

Gaps in Addressing Road Safety in the Philippines

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RESEARCH ARTICLE

Abstract

Background and Objective: Road traffic injuries were the second leading cause of death due to injury in 2003 in the Philippines. In 2011, the Philippine Road Safety Action Plan (PRSAP) was instituted. Five years into the program, latest data showed that the death rate due to road injuries continue to increase despite the presence of key legislation supporting road safety. This study was aimed at identifying the gaps in addressing road safety in the Philippines.

Methodology: Literature review and key informant interviews of representatives of the different agencies including the Department of Transportation and Communications (DOTC), Department of Public Works and Highways (DPWH), Road Board, Philippine National Police (PNP), Metro Manila Development Authority (MMDA), and Land Transportation Office (LTO) were conducted to identify gaps in the program.

Results and Conclusion: Key gaps include: weak leadership at the national and local level, limited material and human resources for enforcement of laws, and fragmented information system. These gaps should be addressed to improve the road safety situation in the country.

Keywords: road safety, safety policy, Philippines, developing countries

Introduction

Road traffic injuries (RTI) are a major public health problem with considerable economic consequences. According to the World Health Organization (WHO), it is the 8th leading cause of death globally and the leading cause of death in the young aged 15-29 years old [1]. It is predicted to become more significant in the future, becoming the third leading cause of death by 2020 [2]. It is the reason for around 25% of deaths in the world translating to 1.24 million lives lost in 2010 [1]. In 2005, 40.7 million disability-adjusted life years and 167.67 billion US dollars were the estimated losses worldwide due to RTI [3].

Regional data suggest that middle income countries bear the majority (80%) of road traffic deaths despite accounting for only 52% of the registered vehicles in the world [1]. Low-middle income countries, such as the Philippines, experience the greatest burden in Disability-adjusted life years (DALY) loss although economic losses are lower compared to high income countries [3].

Data on RTI in the Philippines is limited to a handful of studies which reviewed hospital records and surveillance data

covering only major highways or selected hospitals. Despite this, the evidence suggests that RTI poses a significant health problem. Road traffic injuries were the second leading cause of death due to injury in 2003 [4]. In 2008, there were 7.7 deaths due to RTI per 100,000 population [1]. The Department of Health (DOH) reported that in national roads, there were 5,870 non-fatal injuries and 1,185 deaths in 2003 [4].

In order to address this issue, the Philippines instituted its own National Road Safety Action Plan. The Philippine Road Safety Action Plan (PRSAP) was formulated during a multi-sectoral meeting held in Tagaytay in 2011. The goal of the plan was based on the Global Road Safety Action Plan's goal: reduce by half the road traffic death rates in the Philippines by 2020. Halfway through the program, a review of the major accomplishments is warranted to assess if the goals are being achieved.

The plan utilized a multi-sectoral approach and is divided into five thematic pillars. Each pillar contains detailed activities (or Sectors) needed to achieve the goal. Pillar 1 contains activities on establishing information systems, road safety funding mechanisms, and research. Pillar 2 and Pillar 3 are

focused on establishing and implementing safer designs for roads and vehicles, respectively. Pillar 4 is on education of the public with a special focus on children, driver training, and law enforcement. Pillar 5 is towards improving the trauma system in the Philippines.

No formal assessment of the implementation has been done. The latest study available on road injury epidemiology was an unpublished study done by Lam *et al.* [5] which suggested that the plan has little to no impact on road safety in the Philippines. The rate of injuries reported by the police has remained constant from 2011 to 2013 while the rate of deaths reported in the police showed to be increasing over the three-year period. Long-term plotting of data is needed to confirm this trend but is indicative already that the Philippines is not moving towards the PRSAP's overall goal. This study adapted the health system framework and looked at the issue of road safety as a function of building blocks of a health system to identify reasons for lack of change in the trend.

Methodology

Key informant interviews of representatives of different agencies were conducted from 2014 to 2015. Representatives were asked regarding their activities towards road safety as well as issues they have encountered. In sum, the following agencies were interviewed: Department of Transportation and Communication (DOTC), Department of Public Works and Highways (DPWH), Road Board, Philippine National Police (PNP), Metro Manila Development Authority (MMDA), and Land Transportation Office (LTO). To supplement this, the group also reviewed presentations made during the 2015 planning for the PRSAP as well as the reports provided by the involved agencies. Literature review was also conducted. Individuals involved in road safety in Davao city and Marikina City were also interviewed. A full assessment of the trauma system as included in Pillar 5 was deemed too wide for the scope of this paper and is a limitation of this paper.

