTIs that are usually approved yearly is 30%.
>
> **Insurance company representative**

Figure 47: Means of Payments for Hospitalization

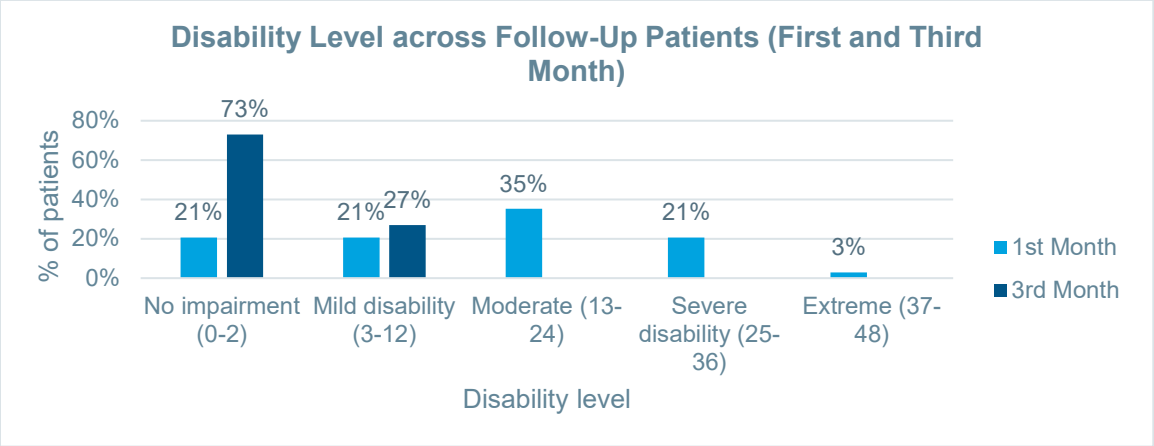


4.3. Results of One-Month and Third-Month Follow-Up Survey and Disability Scores

First-month follow-up: A total of 34 patients have completed the follow-up telephone survey, while one patient did not complete the survey (patient was not reachable on provided contact details). Among 34 patients, 79 percent were experiencing some form of disability at the one-month follow-up. Out of the 34, one patient stated extreme disability, meaning that a problem is present more than 95 percent of the time, with an intensity that is totally disrupting the person's day-to-day life, and which happened every day over the last 30 days. Seven patients (21 percent) stated that they suffered from severe disability, which means an issue that occurs more than half of the time, with a moderate level of disruption to the individual's daily activities and has been happening regularly over the past 30 days. While 35 percent of patients stated moderate disability (a problem that is present less than 50 percent of the time, with an intensity that is interfering in the person's day-to-day life, and which happened occasionally over the last 30 days). Among patients, 21 percent indicated that they suffered from mild disability (problem that is present less than 25 percent of the time, with an intensity a person can tolerate, and which happened rarely over the last 30 days), and similarly 21 percent suffered no disability during the first 30 days after discharge due to the road traffic accident.

Third-month follow-up: Twenty-six patients have completed the three-month telephonic survey. During the telephonic interviews 19 respondents of the 26 stated that they faced no disability or impairment in the past 30 days, while 7 of the 26 respondents stated that they faced mild disability since the last interview, meaning that a problem is present less than 25 percent of the time, with an intensity a person can tolerate, and which happened rarely over the last 30 days.

Figure 48: Disability Level across Follow-Up Patients



Overall disability score: The disability score was calculated using data from module A by adding the points from each response across the six domains. The score ranges from 0 to 48, with higher scores indicating higher levels of disability. The trend below shows that during the third month the overall disability score dropped significantly.

Table 11: Overall Disability Score–One- and Three-Month Follow-Up

Disability level	First Month	Third Month
No impairment (0–2)	7	19
Mild disability (3–12)	6	7
Moderate (13–24)	7	0
Severe disability (25–36)	7	0
Extreme (37–48)	1	0
Overall disability score (Mean)	**18.4**	**3.2**

Table 12: Overall Disability Score Comparison between Different Countries

Overall Disability Score	Jordan	Bangladesh	Cambodia	Ethiopia	Mexico	Ukraine	Zambia
1-month follow-up	18.4	37.9	24.3	27.4	25.2	22.2	16.1
3-month follow-up	3.2	27.2	16.5	16.8	16.8	15.3	9.8

Source: World Bank. "Beyond the Numbers: Estimating the Disability Burden of Road Traffic Injuries—Findings from Six Low and Middle-Income Countries, 2023

Comparing Jordan to different low- to middle-income countries, we can consider Jordan on the lower scale of the overall disability score for first-month follow-up data (18.4) compared to other countries: Bangladesh with the highest overall disability score (37.9), followed by Cambodia (24.3), Ethiopia (27.4), Mexico (25.2), Ukraine (22.2), and Zambia with the lowest (16.1).

4.3.1. Cognition ability

- **Concentrating for 10 minutes:** Out of the 34 patients, 38 percent reported experiencing moderate difficulty in concentrating for 10 minutes, 18 percent indicated severe difficulty, and another 24 percent reported mild difficulty. Additionally, 21 percent of the patients stated that they had no difficulty in concentrating for the specified duration. During the third-month follow-up, it was observed that all 26 patients were experiencing either no difficulty or mild difficulties. Notably, the seven patients that were facing mild difficulties in the third month were initially classified as moderate to severe difficulties during the first-month follow-up. Consequently, there has been a noteworthy improvement in the ability to concentrate for more than 10 minutes between the first- and the third-month follow-up.
- **Difficulty in learning a new task:** Among patients, 41 percent reported experiencing moderate difficulty in learning a new task; 18 percent indicated severe difficulty; 21 percent reported mild difficulty; 21 percent stated they had no difficulty in learning a new task. During the third=month follow-up, patients who stated they faced severe or moderate difficulties had shifted to either mild or no difficulties in learning a new task. This shows improvement in the disability score between the two follow-ups.

Figure 50: Concentrating for 10 Minutes

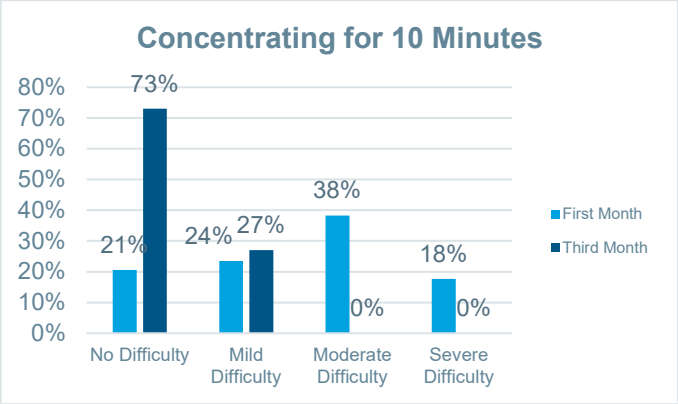
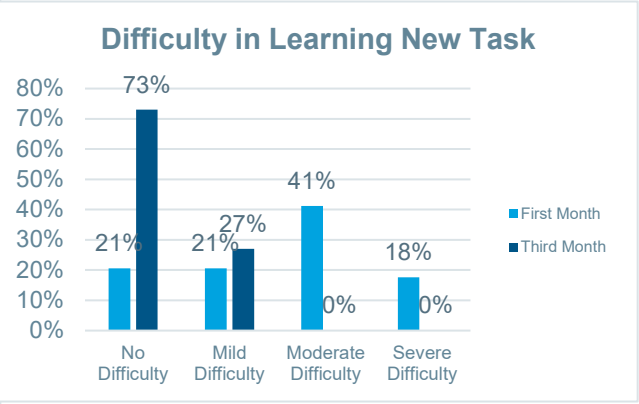


Figure 49: Difficulty in Learning New Task



4.3.2. Mobility

- **Standing for long periods:** Patients initially experienced severe (21 percent), moderate (38 percent), or mild (21 percent) difficulties in standing for long periods of time during the first-month follow-up, improvements have been shown during the third-month follow-up as the distribution has shifted, with patients only facing mild difficulties (27 percent) and no difficulties (73 percent) in doing this activity.
- **Walking long distances:** Among the survey patients, 21 percent reported having no difficulty walking a long distance of 1 km. Another 21 percent experienced mild difficulty, 35 percent

Figure 52: Standing for Long Periods

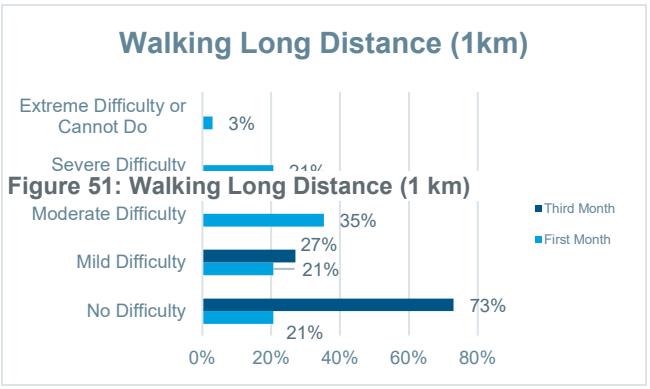
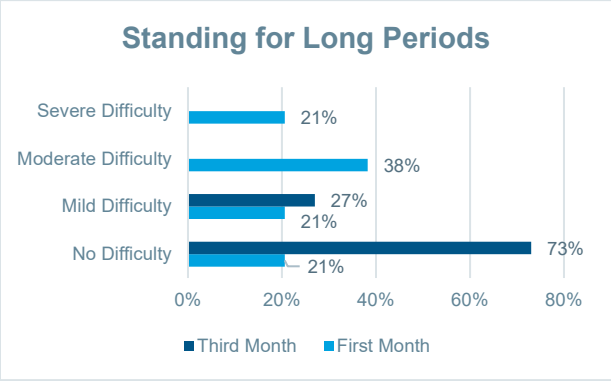


Figure 51: Walking Long Distance (1 km)

encountered moderate difficulty, and 21 percent faced severe difficulty. Additionally, 3 percent (one patient) reported extreme difficulty or the inability to walk a long distance of 1 km. In the third-month follow-up, all patients facing severe difficulties transitioned to either mild or no difficulties, similarly patients initially reported moderate and mild difficulties during the first-month follow-up to walk for long distances.



4.3.3. Life activities

- **Difficulty in taking care of household responsibilities:** Out of the total sample size of 34 patients, none reported extreme difficulty or an inability to perform household responsibilities, while 21 percent did not encounter any difficulty in taking care of household responsibilities. An additional 21 percent reported mild difficulty, while 38 percent experienced moderate difficulty. Similarly, 21 percent faced severe difficulty.
  Among patients, 27 percent experienced mild difficulty only during the third-month follow-up, which is an improvement from the first-month follow-up. While the rest of the patients stated that they have no difficulties in taking care of household responsibilities three months after discharge.
- **Day-to-day school/work activity:** 21 percent did not encounter any difficulty in performing day-to-day school activities. An additional 24 percent reported mild difficulty, while 32 percent experienced moderate difficulty. Similarly, 15 percent faced severe difficulty. Additionally, 9 percent either found it extremely difficult or were unable to perform school activities; 73 percent did not encounter any difficulty in performing day-to-day school/work activities in the third-month follow-up. The remaining reported mild difficulty in performing these activities.

4.3.4. Participation in society

- **Joining community activities:** 21 percent reported no difficulty in joining community activities during the first-month follow-up. Meanwhile, 24 percent faced mild difficulty, and 38 percent experienced moderate difficulty. Similarly, 18 percent encountered severe difficulty. Patients who experienced severe, moderate, or mild difficulties in the first month, transitioned to facing mild or no difficulties in joining community activities during the third-month follow-up.
- **Emotionally affected by health problems**: 21 percent reported that they were not affected emotionally by their health problems. Meanwhile, 24 percent indicated that they were mildly affected, and 38 percent stated that they were moderately affected. Similarly, 18 percent reported being severely affected emotionally. None of the patients in this sample were extremely affected; 73 percent reported that they were not affected emotionally by their health problems during the third-month follow-up, which shows improvement from the first-month follow-up when patients did in fact suffer emotionally either severely or moderately due to the RTI. The rest of the patients stated during the third-month follow-up that they face mild difficulties due to their health problems.

4.3.5. Self-care

- **Washing whole body:** 21 percent stated no difficulty washing the whole body, similarly 21 percent reported mild difficulty. Furthermore, 41 percent expressed facing moderate difficulty in performing this task, and 15 percent encountered severe difficulty. Additionally, 3 percent of the individuals mentioned experiencing extreme difficulty or being unable to wash the whole body; 73 percent stated no difficulty washing the whole body during the third month, which is almost a 50 percent increase from the first month; while only 27 percent reported mild difficulty during the third-month follow-up survey, showing significant improvement in washing of the whole body between the two follow-up surveys.
- **Getting dressed:** 21 percent out of the 34 patients did not experience any difficulty getting dressed. Meanwhile, 24 percent faced mild difficulty, and 38 percent encountered moderate difficulty. Similarly, 18 percent had severe difficulty, while none of the patients reported extreme difficulty or an inability to get dressed. Meanwhile, the trend in disability dropped during the third-month follow-up and shifted from severe and moderate disability to only 27 percent facing mild difficulty in getting dressed while the rest of the respondents faced no disability in this activity.

