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Road traffic injuries to foreigners in the People's Republic of China, 2000-2008

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1. Introduction

The World Health Organization predicts that by the year 2020, road traffic deaths will decline by about 27% in high-income countries but will increase by more than 80% in low- and middle-income countries (Peden et al., 2004). The World Health Organization (WHO) has already actively partnered with the government in China to strengthen road safety and reduce road traffic injury and death (World Health Organization, 2007). A recent study indicates that road traffic injuries (RTIs) are a leading cause of all injury death in China (Wang et al., 2008). China is undergoing rapid motorization, with a mixture of motorized vehicles including cars and trucks, more motorcycles and scooters, and also tractors operating on public roads (Ma, Zhang, Lei, & Xiong, 2008). Vulnerable road users, pedestrians (26%), bicyclists (9%), and motorcyclists (28%), contributed to over 60% of all road traffic deaths in 2006 (World Health Organization, 2006).

With China's economic reforms, more and more foreigners are visiting China. Poor knowledge of local road conditions and a lack of understanding of local traffic rules may result in an increased risk of traffic crash involvement. However, research on road traffic injuries (RTIs) experienced by foreigners in China has not been reported in the literature. This study examines RTIs experienced by foreigners in China using official national statistics.

2. Methods

Our study was approved by the Institutional Review Boards of Southeast University. We first examined the number of registered motor vehicles for the time frame 2000-2008. We

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then report the number of foreigners entering China each year using data from the National Bureau of Statistics of the People's Republic of China.

To evaluate the RTIs of foreigners in China, we analyzed 2000-2008 data from the Bureau of Traffic Management of Ministry of Public Security of the People's Republic of China. Using uniform questionnaires, the Ministry of Public Security records all RTIs resulting in death or injury, including harm to drivers, passengers, pedestrians, cyclists, and motorcyclists. RTI fatalities include all traffic-related deaths that occur within seven days of the crash. A foreigner is defined as someone who was not of Chinese nationality. People from Hong Kong, Macao, and Taiwan were not considered foreigners in this national database.

3. Results

The number of registered motor vehicles in China has increased by 302% in 2008 compared to 2000 (Figure 1). The number of foreigners entering China has increased 2.4 times over the study period, from 10.16 million in 2000 to 24.33 million in 2008 (Table 1).

Table 2 shows the total numbers of fatalities and nonfatal injuries and those injuries among foreigners reported each year. From 2000- 2008, the number of fatalities among foreigners increased 2.5 fold. Nonfatal injuries during this same time frame increased by a magnitude of 1.8 (126 nonfatal injuries in 2000 to 223 in 2008.) As a percentage of the total RTIs, the percentages of fatalities and nonfatal injuries involving foreigners increased, respectively, from 0.02% and 0.03% in 2000 to 0.06% and 0.07% in 2008.

4. Discussion

This study suggests that about 40-50 foreigners suffer fatal road traffic injuries and about 200 foreigners are injured in road traffic crashes in China each year. With millions of foreigners working or visiting China each year, the total number of foreigners who suffer fatal and nonfatal road traffic injuries is relatively low. As mentioned earlier, vulnerable road users (pedestrians, bicyclists, and motorcyclists) account for the majority of fatalities in China (World Health Organization, 2007). It is not known if road traffic deaths to foreign visitors follow a similar pattern. It is also not known how often foreign visitors to China hire drivers, utilize taxis or public transportation, or drive cars.

In 2004, China mandated seat belt use for drivers and front seat passengers. In that same year, new cars were required to be fitted with rear seat belts. Evaluating and improving seat belt use in China has been the focus of a number of research and intervention efforts (Routley et al., 2007, Stevenson et al., 2007, Fleiter, Gao, Qiu, & Shi, 2009). Fleiter et al. found a low rate of functionally available seat belts in the rear seat (22.9%) of taxis in a convenience sample of Beijing taxis in early 2008 (Fleiter et al.).

When driving, foreign visitors bring their own rules and practices to an unfamiliar environment and may be at increased risk of injury or death. Studies of foreign drivers in other countries have suggested a lack understanding among foreign visitors of traffic signs, markings, and traffic signals compared with native drivers (Leviakangas, 1998, Dissanayake, 2001). Zhang, Huang, Roetting, Wang, and Wei (2006) compared driver's attitudes and behaviors through focus groups and an observational study among 18 drivers in Beijing and 26 drivers in Boston. They reported that Chinese drivers concentrate more on driving skills, but drivers in the United States focused more on practical safe driving guidelines (Zhang et al., 2006).

Unfortunately, in this national database, we were not able to determine whether the foreigner was a driver, a passenger, or other vulnerable road user when the road traffic crashes occurred. If China wants to establish surveillance of road traffic crashes among foreigners in the future, more data elements are needed.

Our data have limitations. The Ministry of Public Security claims data were not collected to conduct research, and therefore do not contain some important information. Therefore we could not evaluate potential risk factors for RTIs experienced by foreigners. Data regarding exposure to traffic were not available in this study; therefore, injury rates could not be calculated. The results presented are the Ministry of Public Security official statistics, but WHO estimates are higher due to differences in the source of data. The WHO estimates for China utilize the Disease Surveillance Points system and the Ministry of Health's Vital Registration System. Using a representative sample, WHO estimated the total number of deaths by cause for the whole country. The WHO estimate for 2002 was over 250,000 deaths caused by RTI (Peden et al., 2004). Thus, it is possible that the numbers of fatal and nonfatal road traffic injuries among foreigners in China were underestimated in this study.

Research Highlights

- With China's economic reforms, more and more foreigners are visiting China. Poor knowledge of local road conditions and a lack of understanding of local traffic rules may result in an increased risk of traffic crash involvement.
- We report the number of foreigners entering China each year using data from the National Bureau of Statistics of the People's Republic of China.
- To evaluate the RTIs of foreigners in China, we analyzed 2000-2008 data from the Bureau of Traffic Management of Ministry of Public Security of the People's Republic of China.
- The number of foreigners entering China has increased 2.4 times over the study period.
- From 2000- 2008, the number of fatalities among foreigners increased 2.5 fold. Nonfatal injuries during this same time frame increased by a magnitude of 1.8 (126 nonfatal injuries in 2000 to 223 in 2008.)

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Figure 1.
Motor vehicles in use in China, 2000-2008.

Table 1

Foreigners entering China by year

Year	Foreigners (millions)
2000	10.16
2001	11.23
2002	13.44
2003	11.40
2004	16.93
2005	20.26
2006	22.21
2007	26.11
2008	24.33

Data source: National Bureau of Statistics of the People's Republic of China

Table 2

Road traffic injuries to those of foreign nationality in China, 2000-2008

Year	Fatalities			Nonfatal Injuries		
	Total	Foreign	%	Total	Foreign	%
2000	93853	19	0.020%	418721	126	0.03%
2001	105930	33	0.031%	546485	197	0.04%
2002	109381	44	0.040%	562074	225	0.04%
2003	104372	23	0.022%	494174	217	0.04%
2004	107077	32	0.030%	480864	192	0.04%
2005	98738	40	0.041%	469911	198	0.04%
2006	89455	54	0.060%	431139	302	0.07%
2007	81649	40	0.049%	380442	201	0.05%
2008	73484	48	0.065%	304919	223	0.07%

Data source: Bureau of Traffic Management, The Ministry of Public Security of the People's Republic of China