2014 Vanderbilt Global Health Case Competition

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Case Document

Road Traffic Injuries in Urban Vietnam

Presented by:

VANDERBILT

Institute for Global Health

Student Advisory Council

"Over a million people die each year – the equivalent of a jumbo jet crashing every day – from road traffic injuries around the world. Millions of people become injured or disabled…while many more suffer the impoverishing economic and social impact both in the short and the long term. A large majority of these deaths and disabilities occur in low- and middle-income countries…the world has not given enough attention, policy support, and dedicated investment for stemming and controlling this 'epidemic.'"[1]

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Road Traffic Injuries in Urban Vietnam

Materials in this packet

1) 2014 Vanderbilt Global Health Case Competition problem statement
2) Instructions for teams
3) Judging rubric
4) Background information on road traffic injuries in urban Vietnam
5) Research Citations

Objectives of this packet

Use the information in this document to obtain a broad understanding of the dynamic health and infrastructure challenges in Ho Chi Minh City (and Vietnam more broadly), to stimulate group thinking of intervention strategies, and as a starting point for your team's research and presentation planning process. Road traffic safety is a complex and multifaceted issue, and this packet is not intended to be a comprehensive review of the subject, nor should it limit your scope of thinking around possible solutions.

Problem Statement

Current statistics indicate that over one million people die annually from road traffic injuries, and, if action is not taken to reverse the trend, this death toll is projected to triple by 2030.[2,3,4] Vietnam has one of the highest road traffic death rates in the Western Pacific Region, and, according to the United States Department of State Crime and Safety Report, two of the most dangerous activities in Ho Chi Minh City (HCMC), Vietnam are daily, unavoidable occurrences: crossing the street and driving or riding in traffic.[5]

There are a number of proven interventions to reduce the burden of road traffic accidents and injuries, including preventative strategies that target road user behavior, improved infrastructure, enhanced safety features of vehicles, and the incorporation of road safety features in land use and transport planning. Other post-crash approaches, such as high quality emergency response systems, facility-level trauma care, and injury rehabilitation, are effective.

The United Nations (U.N.) General Assembly designated 2011-2020 as the Decade of Action for Road Safety, and chose Vietnam as one of its focus countries. The U.N. Resident Coordinator in Vietnam has released a country-level request for proposals to award a one-time grant for seed funding for a social enterprise* with a creative and measurable intervention that could have a significant impact on the issue of road traffic safety in Ho Chi Minh City. U.N. partners, including emergency medical responders, social entrepreneurs, and civil engineers from HCMC will convene to hear the enterprise pitches, review the recommendations, and ultimately select the most feasible proposal to provide start up funds to one group's business.

*For more information on social enterprise, see appendix 4.

Instructions

Drawing upon your team's research and expertise, **your task is to develop a business plan for a social enterprise that will address one or more aspects of road traffic safety. Your pitch should be based on the needs you identify in Ho Chi Minh City, but have potential to be scaled to other urban areas in Vietnam and Southeast Asia. Your group will have up to $3 million USD in seed funding, which can be spent over a period of four years. Your plan must demonstrate self-sustainability after the four years.**

Working together with your multi-disciplinary team of 4 to 6 people, create a **12-minute**, in-person, oral presentation with supporting slides to respond to this request for proposals from the U.N. Resident Coordinator in Vietnam. One or more members of the group can deliver the presentation, but all members must attend and be available to respond to questions. There will be 5 minutes of question and answer immediately following your pitch. Please cite all sources and include a slide with references, which you do not need to cover during your presentation.

All slide decks must be appropriately labeled with your team number and submitted via V-Share by 12:00 p.m. sharp on Saturday, February 8, 2014. Late entries will NOT be accepted.

We encourage each team to bring 3 copies of their slide deck for members of the judging panel. No printing is available at the site of the competition. Please conserve paper by printing on both sides and placing 3 or 4 slides per page.

