



# Global Review on Road Traffic Safety and Successful Establishment of Safe School Zones

*Safe Environment for Children*

#SafeRoads4Children #SafeRoadsUG



A MEMBER OF:  
**ROSACU**  
Road Safety Advocacy Coalition Uganda

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# ABOUT HOVITA

Hope for Victims of Traffic Accidents (HOVITA) is a registered Non-Governmental Organization dedicated to prevent road deaths and injuries and caring for people bereaved and injured in road crashes. It is also a member of international organizations working to improve post-crash response

HOVITA works with the relevant stakeholders to advocate for the road crash victims' rights, bridge the gap between Insurance, Police, Hospitals, Judicially, Policy Makers and other Victim's support organization, carry out capacity building in transport and road safety-related activities.

HOVITA is a member of Safe Kids Worldwide and the Safe Kids Worldwide Alliance, whose goal is to contribute to the reduction of preventable childhood injuries by facilitating knowledge sharing, collaboration opportunities and networking among members. Safe kids work with a network of more than 400 coalitions in the United States and with Alliance Members from in more than 30 countries to reduce unintentional injuries such as road traffic injuries, drowning, falls, poisoning, etc.

## Activities Include:

1. Advocacy
2. Capacity Building
3. Road Crash Victim Support & Network
4. Child Safety Program
5. Empowerment



# Executive Summary

This executive summary provides an overview of the challenges and recommendations for establishing safe school zones in low-income countries, with a focus on road traffic safety and the protection of school children. The analysis highlights the importance of adequate funding and resources, as well as the need for a multi-faceted approach involving various stakeholders.

The data reveals that high- and middle-income countries generally have better road traffic safety records compared to low-income countries. However, low-income countries face significant obstacles in ensuring road traffic safety for school children, primarily due to limited funds available for designing, implementing, and monitoring school zone programs.

Successful establishment of safe school zones requires several crucial steps. Firstly, a comprehensive assessment of the road infrastructure surrounding schools is necessary to identify potential risks and areas for improvement. This assessment involves evaluating road design, traffic flow patterns, pedestrian infrastructure, and existing safety measures. However, conducting these assessments and subsequent analyses requires financial investment.

Once the assessments are complete, appropriate measures must be designed and implemented to enhance safety in school zones. These measures may include physical infrastructure improvements like speed bumps, zebra crossings, traffic signs, and signals. School-specific interventions like designated drop-off and pick-up areas, school safety patrols, and awareness campaigns targeting parents and students are also necessary. However, implementing these measures requires construction, installation, and ongoing maintenance funding.

Monitoring and evaluating the effectiveness of school zone programs is another crucial aspect. Regular monitoring allows for identifying potential issues, gaps in implementation, or the need for adjustments. It helps assess the impact of interventions and gather data for further improvements. However, monitoring and evaluation activities also demand financial resources, including personnel, equipment, data collection, and analysis.

Road traffic injuries are the leading cause of death among children between 0-17 years old, making the need to establish safe school zones in low-income countries even more critical. Schoolchildren are exposed to the risks of crashes, injuries, and fatalities when commuting to and from school without adequate safety measures.

Although many countries have adopted a speed limit of 30 km/h in school zones, the issue of speeding persists. Some drivers continue to exceed speed limits, endangering the safety of school children. Addressing this challenge requires a multi-faceted approach. Effective enforcement of speed limits through increased police presence, speed cameras, and strict penalties can act as deterrents. Public awareness campaigns can educate drivers about the importance of adhering to speed limits in school zones. Engaging with the community, including parents, teachers, and students, can foster a culture of responsible driving and instill respect for school zone regulations.

To successfully establish safe school zones in low-income countries, it is crucial to allocate adequate funds and resources. Governments, international organizations, and stakeholders should collaborate

to develop sustainable financing mechanisms targeted explicitly at road safety initiatives, including school zones. These mechanisms may include redirecting existing funds, exploring public-private partnerships, seeking support from international development agencies, and engaging with local communities to contribute resources.

Moreover, a comprehensive approach to road safety should be adopted, encompassing infrastructure improvements, driver education and training, enforcement measures, and public awareness campaigns. Investing in road infrastructure upgrades, such as pedestrian-friendly sidewalks, well-marked crossings, and traffic calming measures, can create safer environments for school children. Driver education programs can promote responsible behavior and reinforce the importance of following speed limits near schools. Collaboration between law enforcement agencies and schools can help enforce regulations effectively.

In summary, establishing safe school zones in low-income countries requires sufficient funding and resources. It necessitates a multi-sectoral and comprehensive approach that involves governments, international organizations, donors, communities, and other stakeholders working together to prioritize road safety initiatives, implement targeted interventions, enforce regulations, raise awareness, and continuously monitor and evaluate the effectiveness of school zone programs.

*“Based on the Global Review On Road Traffic Safety and Successful Establishment of Safe School Zones contained herein, HOVITA recommends that the MoWT reduces the current speed limit to 30km/hr in highly populated areas and school zones and work with local government authorities and the Ministry of Education and Sports to establish safe school zones and enforce speed limits in their areas of jurisdictions.”* Further recommended actions include enhancing law enforcement efforts, launching public awareness campaigns, providing capacity-building and training programs, fostering collaboration with stakeholders, investing in infrastructure improvements, conducting research and data collection, and seeking international cooperation and knowledge sharing.

By implementing these recommendations, Uganda can make significant progress in establishing safe school zones, reducing road traffic injuries among school children, and creating a safer environment for all road users. It requires a comprehensive and coordinated effort to achieve meaningful and lasting results in improving road traffic safety and protecting the well-being of school children.



