

## Road Traffic Accidents in Kuwait City: A Triangulation Approach

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### ABSTRACT

In recent decades, incidents of motor traffic accidents have increased dramatically in Kuwait, putting both passengers and pedestrians at increased risk of injury or death. The intent of this study was to research and analyze the cited causes for these accidents and in this way assist law makers and emergency services in reducing further casualties. By collecting data from interviews, focus group discussions, empirical observations, and review of secondary sources and applying a combination of quantitative and qualitative analysis (the triangulation method) to the causes of these accidents in Kuwait City in 2010–2011, this study found that flaws in highway design, driver carelessness, poor road management and maintenance, use of cell phones, alcohol and drugs, and young age/inexperience of the victims constituted the primary causes of traffic accidents in Kuwait. The author recommended a number of ameliorative measures, including a review of legislation, training, and road safety awareness campaigns. Limitations of the current study included the single geographical area of study and limited timeline; future research should include comparative studies of road traffic accidents in Kuwait and other Gulf and Arab countries. A cross-national perspective would help the government better understand the costs that road traffic accidents impose on Kuwaiti society and neighboring states.

**KEY WORDS:** Traffic accidents; risk theory; systems theory; triangulation method

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### INTRODUCTION

According to World Health Organization (WHO) estimates, 1.17million fatalities occur annually worldwide as a result of road traffic accidents [1] (World Health Organization,2011). In the Arab and Gulf states, in particular, road traffic accidents (RTAs) are increasingly recognized as an urgent social problem. In Kuwait, the discovery of oil during the mid-twentieth century transformed many aspects of life, leading to explosive immigration and population growth, accompanied by a concomitant increase in the number of vehicles and the rapid extension of the road network. The momentum for growth accelerated in the early 2000s following the removal of Saddam Hussein in nearby Iraq [2] (Kimmitt, M. 2009), and the growth of oil revenues due to high global crude prices, further increasing the expatriate population and exacerbating traffic and congestion issues on Kuwait's road network.

As a consequence, RTAs are now common in Kuwait, a country of almost 2.5 million people. Over 45,878 traffic accidents were reported in 2004alone. Hotspots include the Fahaheel Expressway (Road 30) south of the Fourth Ring Road and the Alhmadi Expressway (Road 40) south of the Fourth, Fifth, and Sixth Ring Roads [3] (Statistical Annual Report, 2012).An Interior Ministry official, citing data from the Information and Statistics Division of the General Traffic Department, indicated that 86 percent of RTA deaths were males, compared to 14 percent females. Four hundred people were killed and 8,000 injured in traffic accidents in 2012 alone, according to a report from the local daily. According to the Ministry of Interior Statistics Annual Report (2012), around 67,000 accidents were reported across Kuwait that year, the majority of which were reported in the Capital Governorate (20,762), followed by Mubarak Al- Kabeer (5,169). The data also show that the number of traffic accidents increased by 20 percent on average in each governorate.

#### Road Traffic Accidents in Kuwait

Prior to the implementation of more rigorous traffic safety laws in November 2001,Kuwait had one of the highest accident fatality rates in the world. To augment the new laws, over 70 traffic cameras were installed nationwide to record speed and red-light violations. Despite the improved enforcement environment, overall traffic safety has not improved in Kuwait. In 2006, for example, over 2.75 million traffic violations were recorded, including over 313,000 red-light and 840,000 speeding violations [3] (Statistical Annual Report, 2012), representing an increase over previous years.

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According to recent studies by the General Traffic Department, 75,194 accidents occurred on Kuwaiti roads (Statistical Annual Report, 2015), which amounts to an average of 206 per day, or 8.5 per hour. Fatalities also have climbed to 493 per year, or 1.3 per day. [4] (Statistical Annual Report, 2015), This represents a rise from 2011, when a WHO study of road traffic deaths in Kuwait published in April of that year estimated the figure at 402 annually, accounting for 9.2 percent of total deaths (from all causes), or an age-adjusted death rate of 16.4 per 100,000 population. Traffic accidents rank eighth among the top 20 causes of death in Kuwait, after heart disease, stroke, influenza/pneumonia, diabetes, breast cancer, hypertension, and kidney disease[5 ] (World Health Organization,2011).