Results

Leadership, Governance and National Policies

The lead agency for the PRSAP is the Department of Transportation and Communication that is tasked to organize a multi-agency team that will meet regularly to assess the progress of the PRSAP. However, these meetings were reported to not have been conducted as scheduled. The Department of Public Works and Highways was previously the lead agency in road safety but has been relegated to leading

the efforts towards safer roads. Although DOTC is the national agency in charge of implementing the plan, bringing this down to the local level has not been achieved completely. The DOTC does not have regional offices unlike the DPWH and DOH.

In two LGUs interviewed, it did not seem that they have a sole agency for road safety or a local version of a road safety action plan. Instead, road safety-related activities are distributed across various agencies. Road safety activities are undertaken by the Public Safety Office or the Traffic Unit but it is not clear if there are teams dedicated solely to road safety or if these were integrated in other activities. For example, in Davao city, the Traffic Management Office conducts safety and emergency response education activities for community members.

Legislation related to road safety was also reviewed and compared to the recommendations of the World Health Organization [6]. The Philippines has passed national legislation for four key road safety recommendations: speeding (RA 4136), drunk driving (RA 10586), seatbelt use (RA 8750), and helmet use (10054). The Philippines also passed a law (RA 8794) that enables financing of road safety interventions through motor vehicles user's charge (MVUC) and a law that promotes the safety of children riding motorcycles (RA 10666). There are still gaps in legislation remaining. There is no law on child restraint and no law that establishes a national emergency response system.

The DOH has also issued Administrative Order No. 2014-0002: the Revised National Policy on Violence and Injury Prevention, and Administrative Order No. 2014-0007: National Policy on the Establishment of Prehospital Emergency Medical Service System. The two AOs reiterate the importance of preventing injury as part of the State's role in protecting the health of Filipinos. These orders also outline the activities that DOH needs to do to achieve these goals.

There is also a weakness in the anti-drunk driving law such that it allows only alcohol breath testing when a driver is apprehended or what is called selective breath testing. Evidence in Australia showed that the anti-drunk driving law seems to have a bigger impact if random or universal testing is used [7]. This is attributed to the increased deterrence effect on drivers if they would not know when they would be tested. However, adding this provision may be legally challenging as in the case of the United States.

However, studies that document the implementation and impact of the laws addressing these WHO risk factors and safety recommendations are scarce. The group did not find any literature when a search was conducted in PubMed

and Herdin. Health workers in hospitals included in the study reported by Lam *et al.* [8], mentioned that the common profile of a road accident victim was a drunk male driving a motorcycle and often not wearing a helmet. Surveillance data from the DOH confirm this picture especially of a high number of male RTI victims. Precise and national representative values on other risk factors, such as helmet use and alcohol use were not documented likely due to poor reporting. Anecdotal evidence and field experience by the research team suggested that the helmet use law is not well-implemented, especially in provinces.

Based on key informant interviews with the LTO and PNP, the anti-drunk driving law was facing implementation problems. Funds for procurement of the breathalyzers were limited. The law cannot also be fully implemented due to a lack of deputized officers allowed to conduct the test. The LTO, at the time of the interview, strives to address this by continuously conducting trainings of trainers and officers.

Services and Activities

Road safety activities can be roughly grouped into: road user education, engineering interventions, law enforcement, and health services. These activities are traditionally divided into four key agencies: DOTC with the help of LTO and LTFRB for driver education, DPWH for engineering interventions, PNP for law enforcement, and DOH for health services. The functions are not exclusive as some agencies conduct multiple activities.

The DOTC reported that they regularly conduct education and promotion activities. They have organized several forums for road users. The LTO and LTFRB also regularly conduct driver education activities, especially for those whose licenses were suspended for traffic violations. Recently, the LTO has developed an education material for drivers to provide a standardized source of information on road rules and regulations.