# 1. Introduction

## Status Quo of Road Traffic Safety

Road traffic crashes are a significant global issue, resulting in a staggering number of deaths and injuries yearly. Approximately 1.35 million people die, and 50 million suffer injuries from road traffic crashes annually (Sharpin & Adriazola-steil, 2019; Turner et al., 2020). Alarmingly, 90% of these incidents occur in low and middle-income countries, highlighting the disproportionate burden these nations face (Sharpin & Adriazola-steil, 2019; Turner et al., 2020).

Road traffic fatalities rank among the top ten leading causes of death worldwide (Welle et al., 2018). Furthermore, vulnerable road users, such as pedestrians, cyclists, and motorcyclists, bear the brunt of these crashes, accounting for approximately 70% of road traffic deaths (WHO, 2009). The primary reasons behind these tragedies include speeding beyond speed limits, non-compliance with traffic signs, and failure to observe special zones like school areas (Bornioli et al., 2020; Grundy et al., 2009; Lambert & Venter, 2015; UN, 2019).

## Global Plan for Road Safety 2021-2030

Recognizing the urgent need for action, the Global Plan for the decade of action for road safety 2021-2030 aligns with target 3.6 of Sustainable Development Goal (SDG) 3. This target aims to reduce road traffic deaths and serious injuries by 50% by 2030 (UN, 2021; UN & WHO, 2021). Achieving this goal requires all stakeholders and governments worldwide to monitor progress and actively contribute to fostering road safety (UN, 2021).

Additionally, SDG 11, target 11.2 focuses on preventing road fatalities among vulnerable groups, particularly children, by promoting the establishment of safe, affordable, accessible, and sustainable transport systems while enhancing road safety (UN, 2021).

## Lowering Speed Limits at Children's Zones

Reducing speed to acceptable limits in areas such as school zones is crucial in preventing RTIs. Numerous studies have shown that lowering speed limits from 50 km/h or 40 km/h to 30 km/h significantly reduces the number of injuries and deaths (Bornioli et al., 2020; Brayer, n.d.; Fisher & Tune, 2010; Fridman et al., 2020; Grundy et al., 2009). Although 30 km/h is still considered high enough to cause severe injuries to children, it minimizes damages (Fridman et al., 2020; Job & Mbugua, 2017; Neki et al., 2021).

Safe school zones are paramount in protecting students from road traffic crashes. These zones require drivers to adhere to the highest level of yielding behaviour. When properly implemented, safe school zones are clearly marked with signboards at their entrance and exit points, improving visibility and awareness for motorists (Karndacharuk & McTiernan, 2019; Lambert & Venter, 2015).

## Examples of Successful Established School Zones

Numerous successful examples of established school zones exist around the world. These examples demonstrate the effectiveness of implementing lower speed limits and safety measures in protecting children. **Some initiatives include:**

- a. City of New York's Vision Zero: New York City implemented a comprehensive road safety program called Vision Zero to eliminate traffic fatalities and injuries. As part of this program, safe school zones are established with reduced speed limits, improved signage, enhanced cross



## 2. Status Quo on Road Traffic Safety

It is indeed true that road safety situations tend to be better in high-income countries compared to low and middle-income countries. The Global status report on road safety (2018) provides valuable insights into the global road safety scenario.

In high-income countries, there is often greater investment in infrastructure, implementation of stricter vehicle safety standards, and better enforcement of traffic laws. These factors contribute to safer road environments and lower rates of crashes and fatalities. Additionally, high-income countries usually have more resources allocated to public education and awareness campaigns, which help promote responsible behaviour among drivers and pedestrians.

On the other hand, low and middle-income countries often face significant challenges in ensuring road traffic safety due to various factors. These may include inadequate infrastructure, lack of resources for enforcing traffic laws, limited access to quality healthcare services, and lower levels of public awareness and education about road safety.

To improve road safety in low and middle-income countries, it is crucial to focus on several key areas focusing on several key areas is crucial. **These include:**

- 1 Infrastructure Development:** Investing in well-designed and maintained road networks, pedestrian walkways, and safe crossing points can significantly reduce the risk of crashes.
- 2 Vehicle Safety Standards:** Implementing and enforcing vehicle safety regulations can help ensure that vehicles on the roads are equipped with essential safety features and meet minimum safety standards.
- 3 Traffic Law Enforcement:** Strengthening law enforcement capabilities and promoting stricter enforcement of traffic regulations can deter reckless driving behaviors and improve compliance with road safety rules.
- 4 Public Education and Awareness:** Conducting targeted public education campaigns to raise awareness about road safety issues, proper road usage, and the importance of following traffic laws is crucial for changing behaviors and reducing crashes.
- 5 Access to Healthcare:** Ensuring well-equipped medical facilities and emergency services are available to provide timely and effective care to accident victims can significantly improve survival rates and reduce the long-term impact of road traffic crashes.
- 6 International Cooperation:** Collaboration between countries, international organizations, and stakeholders can facilitate the sharing of best practices, resources, and technical expertise to address road safety challenges globally.

By addressing these areas, it is possible to make progress in minimizing the negative impacts of road traffic crashes, reducing economic losses, and improving public health and development in low and middle-income countries.

**Table 1: Countries participated in the *Global status report on road safety 2018***

Region	Number of participated countries	Number of countries in region	% population participated
Africa	44	47	93.7
America	30	35	98.2
Mediterranean (Eastern)	19	22	95.5
Europe	51	53	99.9
Asia (South-East)	10	11	98.7
Pacific (Western)	21	27	99.9
<b>World</b>	<b>175</b>	<b>195</b>	<b>98.1</b>

Source: Adopted from WHO (2018)

Based on the annual report, Norway emerges as the top-performing country regarding road traffic safety worldwide. This conclusion is drawn by considering multiple factors, such as the smaller number of WHO estimated fatality rates per 100,000 population, WHO estimated road traffic fatalities and Reported road traffic fatalities, all for the year 2016. Despite having a higher WHO-estimated fatality rate per 100,000 population, Mauritius is considered safer than Egypt due to its comparatively smaller number of WHO-estimated road traffic fatalities and Reported road traffic fatalities.