The National Traffic & Transport Sector Strategy for Kuwait 2009-2019 estimates that traffic congestion and accidents will cost the country 27.430 billion Kuwaiti dinars (KD) over that period, and expenditures to deal with accidents will amount to roughly 6 percent of annual GDP. The Strategy was launched by the Interior Ministry in partnership with the United Nations Development Programme and Kuwait's Supreme Council for Planning and Development to create a more efficient and safe road transportation system by reducing traffic congestion and the related economic and environmental problems. International experts at a "Traffic" conference held a few years ago in Kuwait observed the trend of growing road accidents in Kuwait, and initiated a discussion about its possible causes. These included, but were not limited to: (a) growing wealth, increasing demand for newer and faster cars; (b) growth of the automobile fleet, increasing congestion;(c) speeding; inadequate law enforcement;(d) aversion to use of public transport;(e) use of mobile phones while driving; and (f) not following basic safety rules such as wearing seat belts. A survey of newspaper reports over the years on traffic accidents by the *Arab Times* and other local dailies revealed that despite authorities' efforts to address the problem, the accident rate climbed steadily, increasing by over 40 percent between 2010 and 2012. The rationale of the current study is to confirm and investigate these causes in order to provide data that will inform decisions for policymakers, emergency services, and individuals.

This contribution is critical, as the rising trend in road traffic violations and accidents has become a salient issue for government policymakers in Kuwait, in the Ministry of Interior and related departments. A Higher Traffic Council has been established to address these issues.

For example, the Interior Ministry, examining 2010 statistics in Kuwait and other international studies, determined that texting and Internet browsing while driving were major causes of road accidents. It identified the use of hands-free technology such as Bluetooth as viable alternatives to the use of cell phones while driving. Following these determinations, the country toughened laws against the use of cellular phones while driving, supporting them with appropriate public awareness measures.

We now turn to a more detailed examination of traffic violations by type/cause in Kuwait, using data for 2006 (Table 1). A total of 2.76 million violations were recorded during that year for the country's six governorates. In addition to minor parking violations, a substantial number of total violations involved the running of red lights or excessive speed. Further, over 80,000 seat belt violations also led to elevated safety concerns [3] (Statistical Annual Report, 2012). The Ministry of Interior is now taking steps to strengthen the financial penalties associated with traffic violations. Over KD 25 million were collected in fines, the licenses of several drivers were suspended, and dozens imprisoned for serious violations.

**Table 1**  
**Traffic violations**

Traffic violation	Capital	Hawally	Farwania	Al-Jahra	Al-Ahmadi	Mubarak Al-Kabeer	Others*	Total violations
Drunk driving	1	2	4	0	1	5	0	13
Red-light running	2829	10033	1612	2459	1568	3237	291689	313427
Over-speed violations	1202	4445	738	1142	942	9580	822428	840477
Driving in opposite direction	21793	29902	15470	897	4329	2783	13	75187
Driving without license	8514	14355	5796	4800	4481	13981	1	51928
Driving without license plate	2339	3148	1183	1372	1405	2586	6	12039
Seat belt violations	3098	20047	11024	4530	27146	15978	2	81825
Traffic rules violations	6730	4433	2656	790	4334	25270	26	44239
Parking violations	97883	64164	71007	34784	106967	30753	25	405583
Parking in places reserved for handicapped	1817	559	2354	279	2832	518	0	8359
All violations	291541	387773	219868	141862	266384	332887	1117170	2757485

\* Traffic violations recorded live by camera

### **Problem Statement and Objectives**

The above statistics illustrate a significant problem: Traffic incidents in Kuwait have been increasing in both frequency and severity over the last twenty years. The causes, and thus solutions, are not clearly identified. The current study will add to the literature by being the first to investigate each of these causes through triangulation of both qualitative and quantitative sources, to gain rich data for planning, accident prevention, and providing an impetus for future research. The primary objective of the present study is to explore and identify the factors contributing to high rates of automobile accidents in Kuwait City. More specifically, the study focuses on achieving the following goals: (a) describing the number of vehicular accident—related injuries and fatalities in Kuwait City in 2010 and 2011; (b) identifying the major factors that contribute to RTAs; and (c) assessing various road safety measures implemented by local officials for the purpose of accident prevention.

### **Research Questions**

1. How many casualties (injuries and fatalities combined) occurred in Kuwait City? (review of Kuwait City hospital records, and more specifically the hospital admission cards of 2010-2011 accident victims).
2. What factors are associated with the causes of RTAs in Kuwait City? (interviews with in/outpatient accident victims at Kuwait hospitals, government officials, Kuwait City traffic police, and relevant officials from the Ministry of Health).
3. What safety measures have been implemented by local authorities to prevent RTAs in Kuwait City? (interviews with local authorities in Kuwait City).