Two other agencies conduct education and training of road users. The Department of Education has a department order where road safety should be tackled as part of the Citizen Advancement Training in secondary level education (DO 107, s. 2009). Driver and pedestrian training, however, is not included in the curriculum for other levels. The Philippine National Police, specifically the Highway Patrol Group, conducts seminars and trainings for road users although this is on a per request basis. From the author's personal experience, in the past three years, there has been no mass education or mass media activities for road safety similar to the campaigns

of the Department of Health towards smoking (e.g. Yosi Kadiri) or tuberculosis.

Health services on road safety involve the continuum of care from emergency response systems to rehabilitation of injury victims. As of the moment, no national emergency response system is in place. Several LGUs have set-up their own Emergency Medical Services (EMS), sometimes with the help of NGOs, such as the Philippine Red Cross. Upgrading and setting up of trauma and rehabilitation centers are still on-going along with the development of corresponding PhilHealth package.

A major achievement in 2014 was the completion of road audits in national roads and highways by the DPWH. The audits were able to guide DPWH in terms of re-designing roads to improve safety. Audits have been completed and findings have been applied in roads in Northern Luzon. Due to successes in improving the safety ratings after the audits and interventions were put in place, a second round of audits was conducted for other roads. The Road Board also reported that they were able to fund features that will improve road safety such as road signs, street lighting, and pedestrian footbridges.

Human Resources

Unlike traditional health problems, road safety human resources also include the police and the traffic enforcers. The emergency response team also plays an important role in road safety. The importance of these agents is due to the fact that a majority of road deaths occur before arrival at the hospital. It is then of utmost importance to prevent these fatal crashes from occurring and to transport those in critical condition under the care of able responders.

The police enforce the law and often serve as first responders in emergencies. According to the PNP representative, road traffic management and safety is part of the core curriculum of the police force. Any police officer should be capable of managing traffic, apprehending violators, and securing sites where accidents occur. They also undergo first aid training to support their ability to serve as first responders in emergencies. By law, they are also the main individuals tasked to uphold traffic rules.

However, due to insufficiency in the police staff, local government units have created traffic management units to assist in traffic management. Traffic enforcers are civilians tasked to ensure smooth flow of traffic and apprehend violators within their area of responsibility. However, they are not necessarily allowed to issue tickets or send arrest violators. They must be deputized by the police or any regulatory agency before given this right. The training of

these enforcers does not seem to be standardized with each local government unit implementing its own training program with or without coordinating with national agencies. The ability to provide basic emergency care may or may not be included in the training. Studies on the behavior of police and local enforcers on road safety have not been found.

In most health emergency systems, emergency medical technicians serve as trained first respondents. In the Philippines, the job is not yet considered a profession or acknowledged by the government. In the two local governments included, when asked about their emergency medical technicians (EMTs), they were reported to be classified as nurses or administrative staff. The law to professionalize EMTs passed third and final reading in the House of Representatives but did not pass the Senate during the 14th Congress [9].

There is also a lack of standardization in training the EMTs with each agency providing its own version of the training. The two LGUs interviewed mentioned that they conduct their own in-house training. One of the LGUs sometimes consults the Philippine Red Cross and the Department of Health in terms of training their staff. The other LGU utilized foreign consultants in creating their training programs. The DOH also has created an agency to focus on the development of an emergency medical system and developing guidelines for standardization of EMT competencies.

Information System

There are multiple information systems in place in the Philippines to track road traffic deaths and injuries. The main source of road safety statistics for the PRSAP is the police records through their blotters. In the past, records would be logged in physical blotters and the DPWH would collect the data from injuries occurring in national roads using the Traffic Recording and Analysis system (TARAS). However, funding for the TARAS has stopped/ The police have rolled out the e-blotter system which allows for faster data collection by the police and captures a wide area as all police stations are covered. This new system also promotes standardization of reports decreasing the occurrence of missing data. In this system, police stations and offices can directly send their reports to the main database in the central office. However, the key informant agrees that the police records give an incomplete picture in terms of statistics. Although all collisions should be reported to the police, in practice this is not the case. Parties can settle issues without reporting to authorities and, in some cases, the police would not record the event if the parties involved agree to settle them. Another situation is when an injured individual goes straight to

the hospital and the hospital fails to report the event to the police. This phenomenon of police underreporting road injuries and deaths was documented by Lam *et al.* [8]. Findings demonstrated that the police captured only 2 to 31% of road injuries and 3 to 18% of road deaths every year.