In East Africa, Kenya stands out as a leader in ensuring road traffic safety compared to other countries within the region, as indicated by the WHO in 2018. For a comprehensive overview of the global and African status of road traffic safety, please refer to Table 2 and Table 3, respectively.

**Table 2: Ranking of global most road traffic safe countries, based on fatality cases**

Country	WHO estimated fatality rate per 100,000 population (2016)	WHO estimated road traffic fatalities (2016)	Reported road traffic fatalities (2016)	Rank
Norway	2.7	143	135	1
Singapore	2.8	155	141	2
Sweden	2.8	278	270	3
Switzerland	2.8	155	141	4
United Kingdom	3.1	2,019	1,804	5
Netherlands	3.8	648	621	6
Denmark	4.0	227	211	7
Germany	4.1	3,327	3,206	8
Ireland	4.1	194	188	9
Japan	4.1	5,224	4,682	10
Spain	4.1	1,922	1,810	11
Israel	4.2	345	335	12
Finland	4.7	260	252	13
France	5.5	3,585	3,477	14
Australia	5.6	1,351	1,296	15
Italy	5.6	3,333	3,428	16
Canada	5.8	2,118	1,858	17
Belgium	5.8	657	637	18

Source: Created with data from WHO (2018)

**Table 2: Ranking of global most road traffic safe countries, based on fatality cases (cont.)**

Country	WHO estimated fatality rate per 100,000 population (2016)	WHO estimated road traffic fatalities (2016)	Reported road traffic fatalities (2016)	Rank
New Zealand	7.8	364	327	19
Qatar	9.3	239	178	20
Unites States of America	12.4	39,888	35,092	21
Russia	18.0	25,969	20,308	22
China	18.2	256,180	58,022	23

Source: Created with data from WHO (2018)

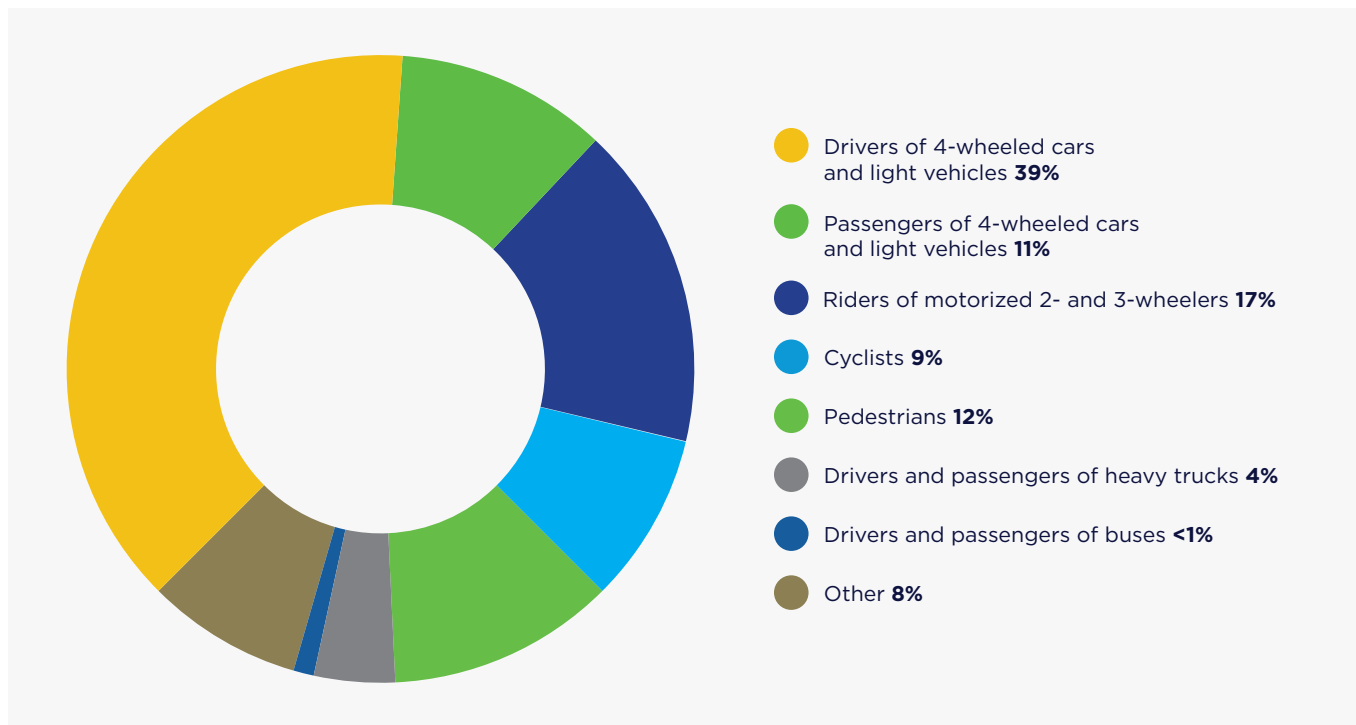
**Table 3: Ranking of African most road traffic safe countries, based on fatality cases**

Country	WHO estimated fatality rate per 100,000 population (2016)	WHO estimated road traffic fatalities (2016)	Reported road traffic fatalities (2016)	Rank
Mauritius	13.7	173	144	1
Egypt	9.7	9,287	8,211	2
Nigeria	21.4	39,802	5,053	3
Ghana	24.9	7,018	1,802	4
South Africa	25.9	14,507	14,071	5
Kenya	27.8	13,463	2,965	6
Uganda	29.0	12,036	3,503	7
Tanzania	29.2	16,252	3,256	8
Rwanda	29.7	3,535	593	9
Malawi	31	5,601	1,122	10
Burundi	34.7	3,651	112	11