Figure 54: Washing Whole Body

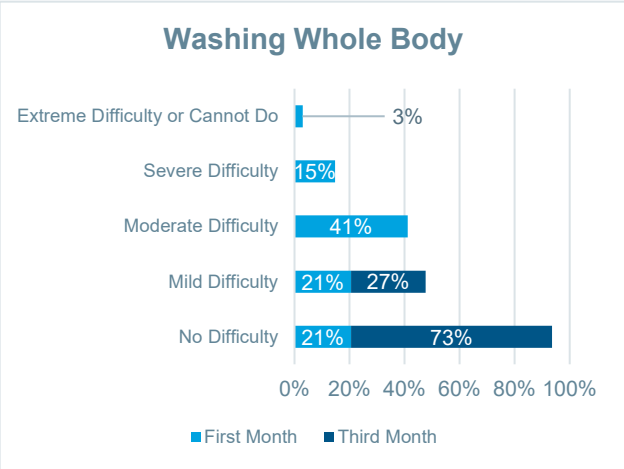
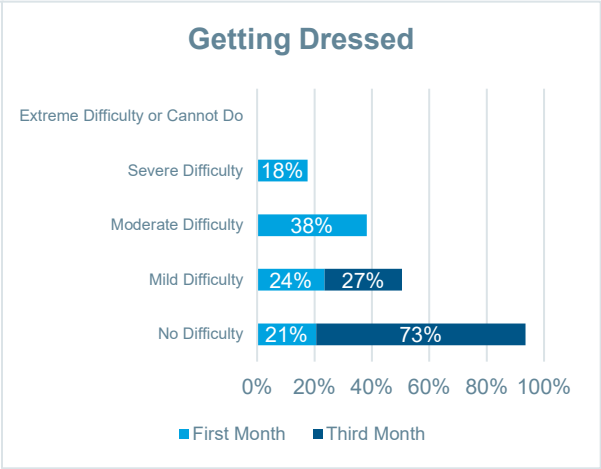


Figure 53: Getting Dressed



4.3.6. Getting along with people

- **Dealing with people you do not know:** Out of the 34 patients, 24 percent did not encounter any difficulty dealing with people they don't know. Meanwhile, 26 percent faced mild difficulty; 41 percent experienced moderate difficulty; 9 percent reported severe difficulty; while none expressed extreme difficulty or an inability to manage people they don't know. Similarly, 73 percent did not encounter any difficulty dealing with people they do not know in third-month follow-up, and 27 percent faced mild difficulty, while none of the patients expressed extreme difficulty or an inability to manage people they do not know.

- **Maintaining friendships:** None of the patients expressed extreme difficulty or an inability to maintain friendships; 26 percent did not encounter any difficulty. Similarly, 29 percent faced mild difficulty, and 38 percent experienced moderate difficulty in maintaining friendships. Additionally, 6 percent reported severe difficulty in this area. The third-month follow-up resulted in a trend shift and improvement, as the cases that stated severe and moderate difficulty in maintaining friendships in the first-month follow-up shifted to mild or no difficulty during the third-month follow-up.

Figure 55: Dealing with People You Do Not Know

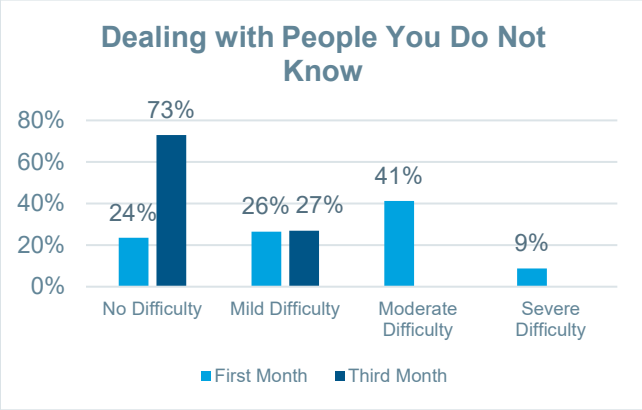
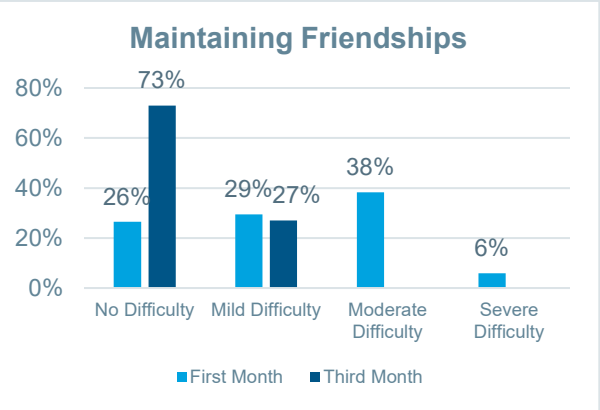


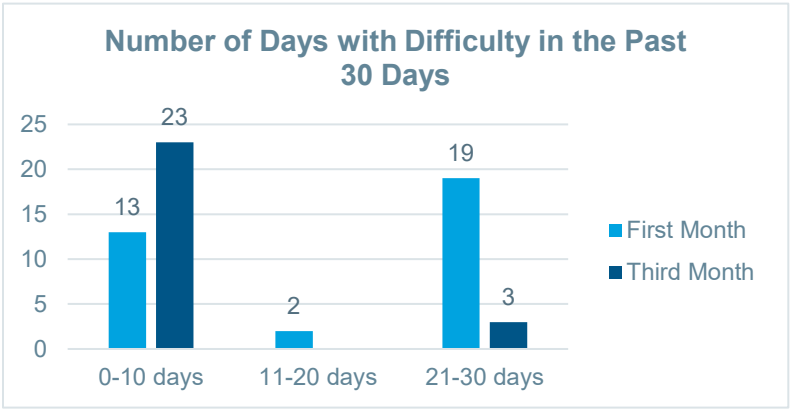
Figure 56: Maintaining Friendships



4.3.7. Number of days with difficulties

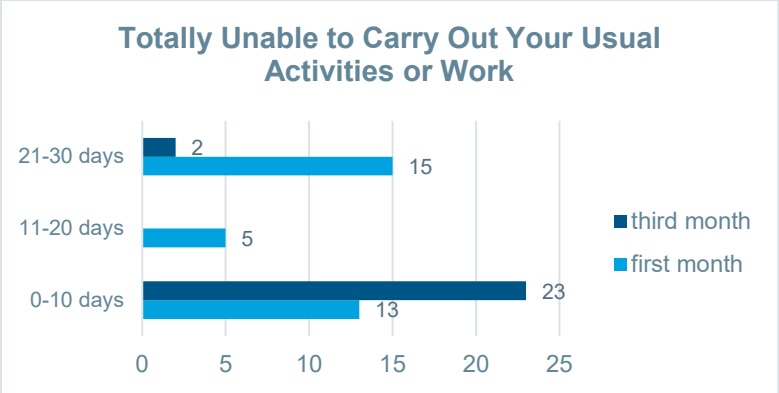
Patients who were followed up after the first month of discharge experienced difficulties for 18 days on average, reaching 30 days for 19 patients. Similarly, 13 patients experienced difficulties up to 10 days, while two patients stated that they experienced difficulties between 11 and 20 days. As for patients who were followed up after three months, they experienced difficulties for five days on average, 23 patients experienced difficulties up to 10 days, while three patients experienced it for up to 30 days. Results demonstrate the improvement from third-month follow-up compared to first-month follow-up, as most patients experienced difficulties up to 10 days during the third month, compared to the first month when almost 50 percent of respondents experienced difficulties for 21 to 30 days.

Figure 57: Number of Days with Difficulties



- **Totally unable to carry out your usual activities or work because of any health condition for the first 30 days after discharge**: During the first-month follow-up, 13 of respondents stated that they totally could not carry out usual activities and work up to 10 days in 30 days, while 15 said it was between 21 to 30 days, and only five respondents between 11 and 20 days. As for the third-month follow-up, 23 respondents stated they were totally unable to carry out usual activities for up to 10 days, while only two stated they faced the same difficulties but between 21 and 30 days.

Figure 58: Totally Unable to Carry Out Your Usual Activities or Work

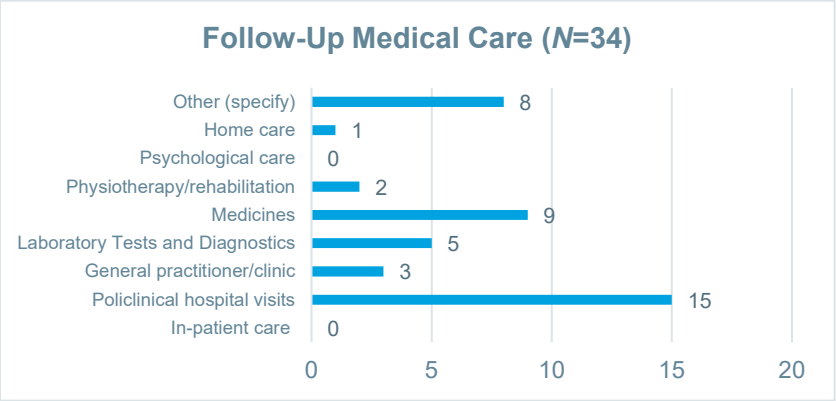


- **In the last 30 days, not counting the days that they were totally unable to carry out usual activities, for how many days did the patient cut back or reduce their usual activities or work because of any health condition:** Out of the 34 patients in the first follow-up, 91 percent reported cutting back or reducing their regular activities or work due to their health condition for a period of up to 10 days following discharge. In contrast, 9 percent stated that this reduction lasted between 11 and 20 days, excluding the days during which they were entirely unable to perform these activities. None of the patients experienced a reduction in work or regular activities lasting longer than 21 days.
  While during the third-month follow-up, 100 percent of the patients (25) reported cutting back or reducing their regular activities or work due to their health condition for a period of up to 10 days in the last 30 days.
- **Return to normal life/usual activity/work:** Out of the 34 patients in the first-month follow-up, 21 reported having returned to their normal life and usual activities, while 13 indicated that they had not. Similarly, with respect to returning to work, 21 of the patients had resumed work, whereas 13 had not.
  In the third-month follow-up, 25 patients reported having returned to normal life and usual activities and returning to work. While one patient stated they had not returned to normal life/work since the crash.
- **Special equipment used:** Out of the 34 patients in the first follow-up, 11 patients reported the use of special equipment (assistive devices) for the first 30 days post discharge. Eight patients used mobility aids, such as wheelchairs, scooters, walkers, canes, crutches, prostheses, and orthotic devices; while two patients used physical modifications in the built environment, including ramps, handle rails, grab bars, and wider doorways; and one patient used devices and features of devices to help perform tasks such as cooking, dressing, and grooming (examples include specialized handles and grips, devices that extend reach, and lights on telephones and doorbells).
  As for the third-month follow-up, only two patients out of the 26 used special equipment (assistive devices), which is an improvement from the first month; mobility aids used in third month were wheelchairs, scooters, walkers, canes, crutches, prostheses, and orthotic devices.

4.3.8. *Medical costs:*

- **Follow-up medical care due to RTI since discharge from hospital, first-month follow-up respondents:** Out of the 34 patients surveyed, 15 reported having visited a polyclinical hospital (outpatient clinic). Other patients mentioned various other health care services, including lab tests and diagnostics, general practitioners (GPs), medications, physiotherapy, and rehabilitation. Additionally, some patients referred to specific services such as stitches removal and obtaining medical reports.

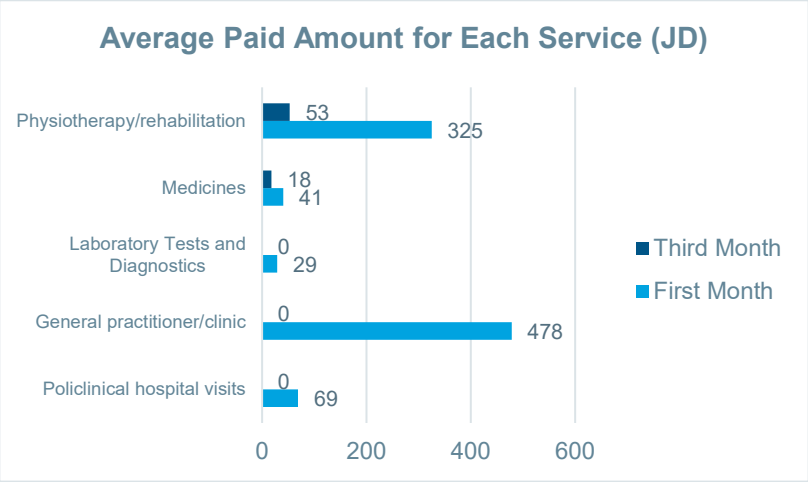
Figure 59: Follow-Up Medical Care



Out of the 26 respondents surveyed in the third-month follow-up, six reported having visited physiotherapy and rehabilitation, one bought medicines, one needed home care services, 20 respondents stated they did not need any medical care in the last 30 days.