## **LITERATURE REVIEW**

Past investigations have demonstrated that injury and fatality rates in the UAE and in various Gulf countries are significantly higher than in the industrialized Western nations with the highest levels of vehicle ownership [6](Bener, Abu-Zidan, Bensiali, Al-Mulla, Jadaan, 2003). When framed in these terms, the importance of the issue dictates the need for greater research on automobile accidents and related hazards. Driver behavior obviously constitutes a critical factor. In any case, age, gender, marital status, training and experience, background, lifestyle, energy level, response time, vision, attentiveness, and vehicle speed also are major factors in RTAs [7] (Gregersen and Bjurulf, 1996).

Focusing only on RTA fatalities, the major factors include driving under the influence (DUI) of alcohol or drugs, excessive speed, and failure to use seatbelts [8] (Clarke et al., 2010). Among traffic fatalities, use of alcohol and/or illicit or prescription medications that impair driving skills is a frequent common denominator. A variety of studies indicates that roughly half (40–50%) of drivers involved in fatal traffic accidents had some psychoactive substance in their bloodstream [9, 10, 11]. (Carmen Del Rio et al., 2002; Drummer et al., 2003; Jones et al., 2009). Case-controlled studies have determined that the use of alcohol and/or drugs increases the risk of a traffic accident, regardless of whether the controls were fatally injured drug- and alcohol-free drivers [10] (Drummer et al., 2004) or drivers recruited at random while driving on public roads [12] (Movig et al., 2004). The risk is especially high when alcohol and drugs are used simultaneously, or when multiple illicit or prescription medications are taken [13] (Gjerde et al., 2011). A good example of the salience of drugs and alcohol in RTAs is Finland, where an average of about 108 persons perished annually (2005–2009) in RTAs involving intoxicants, out of a total of over 200 RTA fatalities overall (279 in 2009; [14] Statistics Finland, 2010). Finland's long-term target, similar to the European Union's road safety plan for 2011–2020 [15] (European Commission 2010), is to reduce the total number of fatalities by half—meaning that for Finland there would be no more than 100 deaths on the country's roads by 2025 [16] (Finnish Government, 2006).

Returning to road traffic accidents more broadly, Redelmeier and Tibshirani's ground breaking case-crossover study found that drivers were four times more likely to be involved in a traffic accident when using cell phones while driving, and that hands-free devices were not less dangerous than handheld ones [17]. This finding was later supported by McEvoy et al. [18]. Nonetheless, drivers believe that hands-free devices are far less dangerous; in some studies, drivers see them as posing no risk whatsoever [19] (Dragutinovic and Twisk 2005).

Other studies have determined that drivers adjust their phone use to fit the driving environment they perceive around them. They make fewer calls in heavier traffic, and when on the phone they reduce speed and increase the distance between their vehicle and the one in front. And although drivers who use the phone while driving are more likely to be involved in an RTA, relative crash risk does not differ according to either gender or phone type.

## **Theoretical Perspectives**

### ***Systems theory***

Systems theory is grounded in human adjustment (or lack thereof) to the surrounding environment [20](Muhlrad et al 2005). In the realm of road transportation, this theory encompasses the following components: environment, means of transport (vehicles), and human behavior [21](Krug et al 2000). In this formulation, the means of transport comprises both the number and quality of vehicles on the road, and human behavior encompasses such traits of road users as age, gender, education, socio-economic status, and risk perception. Thus, systems theory when applied to road transportation envisions a system of traffic management and regulation designed to support and maintain traffic safety ([22, 23] Hauer, 1995:136; Button, 1993:80).

### ***Risk theory***

Risk theory, which defines risk as a person's subjective assessment of a negative event with potential consequences for themselves ([24, 25] Sjøberg & Biel 1983, Rundmo 2004 & Moen, identifies several variables believed to influence risk perceptions among the public. Social relations and media are posited to influence how individuals and societies react to potential risks ([26, 27] Slovic 1987, Olterdal, Moen, Klempe & Rundmo, 2004). Many aspects of risk need to be considered—first and foremost the probability of a negative event and the severity of its consequences. Processing and appraisal theories may also influence such assessments. Several scholars have found that the greater the impacts of a negative event, the more those impacts will be salient in the assessment of that risk, and the greater the precautionary action that will be taken to prevent an accident ([28] Rundmo & Iversen, 2004). Personal decisions involving risk-taking are a balancing act between perceptions of risk and an individual's propensity to assume risk ([29, 30] Wilde 2002; Adams 1995). Risk propensity, in turn, is affected by expected rewards; as the perceived threat or hazard increases, individuals respond by becoming more cautious. Thus, there is a "balancing behavior" between the perceived threat and willingness to assume risk, which in turn influences accident likelihood and potential rewards.