Judging Rubric

It is important to include information regarding your use of the seed funding and financial projections for your business, but the judges will not heavily evaluate your proposal based on the sophistication of these analyses. While they will take this information into consideration, they will look more closely to the effectiveness, sustainability, and cultural acceptability of your proposed course of action. Your recommendations should be specific, executable, and clearly address a transportation-related health problem. During the 5-minute question and answer session immediately following your presentation, be prepared to answer questions that may force you to think on your feet. In evaluating proposals, judges will consider the following:

Category	Points Possible
Strategy, Rationale, & Justification • Logical approach • Use of data and evidence • Plan for goals and outcome assessment • Sustainability • Efficient use of finances & resources • Potential for expansion/growth	25
Case Specific Information • Addresses how proposed solution alleviates critical global health issue(s) • Cultural acceptability • Feasibility with regard to financial, human resource, and time constraints	25
Clarity & Organization • Definition of problem • Goals of proposed solution • Analysis of strengths, weaknesses, opportunities, and challenges	20
Innovation • Integrates multiple disciplines • Creative use of resources • Reflects "outside-the-box" thinking	20
Delivery • Visual aids (PowerPoint, Prezi, etc.) • Oral presentation: Voice, body language, and eye contact • Command of Q & A	10

I. Introduction

Despite being largely preventable, over 1.2 million people die annually from road injuries—more than 3200 deaths each day—and an additional 20 to 50 million people are injured, millions of whom remain disabled for life. Traffic injuries are the 8th leading cause of death worldwide, and the primary cause of death for young people aged 15-29 years.[2,3] If action is not taken to reverse this trend, the annual death toll is on course to triple by 2030.[4]

Ninety-two percent of road traffic deaths occur in low- and middle-income countries, even though they have only 53% of the world's registered vehicles.[6] For many of these nations already facing significant challenges within weak health systems, injuries represent a 'triple burden of disease' after communicable and non-communicable diseases.[7] Comparisons between high- and low-income countries suggest that between one and two million deaths, including a substantial portion of road traffic deaths, could be prevented in severely injured patients through improved trauma systems.[8] These injuries lead to considerable economic losses for victims, their families, and nations as a whole due to the cost of treatment (including rehabilitation and incident investigation), reduced or lost productivity for those killed or disabled by their injuries, and for family members taking time from work or school to care for the injured. National estimates show that road traffic crashes cost low- and middle-income countries $65 billion USD—more than all incoming development aid[9]—and 1–3% of their annual gross national product.[10]

In Southeast Asia, injuries account for 11 percent of deaths, compared to 6 percent of deaths in high-income countries.[11] The rate of death from road traffic injuries in this region is a staggering 17.6 per 100,000 persons, over 70 percent higher than the rate for persons living in high-income countries. The global burden of injuries is projected to increase; it is estimated that injuries from road traffic accidents will be the fifth leading cause of death worldwide by 2030.[11]

II. Transportation-related injuries as a growing concern in Vietnam

Like many Asian countries, roads in Vietnam are filled with a variety of users, including pedestrians, bicycles, motorcycles, trucks, minibuses, buses and cars. Over the past two decades, Vietnam has experienced rapid economic growth, and the country's poverty rate has fallen from nearly 60 percent to 20.7 percent.[12] Vietnam has seen rapid urbanization accompanied by an explosive increase in motorization during its transformation from a least developed to a middle-income country.

The road traffic system in Vietnam is characterized by a high number of motorcycles; 95 percent of the country's 32 million registered vehicles are motorized two- or three-wheelers.[13] Private vehicles represent a large proportion (93 percent) of total journeys in Vietnam compared to the region (19.1 million non-pedestrian journeys per day), which can be broken down between motorcycles (78 percent of urban trips), cars (1.2 percent of urban trips), and bicycles (14 percent of urban trips).[14] In other nations at similar stages of economic development, the bus typically accounts for 50 to 60 percent of journeys, walking and bicycle roughly 20 to 30 percent, and private automobile and motorcycle the remaining 20 to 30 percent.[15]

The road systems in Vietnam's growing urban areas are chaotic, and traffic laws are widely ignored. Police officials admit that they have a considerable problem controlling the steadily growing number of motorcycles and vehicles. The lack of open sidewalks and adequate traffic controls create a precarious situation for both pedestrians and motorists.[5] While poor infrastructure and enforcement have contributed to high rates of traffic accidents, even improved road conditions can be problematic. National highways have led to higher speed traffic, and, consequently, to an increase both in the frequency of crashes and the severity of resulting injuries. Measures to improve physical road safety, including road lane allocation, paving of shoulders, and installation of traffic signs, signals, and pedestrian crossings, remain inadequate.[16]