- **Average paid amount (in JD):** Average amount paid for the GP or clinic was about JD 478 based on three patients out of the 34 (8 percent of respondents), while two patients paid an average of JD 325 for physiotherapy. Others paid JD 30 on average for laboratory tests and diagnostics, and JD 26 for outpatient clinics. On average, JD 41 was paid for medicines, and JD 12 was paid on average for medical equipment. Twenty-one patients stated they had paid for follow-up medical care and equipment out-of-pocket, while 13 patients were covered by the person who caused the crash. Respondents from the third-month follow-up who underwent physiotherapy paid an average of JD 53 in the last 30 days, while the respondents who bought medicines paid JD 18. All respondents stated they had paid for follow-up medical care out-of-pocket.

Figure 60: Average Paid Amount for Each



4.3.9. *Environmental factors for third-month follow-up*

Sixteen patients proceeded with the section on environmental factors that might affect the respondent's ability to do usual work, while 10 respondents dropped out during this section.

- **Same opportunities as other people to participate in and take advantage of education:** Fourteen respondents stated they have the same opportunities as other people to participate in and take advantage of education; one respondent said "no," and another stated "don't know."
- **Same opportunities as other people to participate in and take advantage of employment:** Fourteen respondents said they have the same opportunities as other people to participate in and take advantage of employment; one respondent said "no," and another stated "don't know."
- **Same opportunities as other people to participate in and take advantage of recreation/leisure:** Fifteen respondents out of 16 stated they have the same opportunities as other people to participate in recreation and leisure activities, and one respondent stated that they do not have the same opportunity due to the health condition.

Figure 63: Participate In and Take Advantage of Education

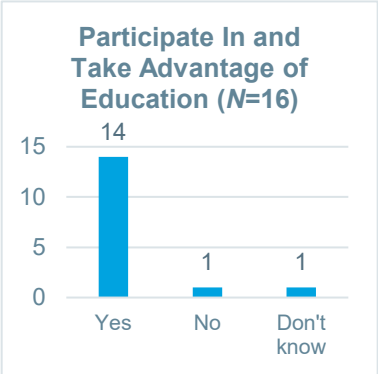


Figure 62: Participate In and Take Advantage of Employment

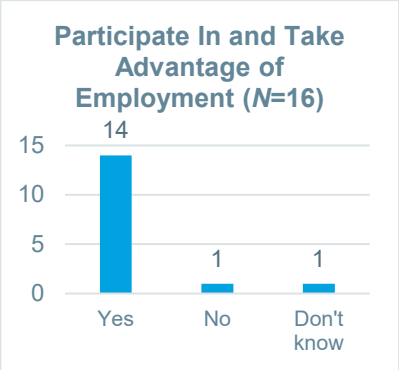
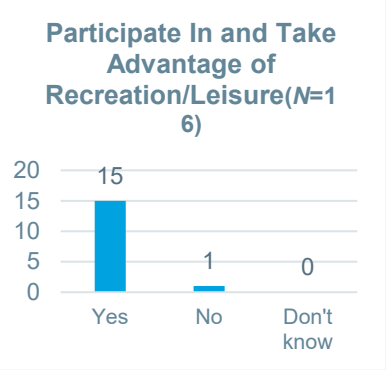


Figure 61: Participate In and Take Advantage of Recreation/Leisure



- **Availability of transportation:** Thirteen respondents stated they have never faced any problems with availability of transportation. Two respondents stated they have faced this problem but less than monthly since the injury, and both stated that, if faced with this issue, they considered, this a little problem. One participant stated that this problem is not applicable as he stayed at home studying for the General Secondary Education Certificate Examination in Jordan and Palestine and did not have to use transportation.
- **Availability of information needed in a format you can use or understand:** The same two respondents stated they have faced an issue less than monthly with finding the needed information in a format that they can use and understand, and they have found it to be a little problem once they face this. The other 13 respondents stated that they never face such problem. One other respondent stated that he did not need to find any information during that period of time.

- **Availability of health care services and medical care:** The same two respondents stated they have faced this issue less than monthly, and another respondent stated they faced this issue of availability of health care services and medical care information monthly, but considered the issue a little problem. The other 13 respondents stated they never face such a problem.

Figure 64: Availability of Transportation

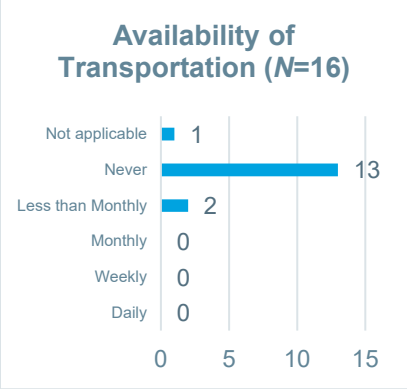


Figure 65: Availability of Information

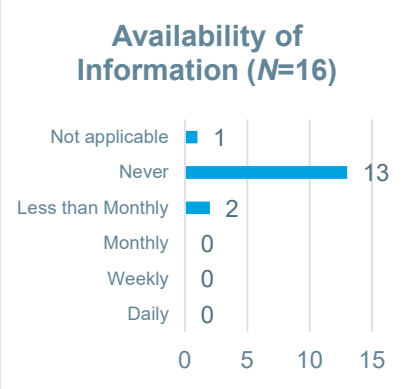
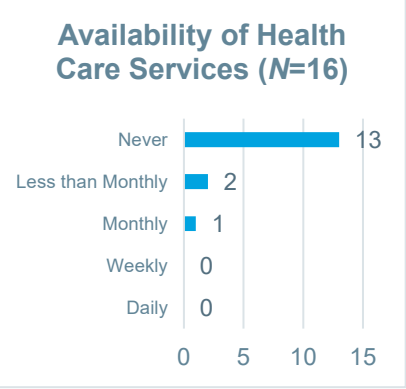


Figure 66: Availability of Health Care Services and Medical Care



- **Help from someone else at home:** Two respondents stated that they faced a problem if they needed someone's help at home monthly, while two others stated it was less than monthly; when they do need help at home, all four respondents consider it a little problem. Twelve respondents said they have never faced this problem at home (*N*=16).
- **People's attitudes at home:** Two respondents stated they have faced little problems less than monthly with people's attitude toward them at home, while 13 respondents stated they have never faced this issue at home with people's attitudes. One respondent stated that this is not applicable as they live alone (*N*=16).
- **Prejudice and discrimination:** Thirteen respondents stated they never faced any prejudice or discrimination since the injury, while two patients stated they did face this problem but less than monthly, and they have considered it a little problem. One respondent stated that this is not applicable (*N*=16).
- **People's attitudes at school or work:** Similarly, 13 respondents stated they never faced any problems with people's attitudes at school or work since the injury, while two patients stated they did face this problem but less than monthly, and one other respondent stated they face this problem monthly, but they all have considered it a little problem (*N*=16).
- **Help from someone at school or work:** Thirteen respondents stated they have never faced any problems with finding help from someone at school or work, while two respondents stated they have faced this problem but less than monthly since the injury, and another two stated they face it monthly. The four respondents stated they considered this a little problem if faced with this issue (*N*=16).
- **Policies and rules of business and organizations:** Two respondents stated they have faced little problems less than monthly with policies and rules of business and organizations since the injury; another respondent stated they faced this monthly, while 13 respondents stated they have never faced an issue with policies and rules of business and organizations. (*N*=16).
- **Government programs and policies:** Thirteen respondents stated they never faced any problems with government programs and policies since the injury; while two patients stated they did face this

problem but less than monthly, but they have considered it a little problem. One respondent stated that this is not applicable (*N*=16).

- **Natural environment (temperature, terrain, climate, etc.):** Fourteen respondents out of 16 stated they have never faced any problems with the natural environment since the injury, while two stated they have faced a little problem less than monthly with this issue (*N*=16). Similarly, for other aspects of the surroundings (lighting, noise, crowds, etc.).

Main Study Findings

Demographics

- Respondents were mostly males accounting for 79% of patients. The average age of RTI patients was 34 years, and they belonged to the 18–44 age group
- 55% of respondents had a high school education, and 21% held a bachelor's degree. 34% of RTI patients are daily-wage laborers while 32% are salaried workers

Crash characteristics

- As per study findings most crashes occurred during early morning hours and night at the main roads.
- Most of the vehicles involved in the crash were cars (72%) followed by motorcycles.
- Majority of the crash patients were not using any safety equipment such as seatbelts and helmets, highlighting behavior change requirements in the community.

Prehospital care

- 74% of the respondents received care at the scene of the accident, while rest of patients did not receive any care at the scene. In most cases, by ambulance staff (54%) and in some cases by bystanders (34%).
- Wound care was the most common service received by the patients at the scene, followed by fracture immobilization provided by the ambulance staff.

Patient condition at arrival to ER

- Most patients (66%) scored highest on the Glasgow Come Scale (GCS) indicating that the patient was fully awake and responsive at the time of arrival in the Emergency Room (ER).
- While rest of the patients lost consciousness because of their RTI at the scene of the crash.

Injury characteristics and treatment availed at the hospital

- Majority of RTI patients recruited for the study (58%) exhibited only one injury, 31% suffered from two injuries, while 11% had three injuries. The most common injury among the most severe injuries were located at the "extremities."
- The most common treatments provided were sutures/stitches (25%), followed by surgical operations (23%). Among the patients who underwent operations, the procedure primarily involved internal fixation for fractures.

Medical care expenses during hospitalization

- 49% of patients made a payment upon their arrival. Among paying patients, 60% paid an amount ranging from 40 to 60 JOD. 51% costs ranging from JD 0 – 300, and 25% patients paid in the range of JD 301 – 600, and the rest paid JD 901 and more. 46% of patients indicated that their expenses were covered through the legal process, while 38% of patients confirmed that they personally covered the costs from their own funds, and 13% of patients relied on assistance from friends and family, borrowing money to settle their hospital bills.

Follow up care patient expenses

- All respondents stated that they had paid for follow-up medical care out of their own pocket. 73.5% of patients incurred financial expenses for one-month follow-up and 23% during third-month follow-up. Expenses in the first-one month follow-up were around GP or clinic, physiotherapy, polyclinic visits, medicine, and lab tests, while during the third month, it was mostly physiotherapy and medicines. On an average, the patient paid JD 134 during the first-month follow-up and JD 11 during the third-month follow-up.

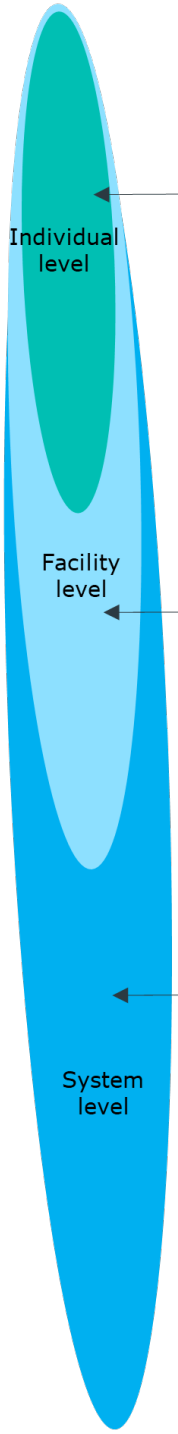
Disability Outcomes

- During the follow-up surveys, 79% of patients were experiencing some form of disability at one-month follow-up. During the first 30 days after discharge, 3% of patients stated extreme disability, 21% stated that they suffered from severe disability, 35% moderate disability, 21% patients indicated that they suffered from mild disability, and 21% suffered no disability due to the road traffic accident. During the third-month follow-up, 73% of respondents stated that they faced no disability or impairment in the past 30 days, while 26% respondents stated that they faced mild disability since the last interview.

SECTION 5: Key Issues and Recommendations

5. Key Challenges around Access to Quality and Affordable Health Care Services for RTA Patients, Access to Data and RTI Patient Retention

Figure 67 - Key challenges



Access to health care challenges

Financial constraints

As medico-legal cases are not covered under cashless insurance scheme, particularly among those without third-party insurance, the financial burden associated with the treatment of RTI cases becomes a significant deterrent, prompting many individuals to avoid seeking hospitalization altogether and leave against medical advice.

Seeking quality healthcare

Paying patients prefer private facilities for treatment due to better quality of services and request for early discharge at the government facilities, leading to high number of early discharges before 24 hours.

Patient behavior

Majority of RTIs were observed in male population in the age groups of 25–40 years of age. 67% of crash victims were not using safety equipment such as seat belts and helmets and mentioned technical conditions of the vehicle driven as cause for crash.

This trend has also highlighted that accidents were most common in working-class (salaried/ daily wage workers) in early morning hours or nighttime on highways and main roads with speed limit above 60–80 km/hr., leading to over speeding.