## **RESEARCH DESIGN AND METHODOLOGY**

This study adopts a case study approach, within which the relied-upon methodology for data collection involved both qualitative and quantitative methodologies for the analysis of data from interviews, focus group discussions, empirical observations, and review of secondary sources. A common term in the social science literature to describe such joint use of qualitative and quantitative methods is "triangulation." Triangulation makes it possible for a researcher to collect data from multiple sources to address important questions from diverse points of view[31] (Baker 1999), widening the study's perspective while at the same time bolstering its validity. This approach is quite useful, for example, when an analyst seeks to examine broad patterns of social life or describe mass public reactions to social policy. Triangulation was instrumental in the following analysis of the risk factors of RTAs in Kuwait City, as it allows the public to use this information to better formulate road safety policy according to local reality and practices.

### ***Qualitative methodology***

The qualitative research methodology utilized here employs several alternative techniques: interviews, participant observation, and focus group discussions. This approach supports an understanding of the daily lives of those affected by RTAs [32](Limb and Dawyer, 2001). More specifically, here it was used to collect primary data via interviews with accident victims (at Kuwaiti hospitals), police and hospital officials, the author's own observations, as well as information gleaned from interviews and a focus group of government officials concerning measures implemented to reduce the frequency of RTAs in Kuwait City.

### ***Quantitative methodology***

The quantitative data used in this study were compiled from a review of the hospital records of road accident victims admitted to two large hospitals in Kuwait City from 2010 to 2011; a checklist/questionnaire form was devised to collect such data. The purpose was to assess patterns and trends of RTA injuries and fatalities in Kuwait City during 2010–2011.

All hospital records were systematically reviewed and manually sorted to limit the information to that relevant for the years 2010 and 2011. The questionnaire was then used to select out specific individual information about these accident victims from the hospital records. The data were analyzed by the Statistical Package for the Social Sciences (SPSS), a widely used software package that produces a variety of statistical tables and performs some simple statistical computations. Standard

statistical tables were generated to examine the relationship between the outcome variables of fatalities or injuries and the exposure variables of age and gender. The results were then summarized to reveal the patterns that are discussed below.

**Sample selection**

Two hospitals in Kuwait City—Mubarak Alkabber and Alammiri—as well as the Ministry of Interior were selected for the collection of data on RTA victims in Kuwait City. The two hospitals provide emergency services to RTA victims and are repositories of information about traffic accidents, type of vehicles involved, number of injured persons, number of fatalities, and location of accident. The Ministry of Interior, in addition to holding responsibility for ensuring that traffic rules and regulations are enforced, also records and evaluates the probable causes of traffic accidents in Kuwait City.

In any study that relies on interviews as part of its research design, sampling is an important consideration in decisions concerning the persons to be interviewed, so as to properly represent the larger population [33](Patton,1990) and to reduce bias in the results [34](Flick 1998). The sample of respondents selected for this study carefully considered the balance between men and women; although both genders are not equally represented among the driving population, both were included representatively in the sample. The focus of the interview sample on RTA victims is understandable, as a person who is directly injured by the hazard will be in a better position to explain from a personal perspective the feeling of danger or risk from that particular phenomenon [25] (Moen & Rundmo, 2004).The victims are the very first people who experience the effects of road traffic accidents , followed by government officials (first responders) responsible for public safety, and then the owners of the vehicles sustaining property damage[35](The National Council of Road Traffic Safety in Kuwait).

**Reliability and validity**

An interview with a police commander in the Ministry of Interior revealed that police records are generally not updated as more recent information becomes available (post-accident), but hospital records can be updated to reflect changes in the condition of accident victims. This provides an example of how use of triangulation made it possible to verify and cover gaps in information commonly encountered when reliance is placed solely on a single source of information.