There is another information system available for the National Capital Region: Metro Manila Accident Reporting and Analysis System (MMARAS). The MMARAS is used and maintained by the Metro Manila Development Authority. It is an electronic database but is still based on police blotters. As the name suggests, it is limited to incidents within Metro Manila. Despite its limited scope, it has been used to guide road safety programs. MMARAS data has been instrumental in identifying Commonwealth Avenue as a black spot and road safety interventions were introduced due to the data. Based on the author's experience with handling MMARAS data, it does not contain the ideal information to conduct black spot mapping. Locations are not precise enough and GPS data is not recorded in the system.

Finally, the Department of Health maintains a surveillance system for injuries called the Online National Electronic Injury Surveillance System (ONEISS). In 2014, 116 hospitals all over the Philippines participated in ONEISS recording around 40,000 road traffic injury reports. The ONEISS team releases quarterly reports on injuries in the Philippines, however, due to its limited scope, it cannot be used to generate national prevalence or incidence data. The data, however, is useful in identifying temporal and injury patterns as well as populations at risk of certain injuries.

As an effort to address the disjointed information system, the World Bank, in cooperation with DOTC, have started the development of a system that will link the existing databases and include features that will enable analyses, such as real-time monitoring and black spot identification. The system is called the DRIVERS system and has been tried in some areas in the Philippines.

Financing

Most of the funding for national road safety projects come from the Motor Vehicle User's Charge (MVUC) and is managed by the Road Board. RA 8794 stipulates that 7.5% of the MVUC is allocated for funding road safety projects such as construction of footbridges, lighting installations, and development of safe roads. The allocation for 2014 was around PhP 750 Million. Agencies involved in road safety can request for funding of their projects through the Board. The

Board will then review the proposal and allocate funds accordingly. Some of the projects the Road Board has funded include improvement of national roads and purchasing of road signs that meet international standards.

Aside from these, the DPWH and DOTC also allocate some of their funds for their own road safety activities. The LTO and LTRFB allocate funds for driver education activities while DPWH allots its own funds for road safety audits.

Local government units have multiple sources for road safety projects. They source funds from fines from traffic violations and parking fees in their city. They can also allocate some of their general budget for making safer roads. Finally, they can also request funding from national agencies, such as the Road Board for their road safety programs. It was mentioned by the DPWH representative that if DPWH or the Road Board funds a project that will be built in an LGU territory, it is the responsibility of the LGU to maintain the road or road improvements.

Discussion

Despite the acknowledged value of preventing road traffic deaths and injuries as embodied in the Philippine Road Safety Action Plan, there are no convincing evidence that the Philippines is moving towards its goal of decreasing death rates. The latest report by Lam *et al.* [5] actually showed an increasing trend in mortality rates. Important weaknesses in the system include: a weak lead agency on road safety, lack of local presence of road safety agencies, inadequate implementation of laws, inadequate number of human resources, fragmented and unreliable information system, and uncoordinated efforts especially in education. A good feature of the system is a reliable source of funding. The effort to improve roads through better design is also commendable. (Table 1)

The World Report recommends that a lead agency be identified for road safety. The lead agency is important to ensure that efforts by multiple agencies and disciplines

Table 1. Positive and negative features of the road safety system

Component	Positive	Negative
Leadership and Governance	Identified lead agency Presence of multi-sectoral and multi-agency involvement Laws available	Irregular meetings Unclear LGU counterpart Enforcement issues e.g. lack of equipment
Information system	Systems in place Road safety audit conducted with results translated to Policy	Failure to capture whole picture Contrasting figures Safety data not used/useable for planning and policy
Financing	Budget is available in the form of MVUC. Department budgets also available.	LGU financing is unclear Fund for engineering mostly
Human resources	Police trained on road safety, implementation and first aid Mechanism in place to allow LGU staff to be enforcers/deputized	EMT is not professionalized and no standard training
Services		
a. Education	Agencies conduct regular activities	Limited scope; no assessment on effectiveness No nationwide efforts Not in standard education curriculum
b. Health	Model EMS for LGUs available	No national system and standards No legislation supporting EMS

are coordinated and that interests of each agency do not overwhelm the overall goal of achieving road safety [2]. Although an agency has been identified, the effectiveness of the agency is unclear. The agency has been able to establish a network of road safety network advocates both from government and non-government entities. However, a sign of inadequate leadership is the lack of regular meetings between involved agencies. The current devolved system also limits the lead agency's reach as LGUs continue to work with much independence from it.