Access to data challenges

Lack of RTI patient level data/records at hospital level

Hospitals do not keep record for RTI cases treated in the hospitals, RTI patients are recorded as trauma cases. RTI numbers are reported to PSD by accident representative or hospital staff in a parallel system and these data lack categorization (e.g., Admitted/Discharged/Age/Gender, etc.) Hospitals do not have visibility on RTA cases admitted and types of services provided to RTI cases for service planning.

Inaccessible cost data around RTIs at the hospital/ facility level

At hospital level, data around spent on RTI cases were not captured due to different reimbursement policies for medico-legal cases, lack of detailed patient bills, and limited access to detailed financial records around hospital spent/expenditure as most of the procurements are managed centrally in public hospitals. This did not allow us to calculate economic impact of RTI cases on health systems in Jordan.

RTA case tracking and patient retention related challenges

Lack of clear evidence around RTI case load and missed cases in the system

Currently there is no mechanism to track RTI cases in the system. There have been noted inconsistencies in the reported cases between the MOH and PSD. The MOH is observed to have much lower numbers of RTA cases at hospitals, whereas PSD records indicate a significantly higher number.

Lack of policies and SOPs around RTA reporting at MOH level

There are no defined protocols and SOPs at the hospital level to report and record RTA cases, all traumas are treated the same under the WHO, ICRC, and MSF Interagency integrated triage tool: Age ≥ 12. There is lack of unified method or criteria to define cases as severe, mild, moderate as categorized in the annual RTA report between MOH staff and PSD. ER staff do not have any trainings around RTI case recording and reporting as these cases are classified as trauma.

Delayed/No Insurance reimbursements for medico-legal cases of RTIs

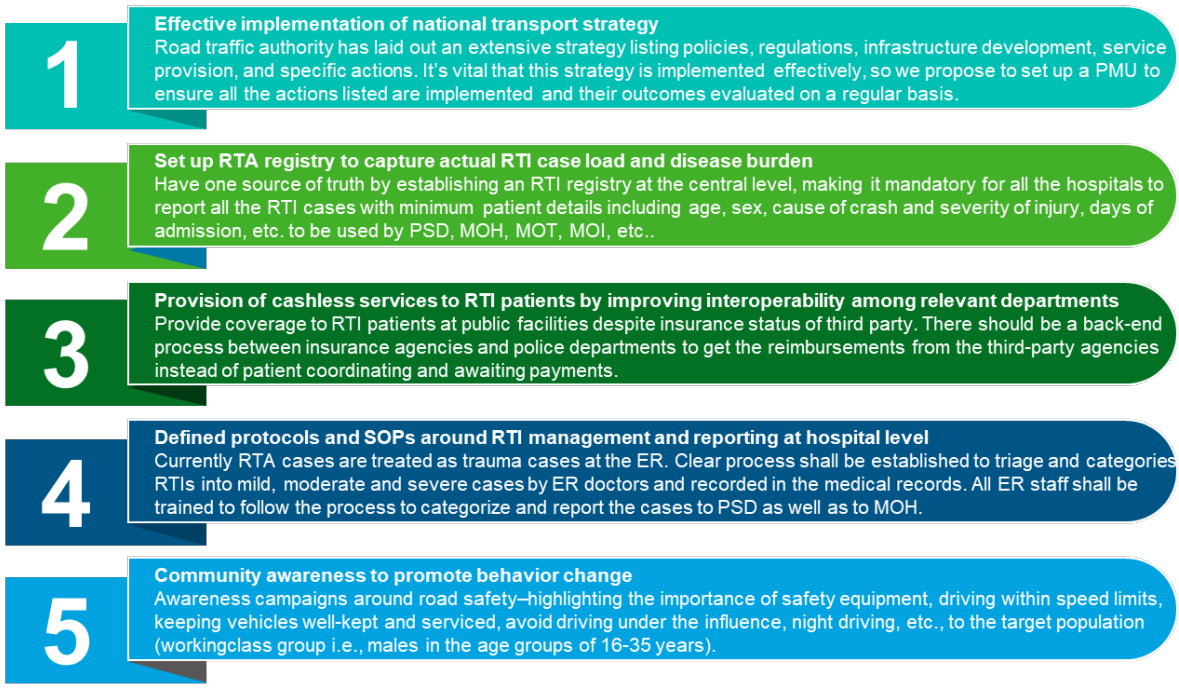
All RTI are classified as medico-legal cases and are not covered under the umbrella of Ministry of Health insurance coverage, requiring patients to cover the expenses themselves or seek compensation from the party at fault. Following a road crash, both parties involved undergo hardships, whether resulting in bodily harm or vehicle damage. The absence of established procedures between hospitals and insurance companies to cover the accident-related injuries contributes financial burden, particularly for financially disadvantaged crash-causers unable to afford the requisite insurance for the treatment of the injured at hospitals. Even if the responsible party pays for the treatment of the injured, insurance companies often delay coverage until they acquire a definitive medical report, potentially prolonging the process for several months.

6. Recommendations

RTIs lead high burden of disease and disability among the population and are a leading cause of death among the younger population. They are also a significant financial burden on health systems in Jordan. Even though Jordan is better than similar countries in the region, there is still scope for improving RTI prevention and treatment services across the country. Health facilities and trauma centers are concentrated in major cities, whereas the majority of severe crashes occurred on major highways leading to longer access time. The pressing need is to have a comprehensive strategy to cater to RTI prevention, management, and treatment across Jordan. This requires concentrated efforts from several agencies that have direct impact on population health and treatment-seeking behavior, including the Road and Traffic Department, Public Security Directorate, MOH, Ministry of Interior, insurance agencies, private sector providers, etc. Systemic changes need to be made for further impact, including a broader agenda for overall RTI prevention, early intervention, an expanded focus on streamlined reporting of RTIs across Jordan aiding evidence-based decision-making and policy-shaping.

We have developed our recommendations with this high level of aspiration in mind. We believe that current RTI policies are well-designed so there are no real changes to what these aim to do but changes to how these should be implemented. The major thrust of these recommendations is as follows:

Figure 68 - Key recommendations



1. Community-level recommendations

It is important to implement targeted interventions to focus on the high-risk groups and most vulnerable to accidents and instill behavioral changes. Focusing on prevention of accidents helps reduce the burden on health systems.

- **Raise awareness among the targets group**

The majority of accidents were observed among the male population in the age group of 18–35 years. These were mostly the working-class group, either salaried workers or daily wage employees. Most accidents happened either in the morning or night hours. One more noticeable trend was that most crash victims were not using any safety equipment like seatbelts and helmets. It is important to promote responsible behavior among the population by positive reinforcement—sending out the right messages, targeting the right population groups. It can be done through the following:

  - Social media campaigns—to reach the younger population
  - Workplace campaigns—promoting the right behavior
  - Focus on geographies with high casualties (e.g., TV, radio campaigns)

- **Effective implementation of existing traffic rules and regulations**

It is important to inform the population about the law and against breaking traffic rules and implications thereof. There should be better traffic surveillance, both manual and automated, and stricter penalties for repeat offenders. While automated surveillance exists in Jordan (road cameras, traffic cameras, online fine payment platform, etc.), it is important to increase the number of cameras on different main roads, branch roads, and even village roads to capture any unlawful behaviors such as cutting through a red light, speeding, and aggressive driving.

2. Hospital level/facility recommendations

Currently at hospital level, RTI cases are not recorded or reported by the hospital authorities. Accident cases are recorded by accident representatives at the public hospitals and reported to PSD by the hospital staff or ambulance staff for private hospitals. It is not a requirement at the hospital level to record RTI cases. Public hospitals only report mass casualties to the Ministry of Health (the Hospital Administrative Department). After multiple conversations with the hospital staff, it was observed that they did not have an idea about the actual RTI cases admitted to the hospitals; the caseload was much lower than the number given to the hospital staff at the start of the study. Many patients decided to not get admitted due either to preference for private facilities or inability to pay the initial charges for admission. These patients are missed in the system and usually treated as trauma cases in other hospitals. It is crucial to understand the actual burden of RTIs at the hospital level to effectively plan for the services required to manage the cases. We propose the following solutions:

- **Set up an RTA registry to gather relevant RTI data**

  Establishing the RTA registry at the hospital level will allow us to capture relevant patient-level data around all RTIs. It will also help us track patient movements across health facilities. The registry shall be implemented in all public and private hospitals across the country. The registry would capture key details such as cause of crash, patient demographics, severity of injuries, hospital preference, key services availed, level of disability, etc. This would allow hospitals to understand the exact caseload of RTIs in the hospital and allow them to plan accordingly for required health services. If implemented across a larger pool, it would provide MOH and PSD to take evidence-based policy-level decisions and plan for RTI prevention and management. The registry can be hosted at the Ministry of Health and can have different access levels for the Ministry of Transportation, the Public Security Directorate, etc.

- **Making RTIs a notifiable condition**

  Currently an RTI is not reported by public or private hospitals to MOH unless it is a mass casualty, and then the hospital must report to the Hospital Administration Department at the MOH level. RTI numbers

are only shared with PSD departments on a case-by-case basis by hospitals, and aggregated numbers are shared with the central unit. There are no cumulative records of RTIs treated at the hospital level. There should be a standard format to record RTI cases in medical files at the hospital level to ensure RTI cases are tagged properly, and medical records can be pulled out, if needed. MOH shall develop a standard reporting format for recording and reporting RTIs on a regular basis and shift the dependency from the accident representative at the hospital to obtain RTI case information.

- **Training ER staff on managing/classifying and reporting RTA cases**

  It is important to standardize RTI case management and care across all facilities. Currently RTI cases are treated as trauma cases by the ER physicians, there is no common understanding across facilities and PSD on RTI classification and reporting. We recommend developing a training plan for all staff deployed in the ER dealing with RTI cases. Training shall be imparted on Standards Operating Protocols for RTI cases. It shall include the following:

  - Process of history-taking for RTI cases, capturing accident details along with medical history
  - Process to categorize all RTI cases as mild, moderate, or severe based on standard definitions
  - Process of medical recordkeeping for RTI cases—medical file tagging
  - Process of reporting RTI cases to PSD and MOH on a regular basis

3. System-/Policy-level recommendations

- **Reforming insurance and claims management for medico-legal cases allowing cashless payments at the health facilities**

  To alleviate the financial burden of RTIs on financially disadvantaged group, it is imperative to provide accessible and affordable care. A key challenge observed in this regard was the unavailability of cashless insurance claims for RTI patients under regular insurance coverage due to medico-legal status. It put cost burden of inpatient care and diagnostics on the patients themselves, especially if no third party was available to cover costs such as in hit-and-run cases or self-accidents. These patients mostly refused admission and left the hospital after initial emergency care. Below points can support RTI patients in financial managemgent while hospitalization;

  - Develop an interoperable system where insurance agencies, justice system, MOH, and hospitals coordinate with each other to settle reimbursements on patient's behalf. This will allow patients to avail of required services as per medical needs, making health care affordable.
  - Advocate for RTI to be covered under health insurance instead of third-party car insurance.
  - Establish a clear guideline for insurance companies to expedite coverage process for RTIs.

- **Development of clear guidelines and standard operating procedures (SOPs) for both public and private hospitals to manage and report RTI cases in the specified format**

  MOH shall work closely with PSD to come up with an efficient and effective way to correctly capture, manage, track, and report RTI cases at the hospital level. A key challenge observed at the hospital level was RTI patients coming in and posing as trauma cases to avail of insurance services. This leads to missed cases at the hospital level. Absence of clear guidelines to manage medical records and categorize RTI cases by hospital staff may lead to misreporting of numbers. MOH shall mandate hospitals to maintain the following records at the facility level regarding RTI:

  - Number of RTI cases received by the hospitals: outpatient department (OPD), ER, inpatient, referral, etc.
  - Number of RTI admissions: Name, age, gender, length of stay, services provided, severity level, treatment provided.
  - Retractable medical records for RTI cases: Medical records for RTI cases shall be tagged so they can be pulled out historically. Case history must include accident details.

SOPs and guidelines shall be developed around the following areas:

- RTI case-taking/history-taking
- RTI case categorization
- Medical recordkeeping for RTIs
- Case-reporting process to MOH and PSD: Format, frequency

- **Evidence-based planning of RTI services based on caseloads, types of patients, and accident patterns**

  During the study, key stakeholders highlighted that there is a need to align RTI services with demand areas. Currently RTI services and trauma centers are in the cities and urban areas, there is a need to conduct mapping of supply and demand of RTI trauma services. Some recommendations from key stakeholders were, as follows:

  - Conduct a need assessment study to identify need for RTI services in Jordan.
  - Establish trauma centers at the highways and peripheral areas next to road accident hotspots in Jordan with longer transfer time to hospitals.
  - Establish policies that focus on reducing the road accidents blackspots/hotspots by improving road infrastructure, enforcing better traffic surveillance in those areas (both manually and automatically).