It should be noted that confirmation of data reliability per se was not the primary objective of the research. In order for the study to be fully replicable, it would have to follow strict rules of quantitative research. This was not the case here because the study is not fully quantitative. Therefore its findings may not be replicable even if the same general methods of data collection (triangulation) are employed, since the specific setting of the study and period of time in which it was conducted would quite likely influence the results. Field work undertaken by different people at different times could easily produce different results [31] (Baker 1999).

**RESULTS OF QUANTITATIVE ANALYSIS**

**RTA trends in Kuwait City**

As shown in Table 2, road traffic accidents of all types increased in Kuwait City over the years covered in this study (2010 and 2011). The striking takeaway from the table 2is the sheer magnitude of the incidence of RTAs: 65,861 in 2010 and 75,194 in 2011.

**Table 2**  
***Kuwait City Road Traffic Accidents by Category and Year***

Type of Violation	2010	2011
<b>Collision</b>	64938	74177
<b>Run Over</b>	336	374
<b>Rollover</b>	478	540
<b>Others</b>	109	103
<b>Total</b>	65861	75194

*Source:* Police records and hospitals reports (2010–2011)

**Injuries versus fatalities**

Table 3 shows the trend in terms of the severity of RTA casualties (minor injury, severe injury, fatality) on Kuwait City roadways in 2010 and 2011. For the two years in aggregate, there were 2624 casualties of all types with an average of 41% minor injuries, 26% severe injuries, and 33% fatalities. As is evident, casualties of all types increased from 2010 to 2011. If anything, the overall picture is understated, as many accidents go unreported, and police only receive information about

these accidents through insurance companies seeking to verify their occurrence when processing claims filed by their customers.

The aforementioned interview with the Interior Ministry police commander yielded some insight into the factors contributing to the surge in casualties in Kuwait City. Among the more common factors, he mentioned dangerous driving behavior and driving under the influence of alcohol and drugs. Interviews with accident victims shed light on additional factors at work. One victim interviewed indicated that inadequate traffic separation, absence of road signage, and high traffic volume greatly increase the frequency of RTAs in Kuwait City. Use of highway frontage for unintended purposes, such as a market space for local traders, also contributes to traffic accidents in the city.

**Table 3**  
*Levels of Injury and Percentage of Incidence*

Type of Injury	2010	Percentage	2011	Percentage	Total	Percentage
Minor Injury	500	43%	585	40%	1085	41%
Severe Injury	286	25%	386	26%	672	26%
Death	374	32%	493	34%	867	33%
Total	1160	100%	1464	100%	2624	100%

Source: Police records and hospitals reports. (2010–2011)

#### *Fatalities by gender*

Table 4 presents the distribution of fatalities by gender in Kuwait City. In total, there were 867 traffic fatalities in 2010–2011, involving a much higher incidence among males (87%) compared to females (13%). An underlying cause of this disparity is that males are more likely to be involved in RTAs because their daily activities and careers involve more travel.

**Table 4**  
*Distribution of RTA Fatalities by Gender (Kuwait City)*

Death	2010	2011	Total	Percentage
Male	315	437	752	87%
Female	59	56	115	13%
Total	374	493	867	100%

Source: Police records and hospitals reports. (2010–2011)

#### *Fatalities by age*

Table 5 provides data on fatalities by various age cohorts. The highest percentage shares of overall fatalities belong to the age groups 21-30, 31-40, 11-20, and 41-50 years, respectively. These findings are consistent with studies elsewhere in the region (Bener et al. 1992), where the majority of fatalities involved males less than 30 years old.

**Table 5**  
*Distribution of RTA Fatalities by Age (Kuwait City)*

Age	2010	Percentage	2011	Percentage	Total	Percentage
1-10 years	16	4.3%	30	6.1%	46	5.3%
11-20 years	66	17.6%	99	20.1%	165	19.0%
21-30 years	100	26.7%	111	22.5%	211	24.3%
31-40 years	77	20.6%	102	20.7%	179	21.0%
41-50 years	54	14.4%	73	14.8%	127	15.0%
51-60 years	30	8.0%	41	8.3%	71	8.1%
61 and above	30	8.0%	36	7.3%	66	7.1%
Unknown	1	0.3%	1	0.2%	2	0.2%
Total	374	100%	493	100%	867	100%

Source: Police records and hospitals reports. (2010 – 2011)

## **Results of Qualitative Analysis**

### *A crisis of traffic fatalities in Kuwait*

Recently, the head of Kuwait's Traffic Safety Society acknowledged that Kuwait now has the highest fatality rate per accident in the world: 17 deaths per 100,000 accidents. A primary factor, he related, are overcrowded roads: built to handle 700,000 vehicles, Kuwait's roadways actually serve over twice this number (1.6 million). If unaddressed, the problem will only worsen over time, as roughly 80,000 new vehicles are added each year.

