



The prevalence of speeding and drink driving in two cities in China: a mid project evaluation of ongoing road safety interventions

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ABSTRACT

Road traffic crashes in China kill in excess of 250,000 people annually, more than any other country in the world. They are the fourth leading cause of premature death in the country and are responsible for 2.4% of the burden of non-fatal health loss in the country. Interventions to curb speeding and drink driving are being implemented in the cities of Suzhou and Dalian since late 2010. We evaluated the ongoing effect of these activities through five roadside surveys, seven rounds of observational studies, and analysis of crash statistics in the two cities. We find that thus far, the prevalence of speeding has not reduced in either city with the notable exception of one site in Dalian, where the percentage of speeding vehicles declined from nearly 70% to below 10% after an interval-based speed enforcement system was installed. The broader deployment of such speed control technologies across China and other countries should be explored. Roadside alcohol testing suggests that prevalence of drink driving prevalence (i.e. BAC >20 mg%) declined from 6.4% to 0.5% in Suzhou and from 1.7% to 0.7% in Dalian during the monitored time period. However, the measured prevalence rates are very low and should be validated against estimates based on hospital studies. Roadside interviews suggest that the population of both cities is already highly sensitized to the risks associated with drink driving and speeding. Crash statistics from the two cities do not show appreciable declines in injuries and fatalities as yet. However, the possibility of substantial underreporting in crash statistics sourced from traffic police poses a severe threat to monitoring progress towards road safety in Suzhou, Dalian and across China. There is an urgent need for China to invest in a reliable road traffic injury surveillance system that can provide information for describing key risk factors, evaluating the impact of safety policies, and benchmarking achievements.

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Introduction

Road traffic crashes killed 1.3 million people in 2010 globally and accounted for more than 3% of the total health lost due to illness and injury.^{1–3} They were the eighth leading cause of death overall, and the leading cause of death among males aged 5–29 years. While low- and middle- income countries (LMICs) have rising road traffic death rates, high-income countries (HICs), which have a long history of road safety programmes, have death rates that are lower and have been declining steadily for several decades.⁴

Road traffic injuries killed 283,000 people in China in 2010, almost double the death toll (155,000) in 1990.² The corresponding death rate, 21.3 per 100 000 population, was

more than double the death rate in Western Europe and the neighboring high-income region of Asia Pacific. Traffic crashes were the 4th leading cause of premature death in China in 2010. In addition to deaths, road traffic crashes result in substantial morbidity contributing 2.4% of the burden of non-fatal health loss in China.¹ There are more than 1.5 million people currently living with permanent disabilities in China resulting from road traffic crashes.⁵

The growth in road traffic crashes in the region has been fueled by an expansion of the road transport sector, which is closely linked with rapid economic growth.^{6,7} China, which has seen sustained economic growth averaging more than 9% annually since 1985, now houses one of the world's largest intercity expressway networks, rivaling the US Interstate Highway System.⁸ Although per-capita vehicle ownership levels are still relatively low at 0.05 private vehicles per person, the private vehicle fleet has increased by 90 times since 1990.⁹

Driven by a need to manage safety in a rapidly expanding road transport system, the Chinese government has undertaken several far-reaching initiatives to improve road safety in the

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country since 2003.^{10,11} These include the preparation of a National Road Traffic Safety Plan that included specific safety targets to reduce fatalities and crashes. In 2004, the National People's Congress, China's top legislature, passed comprehensive road traffic safety legislation.¹² The law clarified the roles of various government agencies, assigning responsibility at the national level to the Ministry of Public Security, and to the Traffic Police at the local level. The accompanying Implementation Regulations¹³ established leadership and coordinating groups, such as the Provincial and Municipal Road Safety Councils. Simultaneously, the Chinese Government significantly increased funding for road safety by financing programmes in the transport and health sectors. Notably, the National Highway Safety Enhancement Programme spent more than US\$ 1.4 billion on identifying and eliminating crash black spots between 2004 and 2007.¹⁰ In addition, a National Emergency Rescue System is being developed which focuses on the central and western provinces. Efforts have also been directed at improving infrastructure for monitoring and evaluation, such as through the establishment of the National Injury Surveillance System (NISS) in 2006.