- **Implementing the best-practice Safe System approach, which takes account of human error and tolerance to injury**

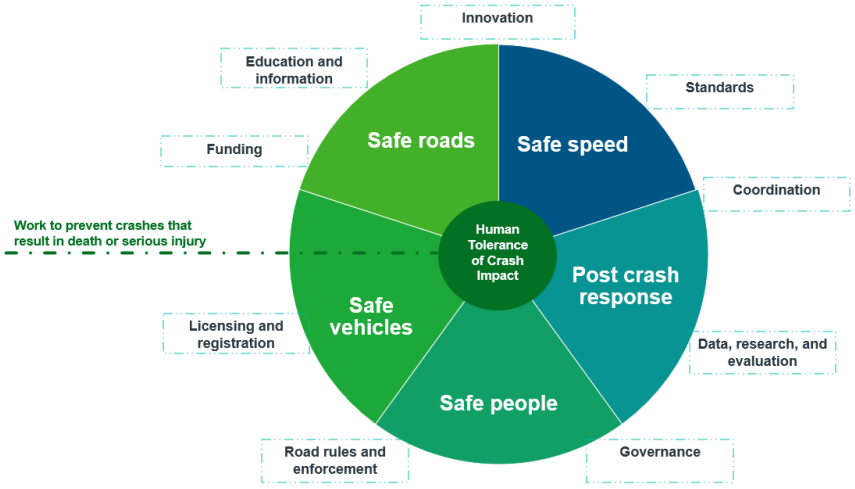
  The Safe System, a road safety approach, centers around prioritizing the human factor and operates on the premise that every instance of road fatality or severe injury can be avoided. Based on the Safe System approach, we recommend the following;

  - Safe System approach should be adopted by government agencies responsible for making RTA policies and regulations
  - Fast and efficient emergency medical help, diagnosis, and care for road traffic injuries.
  - Encouraging use of safer modes (such as the Bus Rapid Transit (BRT), which has dedicated roads) and safer routes for drivers and passengers
  - Regulatory bodies such as the Ministry of Transport should focus on safety conscious planning and proactive safety engineering design and providing crash protective roadsides

  Safe System incorporates established safety principles while incorporating innovative solutions and new technologies such as the use of camera technologies and providing proven driver assistance safety technologies in motor vehicles to help drivers abide by speeding limits and wear seat belts, and is gaining traction in Europe, Australasia, and North America at regional, national, and city levels.[19]

[19] https://www.pacts.org.uk/safe-system/.

Figure 69 - Safe System Principles



- **Prioritizing comprehensive research initiatives**

  To enhance our understanding of RTI in Jordan, it is imperative to prioritize comprehensive research initiatives. Below are some examples of studies that can be conducted:

  - Development of research studies on the evolving burden of RTIs over time can provide valuable insights in trends, contributing factors, and potential interventions.
  - Investigating the impact of transport strategy implementation and its effectiveness are crucial for refining and optimizing existing measures and strategy activities.
  - Assessment of socioeconomic costs associated with RTIs, on different levels (central [MOH], facility, and patient levels) and engaging different and a comprehensive list of stakeholders to obtain the data that are needed to implement such study.

By focusing on these studies, we can inform evidence-based policy decisions, enhance road safety interventions, and ultimately work toward mitigating the burden of road traffic accidents on both individual lives and the broader community.

- **Short-term interventions under the National Transport Strategy**

As the government of Jordan (GoJ) is preparing to launch the National Transport Strategy, ministries and entities involved can emphasize actionable road safety measures while awaiting the legislative adjustment; overall strategy development; and finalization of the planning, budgeting, and staffing for a comprehensive implementation of the National Transport Strategy (NTS). Short-term actions and recommendations under the effective implementation of the National Transport Strategy for the Ministry of Transport and different entities can include, but are not limited to, the following:

- **Ministry of Transport and Ministry of Public Works and Housing:** Prioritize road design, construction, and maintenance for the identified hotspots for car crashes attributed to road infrastructure. Implement speed management infrastructure, such as rumble strips and road bumps, on roads with elevated speed limits to enhance safety. Ensure roadway lighting on all highways, main roads, and branch roads (village roads).
- **Public Security Directorate**: Given that more than 70 percent of RTI locations are on main roads (60–80 km/hr speed limit), enforce surveillance measures such as radars and speed cameras, speed limit signs, variable speed limit signs, and traffic police checkpoints, to reduce RTIs.

- **Ministry of Health**: Promote public awareness on road safety, enhance emergency response plan and ER staff capacity-building for road crash injuries.
- **Governorate municipalities**: Greater Amman Municipality, as an example, should focus on the road crossing signs and crossable roads for pedestrians and staircases above roads to reduce pedestrian road traffic crashes.
- **Ministry of Interior**: Focus on capacity-building of different ministries and entities on road safety and initiate coordination mechanisms and communication channels.

Appendixes

Appendixes

Appendix A: Hospital Survey

1- Informed Consent

Project background: The World Bank with the support of the Ministry of Health is conducting a prospective, longitudinal observational study, the main aim of which is to assess the level of disability, factors influencing occurrence of road traffic injuries (RTIs), and costs associated with the RTIs in Jordan. IQVIA has been selected as an agency to conduct this study to understand the burden of road traffic injuries in Jordan.

The survey will take place in three hospitals: Al Bashir Hospital, Princess Basma Hospital, and Ma'an Hospital. The survey will be in three phases including at the time of discharge from the hospital, follow-up at one month after discharge, and the second follow-up three months after discharge. Follow-ups will be conducted over the phone inquiring on the patient condition and cost of treatment.

You have been identified as an eligible participant for this study. Your contributions to this study will help in understanding the impact of traffic crashes among the citizens in terms of physical trauma and financial burdens and identify the potential causes of such crashes. Results of this study will support MOH in improving health services around RTIs and also come up with policies to avoid RTIs in Jordan. Your responses during the study are highly valuable and will only be used for research purposes Your identity will be kept completely confidential. You have the right to refuse or not participate in the study.

Your rights as a participant are, as follows:

- All personal information identifying you will be kept confidential. IQVIA will maintain data confidentiality and respondent anonymity. Data collected will only be used for research purposes under this study.
- The respondent has the autonomy to refuse answering any of the questions.

Do you agree to participate in this survey? If yes, please fill the form below:

I, _____, give my permission to IQVIA to interview me for this survey.

I understand that this information is mainly for research purposes and will be used for aggregated reporting purposes to evaluate and improve road traffic injuries in Jordan. I understand that participation in this interview is optional.

I understand that any information collected will be carefully stored and treated with confidentiality and respect.

Name: Signature: Date:

2- General Patient Information

Self-filled by the data collector

Q1	Study/Form number (respondent number)	----------
Q2	Name of data collector and ID	Name: ---------- ID: ----------

Filled by data collector through patient's medical records and by interviewing the patient:

Q1	Medico-legal no.	----------
Q2	Registration/Inpatient no.	----------
Q3	Patient/Respondent ID	----------
Q4	Date arrived at hospital	_ _ / _ _ /_ _ (DD/MM/YYYY)
Q5	Time arrived (24 hrs)	_ _: _ _
Q6	If transferred from another facility	□ Yes □ No □ Unknown If yes, transferred from: ----------
Q7	ER patient	□ Yes □ No
Q8	Age (in years)	----------
Q9	Sex	□ Male □ Female
Q10	Number of total persons living in household	----------
Q11	Education level	□ No formal education/No schooling completed □ Primary school (grades 1–6) □ Secondary/High school (grades 7–12) □ College/University (bachelor's degree) □ Professional/Graduate (beyond bachelor's degree) □ Vocational/Technical □ Other (Specify): ----------
Q12	Employment status	□ Daily-wage laborer □ Keeping house/Homemaker □ Unable to work □ Unemployed □ Retired □ Beggar □ Military □ Salary worker □ Self-employed/Business (such as own your own business or farming) □ Student □ Other (Specify): ----------

Q13	Marital status	□ Never married □ Currently married □ Separated □ Divorced □ Widowed
Q14	Nationality	□ Jordanian □ Non-Jordanian
Q15	Type of coverage	□ Governmental health insurance (Ministry of Health/Royal Medical Services/University hospitals) □ Private/Corporate health insurance □ NGO insurance (UNRWA/UNHCR) □ No insurance

3- Prehospital Care

Q16	Was care provided at scene of injury?	□ Yes □ No □ Unknown
Q17	Who provided care? (Check all that apply) (MC) Clarify the difference between ambulance staff and EMT (emergency medical technicians)	□ Person involved □ Bystander □ Relative □ Friend □ Police □ Ambulance staff □ Emergency medical technician □ Unknown □ Other (Specify): ----------
Q18	What care was given at scene of injury? (check all that apply) (MC)	□ C-Spine immobilization (collar) □ Fracture immobilization □ Control of bleeding □ Wound care □ CPR □ IV fluids □ None □ Other (Specify): ----------
Q19	Mode of arrival to hospital	□ Walk-in □ Ambulance □ Taxi □ Car □ Motorized two-wheeler □ Other (Specify): ----------
Q20	Transport time to hospital (from time of injury)	□ 0–30 min □ >30 min–1 hr □ >1 hr–2 hrs

		□ >2–6 hours □ >6–24 hours □ >24 hours □ Other (Specify): ---------- □ Did not arrive to location immediately after injury—transferred later from another hospital/clinic

4- RTI Details *Filled by data collector by surveying the patient* (*or his/her proxy*)

Q21	Date of injury	_ _ / _ _ /_ _ (DD/MM/YYYY)
Q22	Time of injury (24 hr)	_ _: _ _
Q23	Location (district) of RTI:	City: --------- Nearby city: --------- Other (Specify): ----------
Q24	Name the street/intersection/specific location of crash	----------
Q25	Type of road	□ Highway □ Main road □ Side street □ Village road □ Other (Specify): ----------
Q26	Type of road user	□ Pedestrian □ Driver (includes cyclists) □ Passenger □ Other (Specify): ----------
Q27	If answer to Q26 is not pedestrian: Type of vehicle patient was traveling in at time of injury	□ Car □ Minibus/Van □ Bus □ Bicycle □ Motorcycle □ Truck/Lorry □ Other (Specify): ----------
Q28	If answer to Q26 is not passenger: Mobile phone use at time of injury	□ Yes □ No
Q29	If answer to Q26 is pedestrian: If road user is a pedestrian, were they injured while	□ Boarding/Exiting bus □ Boarding/Exiting another vehicle □ Standing/Walking on side of road □ Crossing the road

Q30	Counterpart (what was struck/struck by?)	□ Car □ Minibus/Van □ Bus □ Animal □ Motorcycle □ Bicycle □ Nonmotorized vehicles □ Truck/Lorry □ Skid/Rollover (noncollision) □ Fall from moving vehicle □ Stationary/Fixed object □ Other (Specify): ----------
Q31	Safety equipment used	□ Seatbelt □ Child seat □ Helmet □ None □ Unknown
Q32	What do you think were the factors leading to the RTA?	□ Weather conditions □ Light conditions □ Road infrastructure □ Vehicle speed □ Mobile use □ Alcohol use □ Unknown □ Other (Specify): ----------

5- **Patient Care—Initial Assessment** *Filled by data collector with information retrieved from medical records (to be completed for patients in ER, and for patients in other wards as fully as possible)*

Q33	Dead on arrival	□ Yes □ No □ Unknown If Yes: go to last question—signature of data collector
Q34	Initial vital signs	999 if not assessed
Q34a	SBP (systolic blood pressure): Normal range: 90–120	----------
Q34b	DBP (diastolic blood pressure) Normal range: 60–80	----------
Q34c	Pulse rate Normal range: 60–90	----------
Q34d	Respiratory rate Normal range: 12–18	----------
Q35	Initial Glasgow Coma Scale (GCS)	
Q35a	Eyes opening	□ Spontaneous (4) □ To Voice (3) □ To Pain (2) □ None (1)

		□ Unknown (examination not done)
Q35b	Verbal response	□ Oriented (5) □ Confused (4) □ Inappropriate (3) □ Incomprehensible (2) □ None (1) □ Unknown (Examination not done)
Q35c	Motor response	□ Obeys commands (6) □ Localizes to pain (5) □ Withdraws from pain (4) □ Flexes (3) □ Extends (2) □ None (1) □ Unknown (examination not done)
Q36	Did the patient lose consciousness (LOC)?	□ Yes □ No □ Unknown (Not available in medical records)
Q37	Confirmed or suspected alcohol use within 6 hours prior to time of injury	□ Yes □ No □ Unknown (Only if cannot ask patient)
Q38	Confirmed or suspected other substance use within 6 hours prior to time of injury	□ Yes □ No □ Unknown (Only if cannot ask patient)
Q39	**Treatment given in Emergency Department (casualty):** *Skip if patient was not admitted to ER*	
Q39a	Oxygen administered	□ Yes □ No □ Unknown if administered
Q39b	IV fluids administered	□ Yes □ No □ Unknown if administered
Q39c	Blood products given	□ Yes □ No □ Unknown if administered If yes: No. of units: ----------
Q39d	Colloid solution given	□ Yes □ No □ Unknown if administered (e.g., Haemacel)
Q39e	Analgesia administered	□ Yes □ No □ Unknown if administered
Q39f	Intubation/Ventilation	□ Yes □ No □ Unknown if administered