Source: Created with data from WHO (2018)

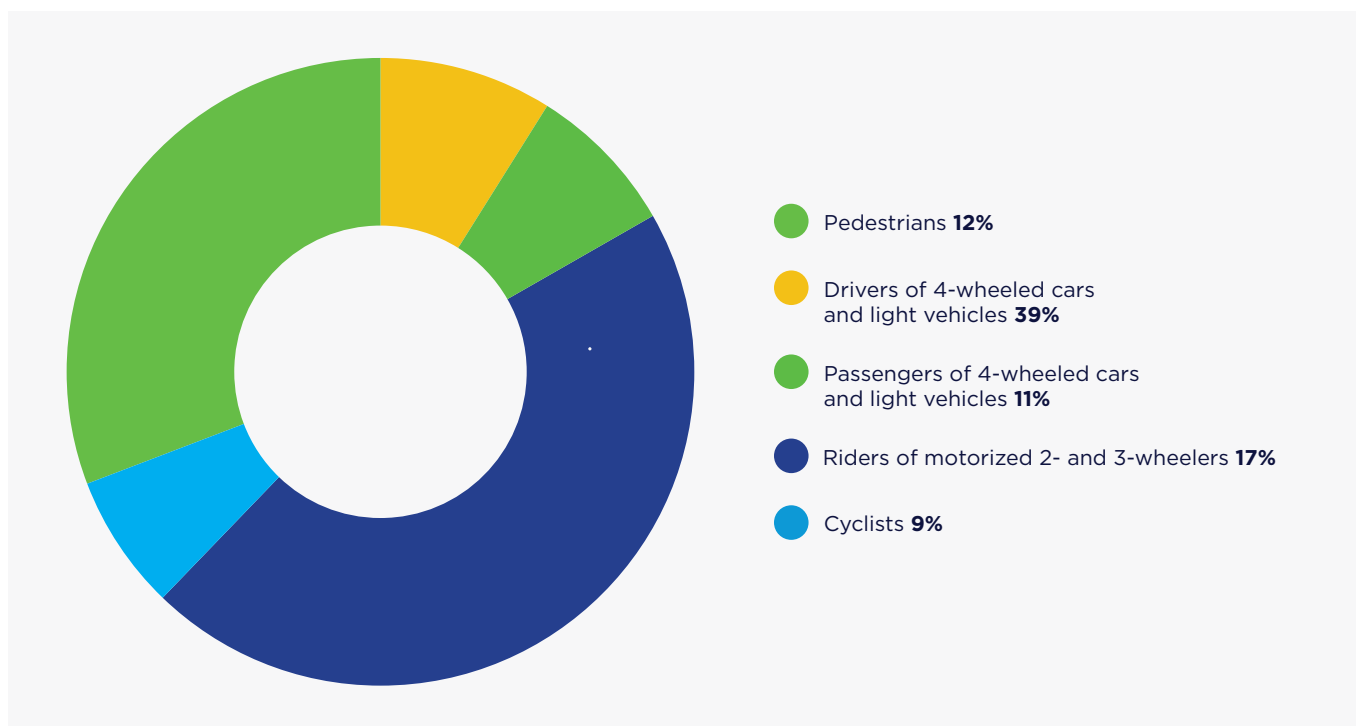
Based on the information provided in Tables 2 and 3, it can be inferred that many countries, particularly those in Africa, have a poor record of reporting road traffic fatalities. This lack of documentation regarding fatalities creates a significant gap in essential information needed to improve road traffic safety in these countries. An analysis comparing the safety of roads globally and in Africa, based on user categories, reveals that in Europe, a high death rate is attributed to drivers of four-wheeled cars and light vehicles (39%). Conversely, in Africa, the majority of deaths involve riders of motorized two and three-wheeled vehicles (46%) as well as pedestrians (31%) (WHO, 2018). For a more detailed breakdown of death cases by road users, please refer to Figures 1 and 2.

**Figure 1: Distribution of death cases by road users in Norway**



Source: Adopted from WHO (2018)

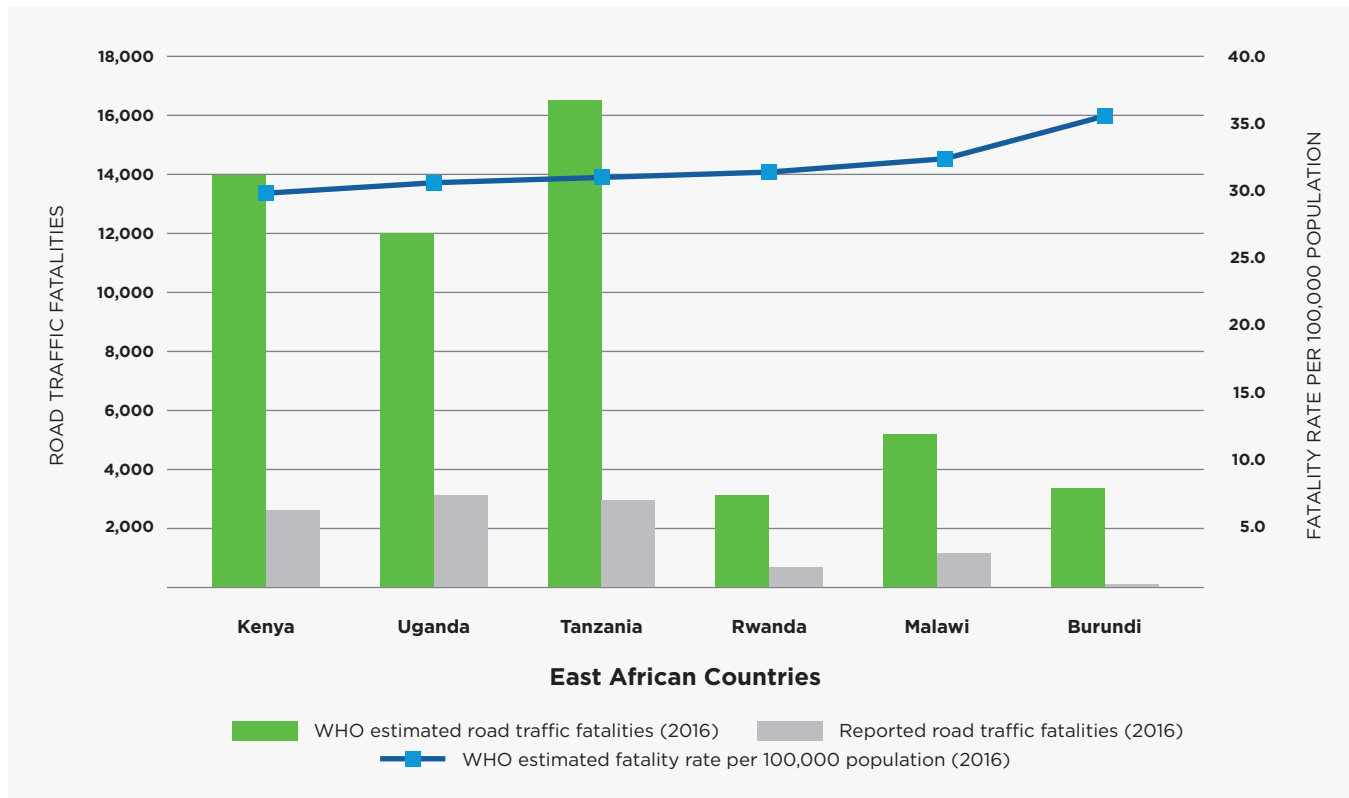
**Figure 2. Distribution of death cases by road users in Mauritius**