Confronted with the problems of overcrowded roads, driving under the influence, and (increasingly) distracted drivers, Kuwait's Ministry of Interior was compelled to formulate a strategic

vision to address the rapidly worsening road safety conditions revealed by the 2010 and 2011 statistics. Among other measures, the Ministry has toughened legislation restricting use of cell phones while driving, supported the new laws with public awareness programs, and advocated alternative hands-free technologies.

### ***Mystique of the automobile***

Despite Kuwait's alarming accident statistics, the mystique of the automobile lives on. In Kuwait, the automobile is a deeply entrenched symbol of social status and freedom. Owning a fast car may give drivers a feeling of superiority over others who use public mass transport or operate a less powerful vehicle.

In addition to providing the thrill of speed, adventure, and freedom, an automobile provides a means of self-congratulation, a reward to its owner and an outward a sign of how hard he has worked to possess it. A luxury car is thus a way its owner can publically to pamper himself. To many drivers, cars are simply entrancing. The feeling of speed and motion, the roar of the engine, and the blur of lights and colors can nearly mesmerize driver, who may feel a deep connection with the machine. Of course, the joys of driving are not felt by all: for many elderly, piloting a complicated vehicle through challenging and risky road conditions is not an experience to anticipate with pleasure.

Many young people expressed a special admiration and interest in their cars, spending considerable time maintaining their vehicles and ensuring they were in good condition both aesthetically and mechanically. A male noted that "I always talked about my car and how I loved to drive it." In another example, a female stated: "I would not wish to damage my car in any way. My car was a pride and joy. I would even pick parking spaces away from other vehicles so that it wouldn't get marked or damaged."

### ***Risk-taking youth***

Young Kuwaitis usually know in principle how to use the roads safely, although some acknowledge that their behavior becomes more careless as they grow older. But with increasing independence, teenagers who spend less time under adult supervision may start to take risks they would not otherwise have taken had their parents been watching. Although teens report that they have more frequently been involved in "common risk" behavior, many believed their improved ability to see over the steering wheel, judge distances, and drive at higher speeds meant that even when taking risks they were not exposing themselves to appreciably greater danger. While some admitted to taking "common risks," many were unable to explain why, seemingly doing so subconsciously. Some Kuwaiti teenagers explained this in terms of not wanting to waste time: rather than stopping at crossings they proceed through, because it takes "too long" for the light to change. Others suggest that behaving too cautiously not "cool." Some young Kuwaitis argued that risk-taking at crossings was not a choice but a necessity, due to the lack of designated crossing places. However, there is scant evidence that building more crossings would produce a corresponding increase in their use. Most youthful Kuwaitis rarely stop at crossings, even where they are abundant.

Many of the young Kuwaitis interviewed had been involved in a pedestrian RTA or knew of an acquaintance who had. However, even such personal experiences failed to alter their longer-term decision-making. Interviews with young accident victims, or with youths who have known someone involved in one, highlight another discrepancy: when asked what would deter them from risk-taking behavior on the road, most responded "if it happened to me." In reality, however, such personal experiences rarely affect actual behavior. For instance, teens who had witnessed serious accidents believed that it changed their behavior only for a few days thereafter; they soon resumed risky actions during everyday driving. Continuing to engage in risky behavior may in part reflect Kuwaiti teenagers' idea of what is "serious." Most Kuwaiti adults consider bruises, cuts, and broken bones to be serious outcomes (these are part of the definition used in official RTA statistics). However, many young Kuwaitis do not view such injuries as deserving particular concern. To some Kuwaiti teenagers, only accidents that kill or permanently maim are deemed "serious."