As a result, the number of traffic injuries and deaths in Vietnam is drastically increasing. Between 2006 and 2010, the Ministry of Health reported 15,000 to 18,000 road traffic deaths each year, compared to 6,394 deaths in 1998.[17] More than 30 people die on Vietnam's roads every day, making road traffic injuries one of the country's leading causes of death and among the top five leading contributors to disability-adjusted life years (DALYS).†[7] However, there is no regulation in Vietnam for labeling a cause of death as 'death by traffic accident' when the death occurs several days after the incident. As such, the number of fatalities may not be completely reported.[16]

III. At a glance: Ho Chi Minh City (Saigon), Vietnam

Located in the southeastern region of Vietnam near the delta of the Mekong River, Ho Chi Minh City (HCMC), formerly Saigon, is the largest city and commercial hub of the country. Saigon was the capital of South Vietnam until the fall of Saigon on April 30, 1975, marking the end of the Vietnam War. The former capital then merged with surrounding districts and was officially renamed Ho Chi Minh City, although the name Saigon is still commonly used.[19]

HCMC, christened by the French as the 'Pearl of the Orient,' covers 809 square miles (2,095 sq. km) and is organized into 24 districts.[20,21] The city is primarily built on marshland of the large river delta, with over 60 percent of the administrative area located below 2 meters above mean sea level, making it highly susceptible to flooding and vulnerable to climate change.[15,20]

HCMC contains roughly 8 percent of the total population of Vietnam and is on the brink of consideration as a megacity, with an official reported metropolitan population of 7.4 million people.[22] This figure likely significantly underestimates the true population since as many as 2 million migrant workers are thought to live and work in HCMC for most of the year, but maintain registration in their home province.[21] According to government statistics, the population of HCMC has grown at an average rate of 3.5 percent per year for the last decade, but this figure would be closer to 5 percent if it included undocumented migrants and urban sprawl.[21] It is

†DALY is a metric representing overall disease burden. One DALY is considered one lost year of "healthy" life. The sum of DALYs across a population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability. DALYs are calculated as the sum of the Years of Life Lost (YLL) due to premature mortality in the population and the Years Lost due to Disability (YLD) for people living with a health condition or its consequences.[18]

estimated that, even with HCMC's population approaching 10 million, there are fewer than 800 traffic enforcement police on duty.[5]

The city serves as the economic and financial hub of the county. The Vietnamese economy has grown at an average annual rate of 7 percent over the last decade, but HCMC's economy has grown roughly 50 percent faster at an annual rate around 11 percent. The area in and around HCMC has captured over 55 percent of Vietnam's total foreign direct investment, demonstrating the concentration of production in this metropolis.[23]

Recognizing the increasing transportation demands in the city, the People's Committee of HCMC approved a master plan in March 2008 to guide the city through 2025. The list of proposed projects is so ambitious—including four elevated expressways and six mass rapid transit lines—that it is unlikely that it can be completed on schedule. Moreover, there is little reason to believe that the current proposal will not suffer the fate of its predecessor, which was never implemented, in part because the agencies responsible lacked technical capacity and political support.[21]

IV. Overview: Medical Workforce and Emergency Medicine

Vietnam's health care system suffers from a shortage of qualified physicians and health professionals, from primary care providers to specialists, especially at the district and provincial levels.[24] Vietnam has a ratio of 12.2 physicians (generalists and specialists) for every 10,000 population,[‡] and these trained health workers are primarily concentrated in urban areas. According the Ministry of Health, 50 percent of Vietnam's health professionals work in cities, where only 30 percent of the country's population resides.[25]

Vietnam's medical education system itself is one obstacle to overcoming the shortage of health professionals. A national licensing exam makes it difficult to ensure that a nation-wide standard of quality exists, both at the medical universities themselves as well as amongst the doctors graduating from them.[26] Residency training is highly competitive and only available to a small number of students. In addition to needing high examination scores and outstanding credentials, applicants must also have graduated in the past year, possess a degree from a reputable institution, and be less than 27 years old.[26] Providers with training in Emergency Medicine are particularly rare—Emergency Medicine was only recently recognized as a medical specialty with the introduction of its residency program at Hue College of Medicine in October 2010.[27]