Source: Adopted from WHO (2018)

In East Africa, there exists a notable disparity between the estimated road traffic fatalities by the World Health Organization (WHO) and the reported figures. The reported cases are considerably lower than the estimated numbers, indicating a significant underreporting. Additionally, the estimated road traffic fatalities do not correspond to the estimated fatality rate per 100,000 population, as depicted in Figure 3. This discrepancy implies that numerous road incidents go unreported, highlighting the reliance on estimations rather than accurate data for road safety planning.

**Figure 3. East African road safety country profiles summarized**



Source: Created with data from WHO (2018)

Most estimated and reported fatalities are due to drivers' and pedestrians' negligence of road traffic laws and regulations. Speeding beyond 20 mph (30 km/h), in urban settings and school zones, use of cell phones while driving and road crossing without observing the traffic lights and moving vehicles are catalysts for worst road traffic safety (Fisher & Tune, 2010; Grundy et al., 2009; Karndacharuk & McTiernan, 2019; Sharpin & Adriaola-steil, 2019). Adults can control themselves but children below 18 years old need interventions to safeguard them from these fatalities. That's why schools management together with city councils are advised to establish safe school zones in order to force drivers to regulate their speeds and not get distracted while driving (Global Road Safety Facility, 2022; Grabowski et al., 2009; Job et al., 2020; Lambert & Venter, 2015; New Jersey State, 2023).

# 3. Establishment of Safe School Zones

## 3.1 General Overview

Road traffic crashes are a significant cause of death globally, with thousands of families losing children daily. Road traffic crashes are the leading cause of death among children and youth aged 5 to 29 years old, surpassing causes like HIV/AIDS and diarrhea.

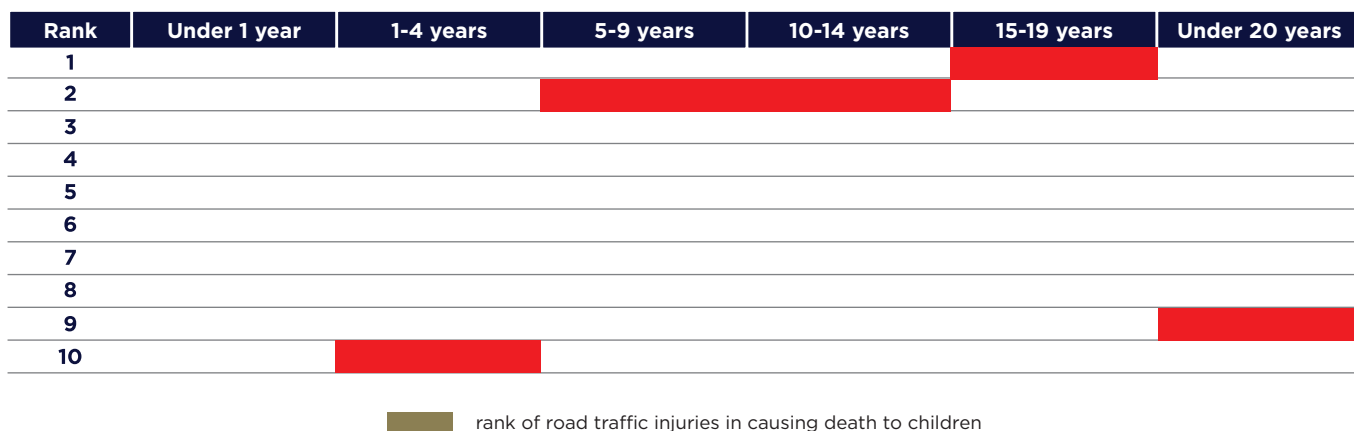
School zones, which encompass the areas around schools where students, parents, and school staff cross, walk, or cycle, play a crucial role in ensuring the safety of individuals in these areas. Establishing school zones involves placing school signs and implementing reduced speed limits, typically 30 km/h in high-income countries and 50 km/h in low and middle-income countries. The relevant authorities responsible for roadways in each country determine the specific speed limits and regulations.