The substantive increase in road safety activity in China has been accompanied by a parallel increase in road safety research and related academic publications. These studies highlight that police-based official statistics of road traffic crashes underreport road traffic deaths in China by a factor of three-to-six, based on comparisons with the Ministry of Health Vital Registration System and the national Disease Surveillance Points system.^{6,14–16} Studies have also focused on specific risk factors. He et al.¹¹ reviewed the implementation and impact of speed control programmes since the 2003 road safety law. They concluded that China has undertaken a large number of speed control programmes using automated enforcement technologies that have not been reported in journal publications and have not been subjected to formal evaluation. Similarly, Li et al.¹⁶ reviewed the legislations, current practices, and institutional capacities for preventing drinking and driving and concluded that the country has made substantive progress since the 2003 law by establishing strict laws, serious penalties, and rigorous enforcement programmes. Notably, Li et al. highlight that starting in 2011, new national legislation made drunk driving a criminal offense and introduced severe penalties for drink driving. These legislations have been coupled with strong enforcement across the country. Nevertheless, they concluded that effectiveness of these programmes cannot be formally assessed due to the absence of reliable data, a problem that has also been highlighted by other authors.^{6,14}

In addition to this growing national focus on road safety in China, there has also been international interest in addressing the problem. In 2010, a consortium of partners received funding from the Bloomberg Philanthropies for a road safety project that aimed to improve road safety in 10 low-and-middle income countries including China.^{17,18} In China, the project aims to support the government in implementing locally appropriate and sustainable programmes on the prevention of road traffic injuries and deaths through enhanced enforcement of legislation and social marketing campaigns. A central focus of these efforts is to reduce drink driving and speeding in the cities of Suzhou and Dalian. The intervention activities include recommending improvements of existing road safety policies, strengthening law enforcement capacity, educating the general public through social marketing, and building the capacity on road safety among local professionals. The following activities of this project are of particular note:

- 2011: March to November: General awareness raising campaigns on the risks of drink driving and speeding were undertaken in both cities. The primary focus of these activities

was on health education, advocacy and communication through various mass media outlets.

- 2012: September to November: A 100 day social marketing campaign related with drink driving was implemented in Suzhou and was accompanied with increased police enforcement activities. A campaign titled “Slow Down – Save a Life” was implemented in Dalian.

In this paper, we report on the current (mid-project) status and the impact of these drink driving and speeding interventions in Suzhou and Dalian. We assess the changes in knowledge, attitudes, and practices of people towards drink driving and speeding in the two cities as reported in periodic roadside interviews. We evaluate changes in the prevalence of drink driving and speeding in the two cities as measured in periodic observation studies. Finally, we assess the change in road traffic crashes and injuries reported by traffic police in the two cities. Thus, we attempt to evaluate whether the introduction of the interventions are leading to road safety improvements in the two cities.

Data Collection Methods

We collected primary data in Suzhou and Dalian via observational studies and roadside knowledge, attitude and perceptions (KAP) surveys of drink driving in Suzhou and Dalian. The Institutional Review Board (IRB) at the Johns Hopkins Bloomberg School of Public Health and the China CDC approved all primary data collection in this study. In addition, we obtained secondary data on injuries from the local traffic police. Our data collection began shortly after the programme began in late 2010 and was conducted periodically thereafter (Table 1).

We measured trends in prevalence of drink driving by conducting periodic observation studies in conjunction with ongoing police enforcement activities in the two cities. Police conduct regular enforcement activities by setting up roadblocks and administering breathalyzers to measure blood alcohol content (BAC) levels of vehicle drivers that the police suspected might be driving under the influence of alcohol. Trained researchers from the local China CDC offices worked with police at these enforcement sites to record the number of drivers stopped, the number of “drink drivers” (defined as those with BAC between 20 mg% and 80 mg%) and the number of “drunk drivers” (defined as BAC >80 mg%). Over the course of this project, the police enforcement sites have shifted from targeting locations of high prevalence of drink driving (such as near bars and restaurants) to sites that are more randomly distributed across the city. We conducted seven rounds of measurements in each city usually between 7 pm and midnight between February 2011 and August 2012, and collected information on over 45,000 drivers (Table 1).

Similarly, we measured trends in speeding by conducting periodic observation studies at eight sites in Suzhou and six sites in Dalian. The sites were picked to allow for a range of road-types (urban and peri-urban, varying speed limits, divided and undivided) and geographic locations across the two cities. The precise locations of sites on these roads were chosen so that vehicle speeds would be primarily an outcome of driver choice and not affected by environmental conditions. Thus, these were chosen to be far from speed impediments (such as due to the presence of a bus stop, or due to active driveways with turning vehicle). At each site, trained researchers used radar speed guns to record vehicle speeds of all vehicles during a certain period of time. Researchers worked with police in order to comply with local road laws and for safety. In Suzhou, all measurements were conducted using a police-owned tripod-mounted radar gun and video recorder that transmitted speed and images

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