Q40	First injury region	□ Head & Neck □ Face □ Chest □ Abdomen/Pelvis □ Extremities □ External
Q41a	Anatomy	**Head & Neck** □ Brain □ Skull □ Neck □ Cervical vertebrae **Face** □ Eye(s) □ Nose □ Mouth □ Ear □ Facial bones **Chest** □ Thoracic spine □ Rib cage □ Diaphragm □ Chest organs **Abdomen/Pelvis** □ Lumber spine □ Abdominal organs **Extremities** □ Pelvic girdle □ Shoulder girdle □ Upper extremities □ Lower extremities **External** □ Skin □ Lacerations, abrasions, and burns □ Other: ----------
Q41b	Pathology	□ None □ Concussion □ Epidural hematoma (EDH) □ Subdural hematoma (SDH) □ Subarachnoid hematoma (SAH) □ Abrasion/Soft Tissue Injury (STI) □ Closed tissue □ Laceration-superficial □ Dislocation □ Fracture-closed □ Fracture-open □ Hemothorax □ Pneumothorax □ Contusion

		□ Paralysis (with) □ Crush injury □ Degloving injury □ Burns (percent)
Q41c	Treatment	□ Operation □ No treatment □ Observation □ Antibiotics □ Dressing/Plaster □ Sutures/Stitches □ ORIF □ Chest tube
Q41d	Operation	□ Internal fixation □ External fixation □ Laparotomy □ Amputation □ Thoracotomy □ Craniotomy □ Other: ----------
Q41e	Date	_ _ / _ _ /_ _ (DD/MM/YYYY)
Q41f	Time (24 hrs)	_ _: _ _
Q42	**Second injury region**	□ Head & Neck □ Face □ Chest □ Abdomen/Pelvis □ Extremities □ External
Q42a	Anatomy	**Head & Neck** □ Brain □ Skull □ Neck □ Cervical vertebrae **Face** □ Eye(s) □ Nose □ Mouth □ Ear □ Facial bones **Chest** □ Thoracic spine □ Rib cage □ Diaphragm □ Chest organs **Abdomen/Pelvis** □ Lumber spine □ Abdominal organs **Extremities** □ Pelvic girdle

		□ Shoulder girdle □ Upper extremities □ Lower extremities **External** □ Skin □ Lacerations, abrasions, and burns □ Other: ----------
Q42b	Pathology	□ None □ Concussion □ Epidural hematoma (EDH) □ Subdural hematoma (SDH) □ Subarachnoid hematoma (SAH) □ Abrasion/Soft Tissue Injury (STI) □ Closed tissue □ Laceration-superficial □ Dislocation □ Fracture-closed □ Fracture-open □ Hemothorax □ Pneumothorax □ Contusion □ Paralysis (with) □ Crush Injury □ Degloving injury □ Burns (%)
Q42c	Treatment	□ Operation □ No treatment □ Observation □ Antibiotics □ Dressing/Plaster □ Sutures/Stitches □ ORIF □ Chest tube
Q42d	Operation	□ Internal fixation □ External fixation □ Laparotomy □ Amputation □ Thoracotomy □ Craniotomy □ Other: ----------
Q42e	Date	_ _ / _ _ /_ _ (DD/MM/YYYY)
Q42f	Time (24 hrs)	_ _: _ _
Q43	**Third Injury**	□ Head & Neck □ Face □ Chest □ Abdomen/Pelvis □ Extremities □ External

Q43a	Anatomy	**Head & Neck** □ Brain □ Skull □ Neck □ Cervical vertebrae **Face** □ Eye(s) □ Nose □ Mouth □ Ear □ Facial bones **Chest** □ Thoracic spine □ Rib cage □ Diaphragm □ Chest organs **Abdomen/ pelvis** □ Lumber spine □ Abdominal organs **Extremities** □ Pelvic girdle □ Shoulder girdle □ Upper extremities □ Lower extremities **External** □ Skin □ Lacerations, abrasions, and burns □ Other: ----------
Q43b	Pathology	□ None □ Concussion □ Epidural hematoma (EDH) □ Subdural hematoma (SDH) □ Subarachnoid hematoma (SAH) □ Abrasion/Soft Tissue Injury (STI) □ Closed tissue □ Laceration-superficial □ Dislocation □ Fracture-closed □ Fracture-open □ Hemothorax □ Pneumothorax □ Contusion □ Paralysis (with) □ Crush Injury □ Degloving injury □ Burns (%)
Q43c	Treatment	□ Operation □ No treatment

		□ Observation □ Antibiotics □ Dressing/Plaster □ Sutures/Stitches □ ORIF □ Chest tube
Q43d	Operation	□ Internal fixation □ External fixation □ Laparotomy □ Amputation □ Thoracotomy □ Craniotomy □ Other: ----------
Q43e	Date	_ _ / _ _ /_ _ (DD/MM/YYYY)
Q43f	Time (24 hrs)	_ _: _ _
Q44	ICU stay	□ Yes □ No If Yes: Number of days: ----------
Q45	Disposition, casualty	□ Died in hospital (ER/Casualty) □ Admitted to inpatient ward □ Treated and discharged (from ER/Casualty) □ Absconded/Left against medical advice □ Transferred to other hospital (Specify)
Q46	If Q45 is admitted to inpatient ward: If admitted, final disposition	□ Died in hospital (Inpatient) □ Discharged home □ Discharged to rehabilitation □ Absconded/Left against medical advice □ Transferred to other hospital (Specify)

6- **Payment Information** *Filled by data collector by surveying the patient* (*or his/her proxy*)

Q47	Did you/the injured person pay a fee when you arrived at the hospital?	□ Yes □ No
Q47a	If yes, how much did you/the injured person pay?	Amount (JOD): ----------
Q48	What was the payment for (check all that apply)? (MC)	□ Registration □ Medicine □ X-rays □ Laboratory tests □ Blood transfusion

		□ MRI □ CT □ USD □ Blood tests □ Other (Specify): ----------
Q49	In total, including payments made in the ER, how much did this hospitalization cost?	Amount (JOD): ----------
Q50	How were you/the injured person able to pay for this total hospitalization cost?	□ Had money of his/her own □ Borrowed from family/friends □ Took a loan □ Sold assets □ Insurance (any type) □ Other (Specify): ----------
Q51	What is the total annual income of your (injured person) household from all sources?	Amount (JOD): ----------

7- Disability History

Q52	**Did you have a disability before the road traffic injury?** *Disabilities can be impairments or problems in body function or alterations in body structure (e.g., paralysis or blindness); activity limitations or difficulties in executing activities (e.g., walking or eating); or participation restrictions or problems with involvement in any area of life (e.g., facing discrimination in employment or transportation).*	□ No impairment □ Mild □ Moderate □ Severe □ Extreme
	• *Mild disability means a problem that is present less than 25% of the time, with an intensity a person can tolerate, and which happened rarely over the last 30 days.* • *Moderate disability means a problem that is present less than 50% of the time, with an intensity that is interfering in the person's day-to-day life and which happened occasionally over the last 30 days.* • *Severe disability means that a problem is present more than 50% of the time, with an intensity that is partially disrupting the person's day-to-day life, and which happened frequently over the last 30 days.* • *Complete disability means a problem that is present more than 95% of the time, with an intensity that is totally disrupting the person's day-to-day life, and which happened every day over the last 30 days.*	
Q53	Which of these area(s) do you have challenges because of your disability (disability not related to this road traffic injury?	□ Learning and applying knowledge (understanding and communicating) □ Managing tasks and demands □ Mobility (moving and maintaining body positions, handling and moving objects, moving around in the environment, moving around using transportation, getting around)

		□ Managing self-care tasks (self-care) □ Managing domestic life (life activities) □ Establishing and managing interpersonal relationships and interactions (getting along with people) □ Engaging in major life areas (education, employment, managing money or finances—life activities) □ Engaging in community, social, and civic life (participation in society)
Q54	We would like to follow up with you after discharge to inquire about any disability/disability you might experience due to this road traffic injury. Do we have your permission to contact you after your discharge from XX hospital? Our team would like to contact you at one month and three months after your discharge. You can withdraw your permission at any time.	□ Yes □ No
Q55	What is the preferred phone number(s) to reach you? (To be recorded in the Data Collection Tracking Sheet)	Phone number: ----------

Self-filled by the data collector

Q1	Date of discharge (or death) from hospital	_ _ / _ _ / _ _ (DD/MM/YYYY)
Q2	Time of discharge (or death) from hospital (24 hrs)	_ _ : _ _
Q3	Signature (initials if online form) of data collector	----------

Appendix B: Follow-Up Survey Tools (Version 3)

Protocol for Follow-up Data Collection (One-month follow-up call, three-month follow-up call after hospital discharge)

Self-filled by the data collector

Q1	Patient/Respondent ID number	----------
Q2	Name of data collector and ID	Name: ---------- ID number: ----------
Q3	Assessment timepoint	□ One-month follow-up □ Three-month follow-up
Q4	Interview date	_ _ / _ _ /_ _ (DD/MM/YYYY)
Q5	Facility name (Where treatment/follow-up is going on)	----------
Q6	Facility location (Where treatment/Follow-up is going on)	----------
Q7	Respondent	□ RTI victim only □ RTI victim with assistance from caregiver □ Caregiver (Proxy)

1- Consent

SAY TO RESPONDENT:

My name is _____. I am speaking with you on behalf of the IQVIAs data collection team about the study funded by the World Bank on road safety as a follow-up from our face-to-face encounter at hospital XXX. This is a first follow-up call (30 days after your discharge) to understand how you are progressing from your injury. Would this be a good time to speak to you?

The information that you provide in this interview is confidential and will be used only for research. May I begin asking questions?

□ Yes

□ No

[If no], SAY TO RESPONDENT: “Thank you for your time. Ask for rescheduling the call.”

[If yes]:

Q1	How old are you now?	----------
Q2	What is you sex?	□ Male □ Female

SAY TO RESPONDENT: The interview is about difficulties you may have because of your injury from the road traffic crash. When I ask you about difficulties in doing an activity think about

• Increased effort
• Discomfort or pain
• Slowness
• Changes in the way you do the activity

When answering, I’d like you to think back since the last interview. I also would like you to answer these questions thinking about how much difficulty you have on average since the last interview, while doing the activity as you usually do it.

1- Module A – World Health Organization Disability Assessment Survey II (WHO DAS 2.0)

Ask at one and three months

Q1	Since the last interview, how much difficulty did you have in standing for long periods such as 30 minutes? If respondents report that they have not walked this distance in the past 30 days, interviewers should ask whether this is due to a health condition. If respondents report that lack of walking is due to a health condition/injury, then code the item "Extreme or cannot do." If respondents report that the lack of walking is not due to a health condition, then code the item "N/A" for "Not applicable."	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q2	Since the last interview, how much difficulty did you have in taking care of your household responsibilities?	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q3	Since the last interview, how much difficulty did you have in learning a new task, for example, learning how to get to a new place?	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q4	Since the last interview, how much difficulty did you have in joining in community activities (for example, festivities, religious or other activities) in the same way as anyone else can?	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q5	How much have you been emotionally affected by your health problems?	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q6	Since the last interview, how much difficulty did you have in concentrating on doing something for 10 minutes?	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q7	Since the last interview, how much difficulty did you have in walking a long distance such as a kilometer [or equivalent]?	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q8	Since the last interview, how much difficulty did you have in washing your whole body?	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3)

		□ Extreme difficulty or cannot do (4) □ Not applicable
Q9	Since the last interview, how much difficulty did you have in getting dressed?	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q10	Since the last interview, how much difficulty did you have in dealing with people you do not know?	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q11	Since the last interview, how much difficulty did you have in maintaining a friendship?	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q12	Since the last interview, how much difficulty did you have in your day-to-day work/school?	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q13	Overall, since the last interview how many days were these difficulties present?	----------
Q14	Since the last interview, for how many days were you totally unable to carry out your usual activities or work because of any health condition?	----------
Q15	Since the last interview, not counting the days that you were totally unable, for how many days did you cut back or reduce your usual activities or work because of any health condition?	----------

2- Module B – Assistive Devices and Return to Usual Activities

Q1	As of today, do you consider yourself to have returned to your normal life or doing your usual activities	□ Yes □ No □ Don't know If Yes: As of today, have you returned to work since your injury? □ Yes □ No □ Not applicable (Was not working before injury)
Q2	Are you currently using personal equipment, special adapted devices, and or physical modifications to your home, to assist you with your everyday activities? Examples might include hearing aids, eyeglasses,	□ Yes □ No □ Don't know

	wheelchairs, computer or electrical assistive devices, devices that extend reach, or adding a ramp or grab bar.	
Q2a	If answer to Q2 is Yes: Which ones? READ ALOUD and check all that apply:	□ Mobility aids such as wheelchairs, scooters, walkers, canes, crutches, prostheses, and orthotic devices □ Hearing aids □ Visual aids such as glasses and magnifiers □ Communication aids including specialized computer software and hardware □ Cognitive aids including computer or electrical assistive devices, to help with memory, attention, or other challenges in thinking skills □ Physical modifications in the built environment including ramps, handle rails, grab bars, and wider doorways □ Devices and features of devices to help you perform tasks such as cooking, dressing, and grooming (examples include specialized handles and grips, devices that extend reach, and lights on telephones and doorbells) □ Other (please specify): ---------- for example, adaptive switches and utensils to help you eat or accomplish other activities or tools to help with educational activities like automatic page turners, book holders, and adapted pencil grips
Q2b	If answer to Q2 is No: Do you need any assistive equipment, devices, or modification?	□ Yes □ No □ Don't know

3- Module C – Costs and Burden on Household Members (One Month)

SAY TO RESPONDENT: Now I would like to ask you a few questions about your expenses for medical treatment. This is part of a broader assessment of health care costs, including costs paid for by the government, for example, they are aimed at getting a picture of the cost of road traffic injury for society. I would like to remind you that this information will be treated strictly confidential.