The Road Safety report estimated that certain key laws must be present to achieve road safety. Research has demonstrated that laws have led to decreases in road injuries and deaths [1,10–12]. In the Philippines, the existence of a law is necessary but not a sufficient factor for road safety. The impact of the laws is unclear and suggests a problem of implementation and enforcement. System inputs are needed to implement existing laws, such as trained enforcers and alcohol breathalyzers. Models of implementation for random breath testing and intensive enforcement periods could be explored. The effectiveness of intensive implementation of speeding and helmet laws could be observed by looking at LGUs, such as Davao City where local ordinances are in place and enforcement is perceived to be strong.

In contrast to developed countries where road safety systems have a strong information system component, our information system is weak, fragmented, and lacking. The World Health Organization believes that surveillance is important for injury prevention because it allows countries to quantify the problem and determine the causes of these problems [13]. Reliable information is important in tracking progress and identifying areas of intervention. Successful models of information systems in low-income settings exist and should be looked into [14,15]. Mapping technology with GIS should be integrated in reporting systems to identify black spots of deaths and injuries. Black spots or hot spots analysis would allow for targeted implementation and more efficient use of resources. Through this analysis, a road with a high number of crashes and deaths can be identified and investigated further. It is efficient because instead of spreading thin the resources for law enforcement, one can assign more officers in the target road and theoretically, improve implementation. The current system can be used to do it but it will be difficult because of the use of text data instead of GIS. It has been done for Commonwealth Avenue in Quezon city and replication in other areas will likely be productive [16,17].

Education efforts were noted in almost all agencies interviewed. This is welcome as education remains an important service that promotes road safety. Evidence are plenty documenting positive impacts of education on behavior of road users and some even documented changes in risk of crashes and injuries [18–21]. However, assessments of effectiveness of Philippine education efforts were not available. And, thus, the question of whether these activities translate to behavioral change and decrease in recidivism in Filipinos remains unanswered. In terms of training drivers, a graduated driver licensing system was found to be effective in decreasing risk of fatal crash among drivers [22]. The Philippines has a similar system where drivers get a student's license before progressing to a real one with a mandatory learning period. However, it is unclear if the period is actually used for learning how to drive. Features of systems in other countries implementing a graduated system should be looked into and adopted.

Finally, safe systems and bundled interventions should be considered. Bundling interventions was found to be more cost-effective for developing countries. A cost-effectiveness model was made for Africa and Southeast Asia which showed favorable cost-effectiveness ratios of bundled interventions [23]. Single interventions were not cost-effective. This trend remains if only three interventions were bundled. The cost-effectiveness arises because bundling together interventions effectiveness increases much more than the costs as interventions tend to have similar inputs for implementation. Using data from Australia and the US, an analysis to predict the impact of safe system approach was conducted [24]. Case counts, killed or hospitalized, and killed or severely injured were estimated and then models were generated to see the impact of interventions, singly or in combinations. The odds ratio (OR) showed that interventions even alone was effective at reducing risk of getting killed or seriously injured in both Australia and the US. Interventions in combination also led to reduction. In the US, the OR of combinations vs single interventions were nearly equal while the Australia data showed that the safe system or combinations had lower OR compared to single interventions alone.

The often spoken adage that the Philippines has good laws but has weak implementation rings true for road safety. We have a plan and comply in terms of enacting key legislation. Funding for these interventions is available. However, implementing the laws and programs would need government cooperation guided by a strong lead agency to improve road safety.

Conclusion and Recommendations

The Department of Transportation should take up its leadership role and coordinate efforts towards road safety. A safe systems approach should be reflected in its activities.

Due to devolution, local counterparts for road safety should be created. The lead agency should facilitate their development and guide their activities.

Inputs for legislation implementation should be provided. The lead agency should ensure that funding agencies allocate sufficient amounts for these inputs.

Education efforts should be institutionalized and coordinated between agencies to maximize impact and improve efficiency. Evaluation of efforts should be conducted to identify best practices.

A unified information system should be established that will not just link existing databases of DOH, PNP, and local government but also provide timely and useful information. GIS data should be included in data whenever feasible. Programs and policies should be guided by this data.

PNP and LGUs should ensure the quality of the training it provides to officers. It is important to arm them with skills to be first responders. DOH should assist in providing this training.

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