It is important to note that school zones differ from student catchment areas or enrollment boundaries. Catchment areas refer to the geographical areas from which students are eligible to attend a particular school, encompassing various zones such as school sports zones and academic zones. The catchment area is typically larger than the school zone.

Regarding the age groups most affected by road traffic injuries, the report from the World Health Organization (WHO) and UNICEF (2013) states that road traffic injuries are the leading cause of death among children aged 15-19 years old and the second leading cause among children aged 5-14 years old. Adolescents, who fall within the 15-19 age group, tend to be more reckless and less inclined to follow road traffic laws and instructions from instructors and guardians. This age group is often granted driving privileges for motorcycles and cars, and their lack of knowledge and adherence to road traffic signs and principles contribute to their vulnerability on the roads.

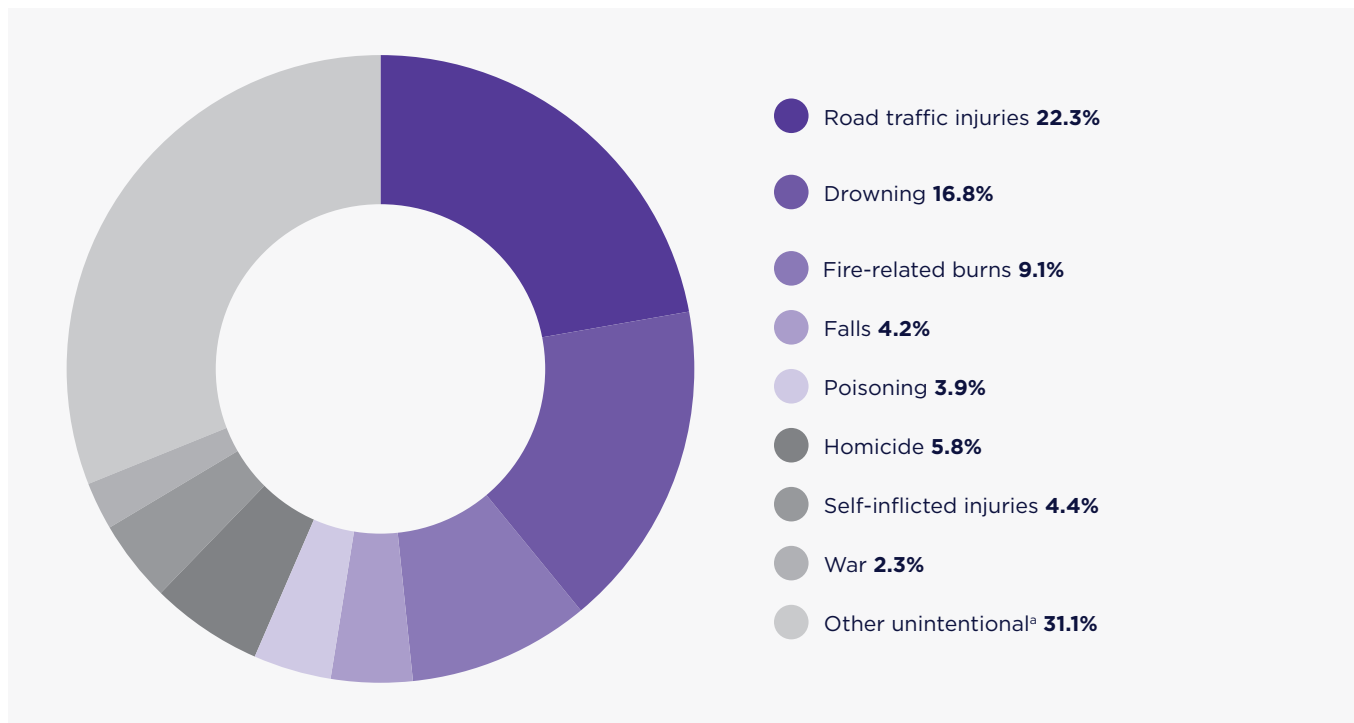
It is essential to raise awareness among adolescents and provide them with proper road safety education to reduce crashes and fatalities. Additionally, implementing effective school zones and speed limits can significantly enhance children and youth's safety around school premises.