A 2008-2009 study concluded that the high number of traffic-related deaths occurring on site or en route to the hospitals in Vietnam could be due to "the absence or failure of first-aid and pre-hospital stabilization of patients, with delays in response time and delayed access to life-saving trauma care."[17] The authors recommend a policy overhaul to establish more effective emergency transport services, public education on vehicular safety, research into head injury mortality among motorcyclists, and analysis of speed, vehicle quality, condition of the roads, and traffic laws to combat road traffic mortality.[17]

Global support for surgical, anesthesia, and emergency specialties including injury care, has

[‡]For comparison, the average ratio in the United States is 24.2 physicians/10,000 people.[25]

received less attention when compared to other medical specialties.[28] A World Health Organization (WHO) workshop held in collaboration with the Ministry of Health, (MoH) in Vietnam convened to strengthen capacities of health personnel through the integration of the WHO project on Emergency and Essential Surgical Care (EESC) with links to MoH programs. This meeting stimulated policy makers and health providers to integrate WHO best practice guidelines for improving the quality of emergency surgical interventions at tertiary, secondary, and primary levels of care.[29] A report from the workshop emphasized the need for a standardized training in life saving emergency and surgical interventions to reduce death and disability.[29] The Ministry of Health pledged to open more local clinics with training on the management of bleeding, breathing, shock, and resuscitation in line with the increasing burden of road traffic injuries.[29] International non-governmental agencies have been a strong voice in calling for greater efforts to improve emergency medical services in Vietnam.

V. Risk Factors for Road Traffic Accidents and Injuries

Drunk Driving

Curbing drunk driving has become a prominent focus of the transportation safety measures in Vietnam. Alcohol consumption, particularly beer drinking, is a deep seeded tradition within the social and business culture of Vietnam and Southeast Asia, a demand met by a growing number of domestic and international breweries.[30] There are few warnings for consumers against the hazardous effects of operating motor vehicles after consuming alcohol—only four foreign beer companies print a warning against drunk driving on their label, and the print is so fine that it can only be read through a magnifying glass. No local or domestic companies place any warnings on labels.[30]

Drunk driving is a critical contributor to the poor traffic safety in Vietnam. The country's National Traffic Safety Committee found drunk driving to be directly involved in approximately 40 percent of traffic fatalities in 2013.[30] Of those victims hospitalized as a result of traffic accidents, up to 60 percent are found with a blood alcohol content (BAC) level exceeding 0.05 (equivalent to 50mg/100ml).[23] Vietnam's laws for drinking and driving are not lax; the BAC threshold for car drivers is zero, and for motorbikes it is 0.05.[30] The country's government stiffened drunk driving laws in 2012, with penalties now around VND 3 million (or $142 USD) for motorbike drivers and VND 15 million ($711 USD) for car drivers.[23,30] However, there are poor enforcement and low levels of compliance to these regulations; the Global Road Safety Partnership, a non-profit leveraging multi- and bi-lateral development agencies, governments, businesses, and civil society organizations to support multi-sector road safety, ranks Vietnam 3 out of 10 in terms of its level of enforcement against drunk driving.[23,31] One study found low knowledge of safe and legally permissible alcohol use, low perceived risk of drinking and driving among Vietnamese males, and a low rate of disapproval of drink-driving from peers and family.[34]

Mobile Phone Use

Though a pertinent safety issue, distracted driving has not received as much media or policy attention as drunk driving.[33] In recent years, Vietnam has seen a rise in cell phone use while driving, including talking on the phone and texting while on motorbikes. Vietnam's youth population is primarily responsible for this phenomenon, spurred by a technology boom and the prevalence of smart phones.[33,34] The WHO states that mobile phone use while driving can lead to a fourfold increase in the likelihood of an accident; however, there is not substantial local

research into the effects of cell phone usage while driving within Vietnam specifically.[12,16] Traffic laws prohibit cell phone use while driving, regardless of whether it is a hand-held or hands-free device.[23] Penalties for using cell phones are scant, with fines ranging between VND 40,000-60,000 ($1.90-2.84 USD), and Vietnamese are generally unconcerned with laws criminalizing cell phone use since these fines and punishment are relatively insignificant.[33,34]