Q1	In the last 30 days, did you receive follow-up medical care due to an RTI since your discharge from hospital? Please specify and indicate the amount you paid for this.	□ Inpatient care (patient got hospitalized again because of RTI) Amount (JOD): --------- □ Policlinical hospital visits

		Amount (JOD): --------- □ General practitioner/clinic Amount (JOD): --------- □ Laboratory tests and diagnostics Amount (JOD): --------- □ Medicines Amount (JOD): --------- □ Physiotherapy/Rehabilitation Amount (JOD): --------- □ Psychological care Amount (JOD): --------- □ Home care Amount (JOD): --------- □ Other (Specify) ------ Amount (JOD): --------- If inpatient care/hospitalized is selected: Name of hospital: --------- Date of admission: _ _ / _ _ /_ (DD/MM/YYYY)

		Length of stay: ---------
Q2	How much did you pay for personal equipment or special adapted devices, if any (mobility/hearing/visual aids/communication/cognitive aids)?	Amount (JOD): ---------
Q3	How much did you pay for physical modifications to your home, if any (e.g., ramps; handle rails; grab bars; wider doorways; devices to help you perform tasks such as cooking, dressing, and grooming)?	Amount (JOD): ---------
Q4	How were you able to pay for the costs related to your injury (both medical costs occurring directly after the injury and follow-up costs)?	□ Had money myself □ Family/Friends paid (part of) the costs □ Borrowed from family/friends □ Took a loan □ Sold assets □ Insurance (any type) □ Other (Specify)
Q5a	If Insurance was selected in previous question Q4, or Q50 of hospital survey (How were you/the injured person able to pay for this total hospitalization cost)? Which costs were (partly) paid by your insurance company (for both initial RTI hospitalization and follow-up costs)?	□ Transportation to/from hospital □ Emergency Room treatment □ Hospital admission □ Medicines □ Mobility aids □ Policlinical follow-up hospital visits □ General practitioner/clinic □ Physiotherapy/Rehabilitation □ Psychological care □ Home care

		□ Personal equipment or special adapted devices □ Physical modifications to your home

SAY TO RESPONDENT: Thank you for taking the time to answer these questions.

For one-month follow-up, **SAY TO RESPONDENT**: "We will call you in two months for follow-up. Goodbye."

For three-month follow-up, **SAY TO RESPONDENT**: "I now have a few more questions to ask you about factors in your environment that might affect your ability to do your usual activities. This will take between 5 and 10 minutes. May I proceed?"

If [yes]. Continue with Module C

If [no], SAY TO RESPONDENT: "Thank you for your time. Goodbye."

Three-Month Follow-Up

Self-filled by the data collector

Q1	Patient/Respondent ID number:	----------
Q2	Name of data collector and ID	Name: ---------- ID Number: ----------
Q3	Assessment timepoint	□ One-month follow-up □ Three-month follow-up
Q4	Interview date	_ _ / _ _ /_ _ (DD/MM/YYYY)
Q5	Facility name (Where treatment/follow-up is going on)	----------
Q6	Facility location (Where treatment/follow-up is going on)	----------
Q7	Respondent	□ RTI victim only □ RTI victim with assistance from caregiver □ Caregiver (Proxy)

2- Consent

SAY TO RESPONDENT:

My name is _____. I am speaking with you on behalf of the IQVIAs data collection team about the study funded by the World Bank on road safety as a follow-up from our face-to-face encounter at hospital XXX. This is a second follow-up (three months after discharge), I am calling to understand how you are progressing from your injury. Would this be a good time to speak to you?

The information that you provide in this interview is confidential and will be used only for research. May I begin asking questions?

□ Yes

□ No

[If no], SAY TO RESPONDENT: "Thank you for your time. Ask for rescheduling the call."

[If yes]:

Q1	How old are you now?	----------
Q2	What is you sex?	□ Male □ Female

SAY TO RESPONDENT: The interview is about difficulties you may have because of your injury from the road traffic crash. When I ask you about difficulties in doing an activity think about
• Increased effort
• Discomfort or pain
• Slowness
• Changes in the way you do the activity
When answering, I'd like you to think back since the last interview. I also would like you to answer these questions thinking about how much difficulty you have on average since the last interview, while doing the activity as you usually do it.

4- Module A – World Health Organization Disability Assessment Survey II (WHO DAS 2.0)

Ask at one and three months

Q1	Since the last interview, how much difficulty did you have in **standing for long periods, such as 30 minutes?** If respondents report that they have not walked this distance in the past 30 days, interviewers should ask whether this is due to a health condition. If respondents report that lack of walking is due to a health condition/injury, then code the item "Extreme or cannot do." If respondents report that the lack of walking is not due to a health condition, then code the item "N/A" for "Not applicable."	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q2	Since the last interview, how much difficulty did you have in **taking care of your household responsibilities?**	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q3	Since the last interview, how much difficulty did you have in **learning a new task, for example, learning how to get to a new place?**	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q4	Since the last interview, how much difficulty did you have in **joining in community activities (for example, festivities, religious or other activities) in the same way as anyone else can?**	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q5	How much have you been **emotionally affected by your health problems?**	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q6	Since the last interview, how much difficulty did you have in **concentrating on doing something for 10 minutes?**	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable

Q7	Since the last interview, how much difficulty did you have in **walking a long distance such as a kilometer [or equivalent]?**	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q8	Since the last interview, how much difficulty did you have in **washing your whole body?**	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q9	Since the last interview, how much difficulty did you have in **getting dressed?**	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q10	Since the last interview, how much difficulty did you have in **dealing with people you do not know?**	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q11	Since the last interview, how much difficulty did you have in **maintaining a friendship?**	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q12	Since the last interview, how much difficulty did you have in **your day-to-day work/school?**	□ No difficulty (0) □ Mild difficulty (1) □ Moderate difficulty (2) □ Severe difficulty (3) □ Extreme difficulty or cannot do (4) □ Not applicable
Q13	Overall, since the last interview, for how many days were these difficulties present?	----------
Q14	Since the last interview, for how many days were you totally unable to carry out your usual activities or work because of any health condition?	----------
Q15	Since the last interview, not counting the days that you were totally unable, for how many days did you cut back or reduce your usual activities or work because of any health condition?	----------

5- MODULE B – Assistive Devices and Return to Usual Activities

Q1	As of today, do you consider yourself to have returned to your normal life or doing your usual activities?	□ Yes □ No □ Don't know If Yes: As of today, have you returned to work since your injury?

		□ Yes □ No □ Not applicable (Was not working before injury)
Q2	Are you currently using personal equipment, special adapted devices, and/or physical modifications to your home, to assist you with your everyday activities? Examples might include hearing aids, eyeglasses, wheelchairs, computer or electrical assistive devices, devices that extend reach, or adding a ramp or grab bar.	□ Yes □ No □ Don't know
Q2a	If answer to Q2 is Yes: Which ones? READ ALOUD and check all that apply:	□ Mobility aids, such as wheelchairs, scooters, walkers, canes, crutches, prostheses, and orthotic devices □ Hearing aids □ Visual aids such as glasses and magnifiers □ Communication aids including specialized computer software and hardware □ Cognitive aids including computer or electrical assistive devices, to help with memory, attention, or other challenges in thinking skills □ Physical modifications in the built environment including ramps, handle rails, grab bars, and wider doorways □ Devices and features of devices to help you perform tasks such as cooking, dressing, and grooming; (examples include specialized handles and grips, devices that extend reach, and lights on telephones and doorbells) □ Other (please specify): ---------- for example, adaptive switches and utensils to help you eat or accomplish other activities or tools to help with educational activities like automatic page turners, book holders, and adapted pencil grips
Q2b	If answer to Q2 is No: Do you need any assistive equipment, devices, or modification?	□ Yes □ No □ Don't know

6- Module C – Costs and Burden on Household Members (One Month)

SAY TO RESPONDENT: Now I would like to ask you a few questions about your expenses for medical treatment. This is part of a broader assessment of health care costs, including costs paid for by the government, for example, aimed at getting a picture of the cost of road traffic injury for society. I would like to remind you that this information will be treated as strictly confidential.

Q1	In the last 30 days, did you receive follow-up medical care due to an RTI since your discharge from hospital? Please specify and indicate the amount you paid for this.	□ Inpatient care (patient got hospitalized again because of RTI) Amount (JOD): --------- □ Policlinical hospital visits Amount (JOD): --------- □ General practitioner/clinic Amount (JOD): --------- □ Laboratory tests and diagnostics Amount (JOD): --------- □ Medicines Amount (JOD): --------- □ Physiotherapy/Rehabilitation Amount (JOD): --------- □ Psychological care Amount (JOD): --------- □ Home care Amount (JOD): --------- □ Other (Specify): ------ Amount (JOD): --------- If inpatient care/hospitalized is selected: Name of hospital: --------- Date of admission: _ _ / _ _ /_ (DD/MM/YYYY) Length of stay: ---------
Q2	How much did you pay for personal equipment or special adapted devices, if any (mobility/hearing/visual aids/communication/cognitive aids)?	Amount (JOD): ---------
Q3	How much did you pay for physical modifications to your home, if any (e.g., ramps: handle rails; grab bars; wider doorways; devices to help you perform tasks such as cooking, dressing, and grooming)?	Amount (JOD): ---------
Q4	How were you able to pay for the costs related to your injury (both medical costs occurring directly after the injury and follow-up costs)?	□ Had money myself □ Family/Friends paid (part of) the costs

		□ Borrowed from family/friends □ Took a loan □ Sold assets □ Insurance (any type) □ Other (Specify)
Q5a	If Insurance was selected in previous question Q4, or Q50 of hospital survey (How were you/the injured person able to pay for this total hospitalization cost)? Which costs were (partly) paid by your insurance company (for both initial RTI hospitalization and follow-up costs)?	□ Transportation to/from hospital □ Emergency Room treatment □ Hospital admission □ Medicines □ Mobility aids □ Polyclinical follow-up hospital visits □ General practitioner/clinic □ Physiotherapy/Rehabilitation □ Psychological care □ Home care □ Personal equipment or special adapted devices □ Physical modifications to your home

7- Module D – Craig Hospital Inventory of Environmental Factors—Ask at three-month follow-up

SAY TO RESPONDENT: Being an active, productive member of society includes participating in such things as working, going to school, taking care of your home, and being involved with family and friends in social, recreational, and civic activities in the community. Many factors can help or improve a person's participation in these activities while other factors can act as barriers and limit participation.

Note: If a question asks specifically about school or work and the respondent neither attends school nor works, check "not applicable."

Q1	Do you think you have the same opportunities as other people to participate in and take advantage of **education?**	□ Yes □ No □ Don't know □ Not applicable
Q2	Do you think you have the same opportunities as other people to participate in and take advantage of **employment?**	□ Yes □ No □ Don't know □ Not applicable
Q3	Do you think you have the same opportunities as other people to participate in and take advantage of **recreation/leisure?**	□ Yes □ No □ Don't know □ Not applicable

Now, please tell me how often each of the following has been a barrier to your own participation in the activities that matter to you. Think about the time since your injury and tell me whether each item I am going to ask you about now has been a problem **daily, weekly, monthly, less than monthly, or never.** If the item occurs, I will ask you a follow-up question as to how big a problem the item is with regard to your participation in the activities that matter to you.