**Figure 3. East African road safety country profiles summarized**



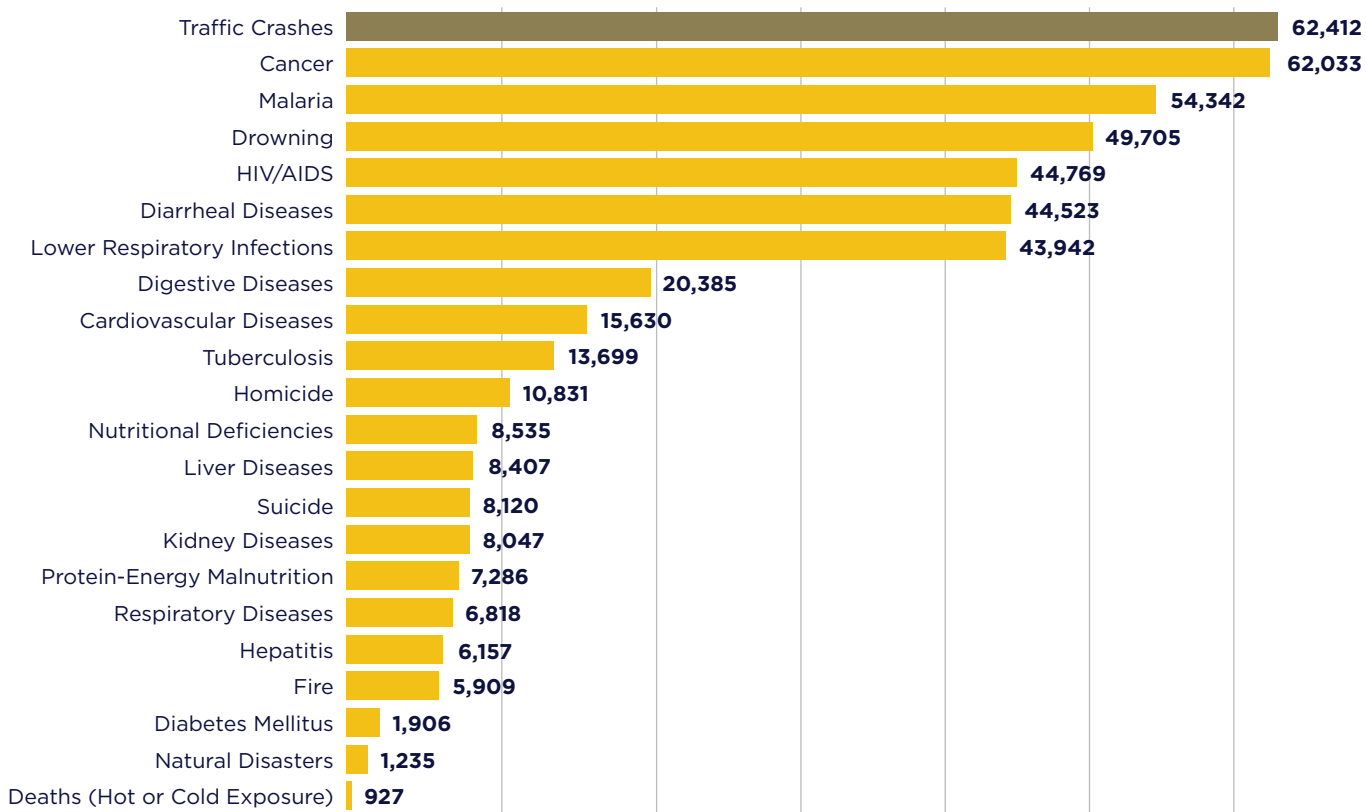
Source: Created with data from WHO (2018)

**Figure 4. Distribution of global child injury deaths by cause, 0–17 years**



Source: Adopted from WHO and UNICEF (2013)

**Figure 4. Distribution of global child injury deaths by cause, 0–17 years**



Source: Adopted from Sharpin & Adriazola-steil (2021)

Table 4 and Figures 4 and 5 highlight the importance of establishing school zones to reduce fatalities. Several studies and sources (Karndacharuk & McTiernan, 2019; Lambert & Venter, 2015; New Jersey State, 2023; Sharpin & Adriazola-steil, 2021) emphasize the urgency of implementing safety measures in school zones to protect children and guardians.

### **3.1.1 Uganda (Preamble on the Status quo in Uganda-statistics) -Traffic & Road safety Report, 2018, 2019 & 2020) and the existing laws on Road Traffic in Uganda**

Uganda, a sub-Saharan low-income country in East Africa, faces significant road traffic safety challenges. With a population of 44 million in 2019 and a Gross Domestic Product (GDP) growth rate of 2.9% in 2020, the country experiences a high number of road traffic crashes. According to statistics from the World Bank, Uganda registers up to 50 road traffic crashes per day, affecting a total of 18,426 individuals. Out of those affected, 17.5% lose their lives, and 74.5% sustain severe injuries requiring inpatient treatment.

The Accident Severity Index (ASI) in 2015 reported an average of 18 deaths per 100 crashes, resulting in a total of 3,224 road deaths. Recent data by Ayume (2022) suggests a higher fatality rate, with 12 deaths per day and a total of 4,380 road crash attributed deaths. The World Health Organization (WHO) estimates an even higher number of fatalities, approximately 10,280 deaths, and a rate of 27.4 fatalities per 100,000 population. These figures place Uganda among the countries with the highest death rates due to unsafe roads.

Road traffic crashes contribute significantly to hospital-based mortality, ranking fourth among all age groups and sixth among individuals aged 5 years and older. Despite the majority of crash victims dying before reaching a health facility, deaths caused by road traffic crashes accounted for 2.4% of hospital-based mortality in 2014 and 2015. It is important to note that while most traffic and crashes occur in urban settings, particularly in the Greater Kampala Metropolitan Area, the majority of fatalities (77.7%) are recorded outside of metropolitan areas. This underscores the need for comprehensive road safety measures beyond urban centers.

Uganda's road network comprises 20,544 km of officially charted national roads, with only 20% being paved. Additionally, there are approximately 115,000 km of mostly unpaved (gravel and dirt) roads at the district and community levels. These roads bear the brunt of 90% of public and goods traffic, leading to considerable strain, especially during the rainy season. The estimated number of vehicles on Uganda's roads ranges from 700,000 to 1,200,000, with a growing trend observed, particularly in motorized two-wheel vehicles.

### **3.1.2 Scaling Up Advocacy For Safe School Zone Uganda- Gulu City Pilot Project**

HOVITA with support from GRSP AND GHAI under the Project SCALING UP ADVOCACY FOR SAFE SCHOOL ZONE Uganda

To carry out a Road Safety assessment/situational analysis for 2 Schools that is Gulu primary school and Mother Angelliotta primary school in Gulu city 2021.

The assessment was aimed at helping HOVITA to make recommendations for improving safety of roads around schools, raising awareness among children, parents, teachers and school community, and advocate for development and implementation of safe school zones to the relevant government Ministries, Departments and Agencies (MDAs) and Gulu City.

The assessment was achieved through data collection, assessment and analysis; key informant interviews; focus group discussion and school zone road safety assessment using the iRAP Star Rating for Schools (SR4S) Methodology.

The tools used by the team during the exercise included questionnaires, SR4S data form, audio recordings, note books, digital cameras and tape measures. The data was assessed and analyzed as per the iRAP Star Rating for Schools (SR4S) guide.