Speeding

The urban speed limits in Vietnam typically range from 30 to 40 km/hour (or 19-25 miles/hour), and rural speed limits are usually 40 to 60 km/hour (or 25 – 37 miles/hour). However, there is little adherence to these speed limits in both urban and rural settings. Speeding fines recently increased, but lawmakers fear increases in officer corruption by accepting bribes for not issuing tickets.[35]

Road Infrastructure

The World Economic Forum's 2010 Global Enabling Trade Report rated Vietnam 103 out of 125 countries for availability and quality of transport infrastructure. Vietnam has over 180,000 kilometers of roadways, but they are in poor condition. Eighty-four percent of Vietnam's national roads are currently paved; however, there is no data on the state of provincial and local roads. National roads in Vietnam often only have two lanes. Another prominent issue is the scattering of nails and other sharp debris on the roads, and the enforcement of fines and penalties for these offenses are lax. While tollbooths are being installed in the larger cities to increase maintenance revenue, the implementation has been poor due to budget concerns and weather issues.[36]

Motorbike Use

Between 2000 and 2007, the number of motorcycles in Vietnam tripled from 6.4 million to 20.2 million, equivalent to a national ratio of one motorcycle for every four people. HCMC, being more affluent, had 3.4 million motorcycles by the end of 2007, or one for every two people. As early as 2002, 92 percent of all HCMC households owned one or more motorcycles, giving it the nickname of the "motorcycle capital of the world."[21] Motorcycle-dominated traffic flow is distinctly different from four-wheel dominated traffic due to the motorcycles' flexibility, maneuverability, and tendency for non-lane-based movements.[37] Motorcyclists (along with pedestrians and bicyclists) are more vulnerable to injury and death because their safety equipment is not as adequate as equipment for car drivers.[16] In the evenings and on weekends, it is common to see families of four or five piled onto one motorbike, typically with one child in front of the driver and the remaining children squeezed in between the driver and the spouse.[15]

Motorbike Helmets

The protective abilities of helmets for motorcycle riders are well researched and documented.[38,39] One study that generated a sample mortality surveillance system for Vietnam found head injuries to be the most common cause attributable to road traffic injuries overall (79 percent) and to motorcycle crashes in particular (78 percent). From 1995 to present day, Vietnam has actively developed legislation for reforming issues of road safety specifically aimed at helmet use (see Appendix 3).[17]