### ***Dangerous driving***

In the interviews, hazardous driving behavior was associated with the majority of accidents, and particularly: high-speed driving, following too closely, racing, and dangerous passing maneuvers. Excessive speed was involved in almost all cases. In one interview, a witness observed that: "My first impression was that [the car] was traveling far too fast to negotiate the bend safely . . . I could see his hands turning the steering wheel to his right in a large movement, his whole body movement and body language gave me the impression of panic." Another witness observed that the style of a male driver

could be altered by the presence of other males in the vehicle, increasing his bravado and propensity for risk-taking. In contrast, a female passenger stated that: "He always drove safely with me in the car. He drove faster when the boys were in the car. I had not experienced him driving excessively fast myself." Her statements reflected a positive view of the ability of the driver, even though he had later perished in a vehicular accident. Similarly, the female partner of another individual reported that the driver was excellent, given that he was still young and had not gained much experience: "He never drove fast with me or [their baby] in the car and certainly wouldn't do so if the roads were potentially risky. He constantly talked about other accidents he'd seen to and from work, which always reassured me that he'd drive safely."

### ***Inexperience and overconfidence***

However, the assessments by men of other drivers were not always so positive. A good example is a father's evaluation of his own son: "He was in my eyes a typical young driver. He had a few bumps and things. I would say he was a confident driver but at times over confident. He sometimes drove and I would say, 'Stop, drop me off.' I think his driving just needed maturity." These evaluations of driving ability typically were linked to the young driver's failure to fully comply with safety regulations. Although most young Kuwaitis followed safety regulations, failure to wear a seatbelt or helmet implies overconfidence among such drivers in terms of their ability to avoid accidents while driving. In a particularly salient case, despite involvement in an accident one week prior to his death, the driver opted not to put on a seatbelt. A friend described this driver's outlook as follows: "I can say that [with respect to] the habit of wearing a seatbelt, he found it too restrictive. I had asked him if he was wearing one when he hit the van [referring to prior collision]. He said he had not but had been able to brace himself on that occasion against the steering wheel."

Another example of overconfidence and an inflated sense of driving skills involved two cars that were racing. Police interviews of the male driver of the second car, who was unharmed, revealed the following: "He agreed that he had been driving 2 to 3 car lengths behind at approximately 100 km per hour. He did not consider this to be an unsafe following distance."

In another example, a rear-seat passenger stated: "I also saw at least one large arrow shape, pointing to our left. I knew this to mean that we should stay on our own side of the road. [The front seat passenger] was shouting, 'What are you doing? You are not going to make that!' or [something] similar. I became aware that we were now on the wrong side of the road...As this was happening I heard [the front seat passenger] shout a second time. This sounded much more urgent than before, as he said, 'We're not going to make that.'" The Interior Ministry report on this incident reads in part as follows: "A citizen in his teens died and another sustained severe injuries and additional fractures during a traffic accident on the Fahaheel Expressway. Acting on information the Operations Room of the Interior Ministry received in that concern; paramedics with security operatives rushed to the scene and carried the injured person to Al-Adan Hospital for medical attention, while the remains of the victim were deposited to Forensics."

Families of road accident victims who were interviewed indicated that often the guilty are not the ones who pay the full price for their violations. A young widow said her husband died when a speeding motorist lost control and crashed into his car. In another example, two Kuwaiti girls were killed at the scene when a bus failed to stop at a red light and crashed into their car. Family members indicated that these instances underscore the need to institute very severe punishments against traffic violations, adding that: "Violations like jumping a red light should be treated like first degree crime." Some also emphasized the need to apply the laws equally to all, "citizens and expatriates alike, to ensure that everyone respects the rules of the road."

## **DISCUSSION**

This paper has examined both the distribution and trends of RTAs based on interviews conducted with accident victims, a leading government traffic official (police commander in the Interior Ministry), focus group discussions with officials including from the Ministry of Health, and hospital personnel in Kuwait City in 2010 and 2011. The number of accidents and fatalities increased in each of these years, putting both passengers' and pedestrians at heightened risk of injury or death on the road. Young males are especially susceptible to RTAs in Kuwait City, reflecting a predilection toward risk-taking [36, 37, 38] Iversen & Rundmo, 2002; Oltedal, & Rundmo, 2006; Lund & Rundmo, 2009) that has been found to play a role in RTAs throughout the world. Young drivers are more prone to faulty risk perception, and may feel some degree of invulnerability to traffic risks [39, 40]. (Weinstein, 1984; Deery 1999). Our qualitative analysis has shown that flaws in highway design, driver carelessness, poor road management and vehicle maintenance, alcohol and drug use, and inexperience



and overconfidence on the part of young drivers all play a major role in the incidence of traffic accidents in Kuwait. The Interior Ministry police commander also identified the following arrest-worthy vehicular offenses in Kuwait City that are commonly associated with RTAs: crowding too many passengers into a vehicle, driving while intoxicated, speeding, failure to use a seatbelt, driving without a license, driving without headlights turned on, failure to have insurance, worn-out tires, absence of side mirrors, and overloading of trucks with cargo.