Q4	Since your injury, how often has **the availability of transportation** been a problem for you?	□ Daily □ Weekly □ Monthly □ Less than monthly □ Never □ Not applicable

Q4a	[If NOT “never” or “N/A”] When this problem occurs, has it been a big problem or a little problem?	□ Big problem □ Little problem
Q5	Since your injury, how often has the **information you wanted or needed** not been available in a format you can use or understand?	□ Daily □ Weekly □ Monthly □ Less than monthly □ Never □ Not applicable
Q5a	[If NOT “never” or “N/A”] When this problem occurs, has it been a big problem or a little problem?	□ Big problem □ Little problem
Q6	Since your injury, how often has the **availability of health care services and medical care** been a problem for you? [If NOT “never” or “N/A”] When this problem occurs, has it been a big problem or a little problem?	□ Daily □ Weekly □ Monthly □ Less than monthly □ Never □ Not applicable
Q6a	[If NOT “never” or “N/A”] When this problem occurs, has it been a big problem or a little problem?	□ Big problem □ Little problem
Q7	Since your injury, how often have **other people’s attitudes toward you** been a problem **at home**?	□ Daily □ Weekly □ Monthly □ Less than monthly □ Never □ Not applicable
Q7a	[If NOT “never” or “N/A”] When this problem occurs, has it been a big problem or a little problem?	□ Big problem □ Little problem
Q8	Since your injury, how often **did you need someone else’s help** at home and could not get it easily?	□ Daily □ Weekly □ Monthly □ Less than monthly □ Never □ Not applicable
Q8a	[If NOT “never” or “N/A”] When this problem occurs, has it been a big problem or a little problem?	□ Big problem □ Little problem
Q9	Since your injury, how often did you experience **prejudice and discrimination**?	□ Daily □ Weekly □ Monthly □ Less than monthly □ Never □ Not applicable
Q9a	[If NOT “never” or “N/A”] When this problem occurs, has it been a big problem or a little problem?	□ Big problem □ Little problem
Q10	Since your injury, how often have **other people’s attitudes toward you** been a problem at school or work? *(N/A would be an answer if respondent has not attended school or work)*	□ Daily □ Weekly □ Monthly □ Less than monthly □ Never □ Not applicable

Q10a	[If NOT “never” or “N/A”] When this problem occurs, has it been a big problem or a little problem?	□ Big problem □ Little problem
Q11	Since your injury, how often **did you need someone else’s help** at school or work and could not get it easily? *(N/A would be an answer if respondent has not attended school or work)*	□ Daily □ Weekly □ Monthly □ Less than monthly □ Never □ Not applicable
Q11a	[If NOT “never” or “N/A”] When this problem occurs, has it been a big problem or a little problem?	□ Big problem □ Little problem
Q12	Since your injury, how often did **government programs and policies** make it difficult to do what you want or need to do?	□ Daily □ Weekly □ Monthly □ Less than monthly □ Never □ Not applicable
Q12a	[If NOT “never” or “N/A”] When this problem occurs, has it been a big problem or a little problem?	□ Big problem □ Little problem
Q13	Since your injury, how often did **the policies and rules of business and organizations** make problems for you?	□ Daily □ Weekly □ Monthly □ Less than monthly □ Never □ Not applicable
Q13a	[If NOT “never” or “N/A”] When this problem occurs, has it been a big problem or a little problem?	□ Big problem □ Little problem
Q14	Since your injury, how often has the **natural environment (temperature, terrain, climate, etc.)** made it difficult to do what you want or need to do?	□ Daily □ Weekly □ Monthly □ Less than monthly □ Never □ Not applicable
Q14a	[If NOT “never” or “N/A”] When this problem occurs, has it been a big problem or a little problem?	□ Big problem □ Little problem
Q15	Since your injury, how often have **other aspects of your surroundings—lighting, noise, crowds, etc.—made it difficult** to do what you want or need to do?	□ Daily □ Weekly □ Monthly □ Less than monthly □ Never □ Not applicable
Q15a	[If NOT “never” or “N/A”] When this problem occurs, has it been a big problem or a little problem?	□ Big problem □ Little problem

Appendix C: Discussion Guides

Discussion guide	Line of inquiry
1. Ministry of Health Representatives Discussion Guide	• Roles and responsibilities of individual and the Ministry of Health in relation to road traffic injuries • RTI burden, trends, & factors; availability of health care services; collaboration with other stakeholders • Track and monitor RTIs, data collection, and available reports and reporting structure • Disability and health care costs • Policies, initiatives, challenges, and recommendations
2. Hospital Administrators Discussion Guide	• Roles and responsibilities of individual and the hospital in relation to road traffic injuries • Processes and procedures followed to treat, manage, and report RTI cases • RTI burden, trends, factors, and prehospital care • Hospital capacity and financial burden on the hospital • Data surveillance and monitoring, challenges and recommendations
3. Insurance Company Discussion Guide	• Roles and responsibilities of individual and the insurance in relation to road traffic injuries, insurance types provided by the company • Insurance coverage for RTIs • Number and types of claims and reporting • Disability and health care costs, collaborations, challenges, and recommendations
4. Trauma Care Physicians/ Nurses Discussion Guide	• Roles and responsibilities of individual and the hospital in relation to road traffic injuries and services provided • Common RTI patient profile, injuries, factors, rehabilitation and disability, severity and distribution • Clinical services availability and affordability • RTI reporting and monitoring • Challenges and recommendations
5. Road Traffic Authority/Jordan Traffic Institute Discussion Guide	• Roles and responsibilities of individual and the institute/department in relation to road traffic injuries • Current road safety policies and regulations in place, investigating and reporting • Road infrastructure, prehospital care, and health care services • Surveillance, monitoring, data collection, and reporting • Challenges and recommendations

Appendix D: Trainings

Date of training	Type of training	Outcomes	Participant information
June 5, 2023	Mix – Face-to-Face (IQVIA Offices)/Virtual (MS teams)	Trained field supervisors on how to conduct the Hospital Patient Survey; how to train the hospital staff on how to conduct the Hospital Patient Survey, study protocols, ethical procedures, tracking sheets; and trained on using the Survey Solutions for the Hospital Patient Survey	- Number of total participants: 6 - Number of female participants: 3 - Number of researchers, data managers, and research users trained: 2 - Number of government agency officials trained: 0
June 6, 2023	Face-to-Face (Al Bashir Hospital)	Trained hospital staff on how to conduct and fill out the Hospital Patient Survey, study protocols, inclusion criteria, and an overall discussion on the goals and objectives of the project	- Number of total participants: 10 - Number of female participants: 4 - Number of researchers, data managers, and research users trained: 6 - Number of government agency officials trained: 6
June 7, 2023	Face-to-Face (Princess Basma Hospital)	Trained hospital staff on how to conduct and fill out the Hospital Patient Survey, study protocols, inclusion criteria, and an overall discussion on the goals and objectives of the project	- Number of total participants: 8 - Number of female participants: 4 - Number of researchers, data managers, and research users trained: 4 - Number of government agency officials trained: 5
June 8, 2023	Face-to-Face (Ma'an Hospital)	Trained hospital staff on how to conduct and fill out the Hospital Patient Survey, study protocols, inclusion criteria, and an overall discussion on the goals and objectives of the project.	- Number of total participants: 5 - Number of female participants: 0 - Number of researchers, data managers, and research users trained: 4 - Number of government agency officials trained: 4
June 20, 2023	Mix – Face-to-Face (IQVIA Offices)/Virtual (MS teams)	Trained on different discussion guides for the stakeholder to conduct key informant interviews, refresher training on Survey Solutions and testing of the platform	- Number of total participants: 6 - Number of female participants: 3 - Number of researchers, data managers, and research users trained: 2
Sept 5, 2023	Face-to-Face (Jordan Hospital)	Discussion on the goals and objectives of the project. Hospital Patient Survey discussion, study protocols, and inclusion criteria	- Number of total participants: 5 - Number of female participants: 1 - Number of researchers, data managers, and research users trained: 4

Sept 17, 2023	Face-to-Face (Mafraq Hospital)	Discussion on the goals and objectives of the project, Hospital Patient Survey discussion, study protocols, and inclusion criteria	- Number of total participants: 8 - Number of female participants: 3 - Number of researchers, data managers, and research users trained: 5
Nov 26, 2023	Mix – Face-to-Face (IQVIA Offices)/Virtual (MS teams)	Trained the new field supervisor on how to conduct the Hospital Patient Survey, how to train hospital staff on how to conduct the Hospital Patient Survey, study protocols, ethical procedures, tracking sheets; and trained on using the Survey Solutions for the Hospital Patient Survey	- Number of total participants: 3 - Number of female participants: 1 - Number of researchers, data managers, and research users trained: 2 - Number of government agency officials trained: 0
Jan 27, 2023	Face-to-Face (Al Zarqa Hospital)	Discussion on goals and objectives of the project, Hospital Patient Survey discussion, study protocols, and inclusion criteria	- Number of total participants: 11 - Number of female participants: 7 - Number of researchers, data managers, and research users trained: 9 - Number of government agency officials trained: 9
Jan 28, 2023	Face-to-Face (Al Salt Hospital)	Discussion on goals and objectives of the project, Hospital Patient Survey discussion, study protocols, and inclusion criteria	- Number of total participants: 5 - Number of female participants: 2 - Number of researchers, data managers, and research users trained: 2 - Number of government agency officials trained: 2

Appendix E: Insurance Statistics

Number of Deaths and Human Injuries Due to Road Traffic Crashes for the Years 2020–2022			
Indictor	**2022**	**2021**	**2020**
Number of RTA	169,409	160,600	122,970
Number of RTA with human injuries	11,510	11,241	8,451
Deaths	562	589	461
Severe injuries	805	737	558
Moderate injuries	6,739	6,325	4,788
Mild injuries	9,552	10,423	7,344

Total Vehicle Premiums for 21 Insurance Companies for the Years 2019, 2020, 2021, and 2022 in Jordanian Dinars Compulsory insurance (from Licensing Centers—Comprehensive—from Borders) and Supplementary Insurance						
Year	**Compulsory insurance premiums/from licensing centers**	**Compulsory insurance premiums/from comprehensive**	**Compulsory insurance premiums/from borders**	**Total of compulsory insurance premiums**	**Supplementary insurance premiums**	**Total**
2019	112,752,283	36,871,600	16,766,315	166,390,198	67,965,285	234,355,483
2020	108,938,293	35,649,893	7,681,569	152,269,755	60,154,742	212,424,497
2021	106,203,887	42,609,825	12,748,023	161,561,735	64,562,159	226,123,894
2022	127,681,228	29,627,630	20,640,551	177,949,409	67,062,098	245,011,507

Total Vehicle Compensations for 23 Insurance Companies for the Years 2019, 2020, 2021, and 2022 in Jordanian Dinars Compulsory Insurance (from Licensing Centers—Comprehensive—from Borders) and Supplementary Insurance						
Year	**Compulsory insurance compensations/from licensing centers**	**Compulsory insurance compensations/from comprehensive**	**Compulsory insurance compensations/from borders**	**Total of compulsory insurance compensations**	**Supplementary insurance compensations**	**Total**
2019	122,357,743	41,412,005	6,026,401	169,796,149	64,561,215	234,357,364
2020	96,651,238	31,746,506	4,677,111	133,074,855	51,781,160	184,856,015
2021	104,303,677	37,224,749	4,198,292	145,726,718	55,417,407	201,144,125
2022	112,601,594	47,483,222	5,046,367	165,131,183	58,298,505	223,429,688

The value of payments made for staged Injuries, estimated at 30% of vehicle compensations in Jordanian Dinars	
2019	70,307,209
2020	55,456,805
2021	60,343,238
2022	67,028,906

Appendix F: Data Collection Tracking Sheet

No	Data collector/Interviewer initials	Patient/Respondent name (first name, last name)	Patient/Respondent ID	Patient/Respondent phone number(s)	Date of admission to hospital (DD/MM/YYYY)	Date of discharge from hospital (DD/MM/YYYY)	Follow-up surveys		
							Visit dates (DD/MM/YYYY) and status	One-month follow-up	Three-month follow-up
							Date		
							Status 1. Complete 2. Not available 3. Refused		
							Date		
							Status 1. Complete 2. Not available 3. Refused		
							Date		
							Status 1. Complete 2. Not available 3. Refused		
							Date		
							Status 1. Complete 2. Not available 3. Refused		
							Date		
							Status 1. Complete 2. Not available 3. Refused		

Road traffic injuries (RTIs) are a critical public health issue in Jordan, as highlighted in the 2022 Annual Report on Road Traffic Injuries. With 169,409 crashes recorded, resulting in 562 deaths and a range of injuries, RTIs have emerged as the leading cause of death for children and young people, and the second-leading cause for adults aged 20–64. This study aims to understand RTI-induced disabilities in Jordan, identify contributing factors, and assess the associated costs for patients.

Employing a mixed-methods approach, the research included quantitative and qualitative data collection through hospital-based surveillance and follow-up surveys at one- and three-months post-injury. Six hospitals across Jordan participated, including both public and private institutions. Key informant interviews with stakeholders from various sectors were conducted to gain comprehensive insights.

The study's findings reveal that most RTI patients were male (79%) with an average age of 34 years. Crashes predominantly occurred during early mornings and night hours on main roads, involving mainly cars (72%) and motorcycles/bicycles (40%). A significant number of patients (74%) received prehospital care, primarily from ambulance staff. Most patients (66%) were fully conscious upon arrival at the emergency room.

Injury analysis showed that 58% of patients had a single injury, with extremities being the most affected area. Common treatments included sutures and surgical operations, with internal fixation for fractures being prevalent. Financially, 49% of patients incurred immediate costs upon hospital admission, and follow-up care also resulted in out-of-pocket expenses, particularly for physiotherapy and medications.

Disability outcomes indicated that 79% of patients experienced some disability at the one-month follow-up, with varying degrees from mild to extreme. By the third month, 73% reported no disability, though 26% continued to experience mild impairments. This study underscores the significant burden of RTIs in Jordan, highlighting the need for targeted interventions to reduce injuries and support affected individuals.

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