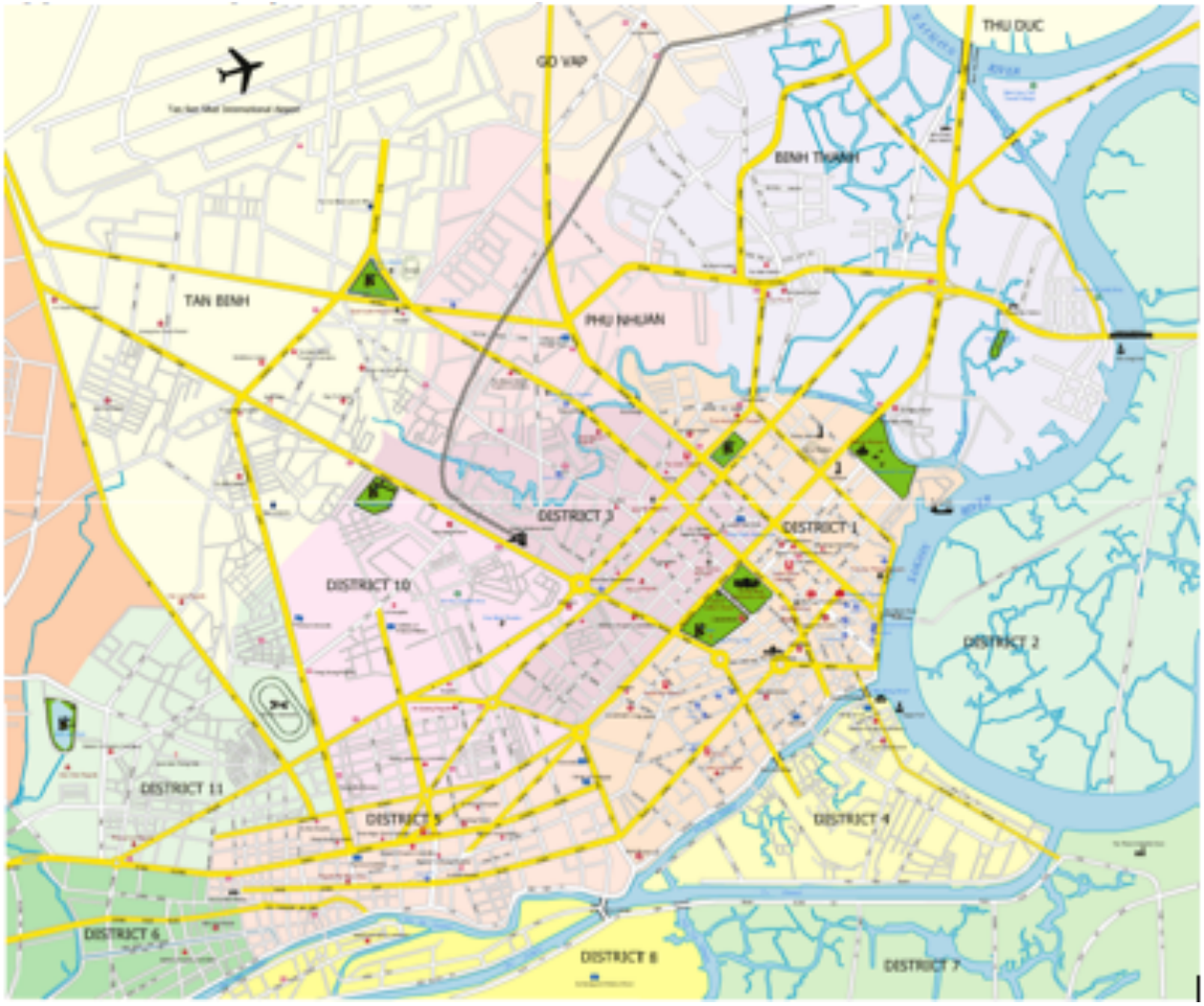
Despite the number of citations made by Vietnamese traffic police, the legislation on helmet use contains several important loopholes, rendering it less effective for important demographics. It was not until November of 2008 that traffic patrol officers could cite a rider for wearing an

unfastened helmet with the same penalties as a rider with no helmet at all.[40] Laws outside of the helmet legislation prevented fines from being levied against children or the adults accompanying them for infractions, making it in essence impossible for the current legislation to protect children.[41] Pervin et al., (2009) found that helmet use among adults ranged from 90-99 percent, but only between 15-53 percent for children aged seven and fourteen and 38-53 percent among children less than seven years old. While legislative loopholes may have contributed to these low rates of compliance, other public health misunderstandings may have also had an impact. Sixty-seven percent of parents stated fears over neck injury as a reason for not requiring or encouraging their children to wear helmets, a concern that took precedence over fears of citation for helmet-related infractions.[41] To further complicate the matter, the Vietnamese market is flooded with inadequate or poorly constructed helmets—80 percent of helmets in the Vietnamese market do not meet the standards set by the Consumer Safety Association.[29]

With such an immediate need for intervention, representatives from the U.N. Resident Coordinator's Office in Vietnam look forward to hearing your prospective solution on Saturday, February 8, 2014.