Other hazards identified by the commander involve the design of the roadway itself, which is typically too narrow (accommodating only two lanes so that passing is impossible or hazardous), in need of repair, and lacking sufficient signage and traffic separation.

He also mentioned that Kuwaiti roadways are not well equipped with features that could accommodate the diverse characteristics and behavior of road users, vehicles, traffic, and the environment. More specifically, systems theory envisages a highway *system* designed to regulate traffic flow and to ensure that drivers observe road use regulations in order to maintain traffic safety [22, 23](Hauer, 1995:136; Button, 1993:80). Yet interviews with accident victims reveal that inadequate signage and poorly designed (or uncontrolled) intersections and access ramps onto main roadways are major risk factors leading to traffic accidents in Kuwait City. According to systems theory, all of these risk factors represent contradictions within the traffic system.

In addition to systemic risk factors, most interviewees stated that driving while using a cell phone is one of the more prominent human behavioral traits leading to RTAs in Kuwait City.

Some accident victims (vehicle passengers) observed that their mishaps were caused by drivers using a cellular phone immediately preceding the accident, when the driver was concentrating on the phone. It was at this time that the victims began to sense instability in the automobile's movement just prior to the collision with another vehicle. This finding is consistent with international experience [29, 30](Wilde, 2002; Adams 1995).

Discussions with both the traffic police and accident victims also revealed a widespread view that the driving profession (i.e., commercial drivers, those who operate a vehicle as the primary activity connected with their employment) appear to be less educated than the general population in Kuwait City. Consequently, the quality of drivers is one of the risk factors leading to RTAs in the city. Complaints commonly voiced by the public about commercial drivers, and verified by the police, include the following: (a) commercial vehicles in Kuwait City are operating at speeds higher than appropriate for specific road and traffic conditions; (b) commercial operators do not pay adequate attention to the needs of non-motorized traffic and other road users; and (c) some drivers of commercial vehicles are under the influence of alcohol and drugs. Hospital personnel also observed during the interviews that all drivers, but especially those who spend the greatest time on the road, need to be more proactive in seeking regular medical exams to ensure their major sensory as well as vital organs (e.g., eyes, ears, heart) are in good condition and functioning properly. This could lessen the risk of accidents resulting from such hazards as a driver's failure to see a smaller vehicle at night, or a driver suffering a heart attack and losing control of the vehicle.

## CONCLUSION

Improved education concerning traffic safety is an important first step in the battle to reduce RTA injuries and fatalities. It is important that this effort focus first and foremost on Kuwaiti youth—as age and inexperience, cell phone use, carelessness, and alcohol and drugs are major factors in Kuwaiti RTAs—so that the country's future drivers will be safe and knowledgeable road users. This will also begin to address the issue of undereducated professional drivers. Teaching and learning should start before students reach driving age, so that bad driving behaviors do not have to be unlearned, and in order to instill a culture and awareness of road safety at an early age. Student-centered techniques should be incorporated into the appropriate curricula and could include field trips, role playing, group discussions, demonstrations, exercises, and projects. A national driver's license database should be developed and implemented.

The government could also play an important role in other areas. However, for this to happen, road safety must be accorded a priority not only in the budgetary process, but also in terms of enacting expanded and improved legislation (such as laws restricting cellular phone use while driving), accelerating policy implementation, and increasing community involvement. Surveillance and law enforcement efforts should be enhanced, especially during nights and weekends, when the risks of RTAs from driving under the influence increase dramatically. And in order to crack down on RTAs related to mobile phone use, the police should be required to determine whether a mobile phone is in use in vehicle at the time of an accident.

### Limitations and Future Recommendations

The limitations of the current study include sample size and method, which may impact generalizability. Though the research is focused on Kuwait specifically, by limiting research to urban hospitals the study potentially leaves gaps on issues that occur outside Kuwait City. An important focus of future research should be on the comparative study of RTAs in Kuwait and other Gulf and Arab countries. Such a cross-national perspective will help the government better understand the true costs that road traffic accidents impose both on Kuwaiti society and on the politics of neighboring states.

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