Appendices

Appendix 1: Map of Ho Chin Minh City's Inner Districts



Source: Government of Vietnam Tourism Office

Appendix 2: Challenges and Barriers to Road Safety and Trauma Care

	KNOWLEDGE	ATTITUDE	ENGAGEMENT	MANAGEMENT	CAPACITY	INFRASTRUCTURE
GOVERNMENT (ALL SECTORS)	Limited knowledge of road safety interventions	Unaware that road safety is a government problem	Lack of political will Corruption	Absence of lead agency Investment in ineffective campaigns	Inadequate finances Under-funded police forces	Lack of systematic planning of transport systems
HEALTH	Unclear estimates of burden of trauma on health sector	Road safety not perceived as a health sector issue	Health is not a partner in larger transport and infrastructure development programs	No systems approach to road safety and trauma care Silo management of activities by different sectors	Inadequate post-crash care Growing costs of trauma care Under-funded rehabilitation services	Lack of national policies and programs on trauma care Lack of integrated trauma facilities No EMS system
COMMUNITY	Limited knowledge of first aid	Fatalistic attitudes	Need for CSOs/NGOs to take ownership of road safety initiatives	Few CSOs focused on road safety	Lack of training for CSOs/ NGOs in RTI prevention and post-crash care	Rapid urbanization → increased demand on infrastructure and car dependency
ACADEMIA	Lack of translational and cost data		Resistance/barriers to engaging with policy-makers and government		Road safety research poorly funded	
PRIVATE SECTOR		Focus on business case for engagement	Lack of corporate social responsibility to improve road safety	Non-standardization of safety regulations Weak local safety standards Industry competition → de-specification of safety features		Surge in demand for cars

CSO: civil society organization, EMS: emergency medical service, NGO: non-governmental organization

Source: Hyder et al., 2013

Appendix 3: History of Helmet Legislation in Vietnam

Date legislation introduced	Authority	Legislation	Description and major revisions on previous legislation
29 May 1995	GOVN	Decree 36	Introduced helmet wearing but prescribed no penalty for non-helmet wearing
10 Aug 2000	MOT	Circular 312	Helmet wearing compulsory on upgraded highways leading to Hanoi, Hai Phong, Da Nang and Ho Chi Minh City
2 Mar 2001	GOVN	Resolution 02	Helmet wearing compulsory on all regulated roads for all people on motorbikes, from June 2001
16 May 2001	MOT	Circular 08	Helmet wearing made compulsory for all on motorbikes on all highways
2001	MST	TCVN 5756 & 6979	Introduced helmet standards for adults and children
13 July 2001	GOVN	Decree 39	Fines of 20 000 VND (US$ 1.12) for not wearing a helmet on regulated roads
8 Jan 2003	MOT	Circular 01	Helmet wearing made compulsory for all on motorbikes on all specified roads
19 Feb 2003	GOVN	Decree 15	Fines of 10 000–20 000 VND (US$ 0.56–1.12) for not wearing a helmet on regulated roads
15 Dec 2005	GOVN	Decree 152	Fine for not wearing helmets increased to 20 000–40 000 VND (US$ 1.12–2.24), plus confiscation of the offender's motorcycle for 3 days.
29 Jun 2007	GOVN	Resolution 32	From 15 December 2007, helmet wearing made compulsory for all motorbike riders and passengers on all roads.
14 Sep 2007	GOVN	Decree 146	Regulated that riders and passengers not wearing helmet would be penalized 100 000–200 000 VND (equivalent to US$ 6.25 – 12.5)
14 Oct 2008	MPS	Circular 23	Confirmed an unfastened helmet was considered non-wearing from enforcement perspective
28 Apr 2008	MST	Decision 4	Strengthening of provisions for quality assurance inspection of helmets to ensure they meet national standards
2008	NPA	Law 23	The new road safety law mandated that all riders and passengers must wear and fasten helmets. The new law took effect from 1 July 2009

GOVN, Government of Viet Nam; MOT, Ministry of Transport; MPS, Ministry of Public Security; MST, Ministry of Science and Technology; NPA, National People's Assembly; VND, Viet Nam Dong.

Source: Passmore et al., 2010

Appendix 4: Background on Social Enterprise

Social enterprise is, "the use of nongovernmental, market-based approaches to address social issues."[45] Considered to be businesses, social enterprises utilize the marketplace to advance their social, environmental, and human justice agendas while maintaining an ever-present focus on the common good.[46]

Not to be confused with traditional nonprofits, social enterprises focus directly on social needs through the creation of goods and services or through the employment of disadvantaged populations.[46] These entities rely primarily on earned revenue for organizational sustainability and may also receive external funding through grants or donations, but the business's commercial activity remains its most substantial income and source of self-sufficiency.[46] Social enterprises exist to serve a particular mission, and this desire to serve a common good remains the essential concern for these businesses.[46] As such, their primary goal is not that of profit; rather, their motivation and interest is rooted in their mission, which is generally determined either by stakeholders or the community.[47]

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