### **The HOVITA team established the following general safety concerns or risks:**

- There are inadequate school zone signage to moderate traffic speeds.
- There are no access road signage and school information signage on most of the roads to alert and guide motorists to make correct and quick decisions.
- There are inadequate designated crossing points (zebra crossings) for the children/pedestrians and speed management in school zones.
- Some schools have no crossing supervisor to help control children crossing movements. All schools have no crossing supervisor signage.
- Most of the roads are not marked and where the markings exist, they are faded.
- There are no junction signs and yield signs on most of the approaches to road junctions.
- There are inadequate speed control or calming measures (i.e., Humps, rumble strips) on all road sections within the school zone areas.
- Where the humps and rumble strips exist, they are not marked hence not easily visible to road users.
- There is insufficient speed limit signage in school zones.
- There are no walkways/sidewalks on most of the roads within the school zones.
- There are open/unprotected side drains on most of the roads, which is very hazardous to children.
- Overgrown roadside shrubs obstruct visibility.
- Uncovered manholes on the pedestrian walkways.
- No Road signs for Blind, deaf and disabled children

### **The review thus makes the following recommendations:**

- Designate school zones and provide adequate school zone signage to help moderate traffic speeds which can reduce injury severity.
- Install adequate access road signage and visible school information signage along all roads at appropriate locations to guide, alert and warn motorists make correct and quick decisions.
- Provide designated raised and properly marked crossings points (zebra crossings) and install appropriate speed regulation signage reinforced with speed control measures in school zones.
- Provide at least two (2) crossing supervisors per school to guide and help control children/pedestrian crossing movements mostly at peak school hours.
- Install adequate speed control measures (rumble strips, humps) in school zones and built-up areas with high pedestrian density and junctions appropriately to enforce speed reduction.
- Cover all manholes on the pedestrian walkways.
- Install appropriate speed limit signage to adequately guide and regulate drivers through the school zones.
- Provide sidewalks for the children along the roadside adjacent to the school.
- Clear the roadside environment of shrubs to enhance visibility
- Enhance awareness raising, sensitisation and routine road safety education for school children, teachers, parents and school community including all road users.
- Conduct trainings for school teachers on how to convey road safety points to children at different ages.
- Enhance advocacy for development and implementation of safe school zones policies and regulations.

This report refers first to the general road safety concerns, and then gives the findings and recommendations for the concerns at specific points along the inspected road sections around school zones.

The assessment established several road safety concerns as presented in the foregoing, the school zone road safety risk is generally rated high (essential) on all road section based on the findings.

Awareness raising, sensitization and routine road safety education for school children, training for school teachers on how to convey road safety points to children at different ages and inclusion of road safety in the education school curriculum are very important if the vision of having a world where children travel safely to and from school is to be realized.

The advocacy for development and implementation of safe school zones policies and regulations should be enhanced. School zones should be gazetted at least 100m on either side from the school main entrance.

Vehicle operating speeds are expected to increase if the roads are rehabilitated hence designs should be audited for safety before implementation. School zones should be gazetted at least 50m on either side from the school main entrance and on all approaches and junctions within a radius of 50m from the school.

There is need to continuously monitor and evaluate the outcomes of improved areas. However, there is no systematic process for registering number of pupils/students suffering from road crashes when travelling to/from school apart from a few that may be reported to Police which makes the evaluation difficult.

### 3.1.3 Justification for establishing safe school zones in Uganda

One concerning aspect of road traffic crashes in Uganda is the impact on school-going children. With an estimated 10 million school-going children, road traffic crashes are the leading cause of death for this age group. In 2018, 1,200 school-going children lost their lives in road traffic crashes, increasing to 1,300 in 2019 and slightly decreasing to 1,100 in 2020. This highlights the urgent need to address road safety in areas surrounding schools.

**Table 5**

Year	Number of fatalities	Percentage of all fatalities
2018	200	10%
2019	220	12%
2020	180	10%

**School-going children accounted for 10% of all road traffic fatalities in 2020.** This means that out of every 100 people who died in a road traffic crash in Uganda in 2020, 10 were school-going children.

**The most common cause of road traffic fatalities for school-going children is being hit by a car.** In 2020, 60% of all road traffic fatalities involving school-going children were caused by being hit by a car.

**The most common time for road traffic fatalities involving school-going children is during the morning and evening rush hour.** In 2020, 50% of all road traffic fatalities involving school-going children occurred during the morning and evening rush hour.

These statistics highlight the need for urgent action to improve road safety for school-going children in Uganda. There are a number of things that can be done to improve road safety for school-going children.

Safe school zones, characterized by reduced speed limits and traffic calming measures, play a crucial role in protecting children who walk or bike to school. These zones help reduce the number of road traffic crashes involving children and ultimately save lives. Establishing safe school zones in Uganda is justified by the need to protect children, reduce injuries, save lives, and safeguard the economy.

## 3.2 lessons learned from successfully established Safe school zones

These zones adhere to minimum road traffic provisions, including speed management, visible traffic signs indicating the school zone entrance and exit, zebra crossings, and pedestrian walkways (Tak & Hirasdas, 2022). While high-income countries have made significant progress in establishing school zones across various education levels, middle and low-income countries lag behind in implementing such measures (Global Road Safety Facility, 2022; Lambert & Venter, 2015; UN, 2021).

### ▶ 3.2.1 “Heart Zone” concept implemented in Norway and Singapore

Norway introduced this concept to protect pupils from road crashes by designating a car-free zone around schools. Vehicles are not allowed to pick up or drop off students within the school zone, ensuring their safety and reducing chaos. The concept was first tested in Oslo at Ruseløkka elementary school, located on a busy road. Despite having an established school zone, approximately 15,000 passing cars daily posed a high risk to children (Tinga, 2018). Singapore has also adopted a similar concept at Nexus International School and North London Collegiate School, where only school buses are allowed to pick up and drop off students, with drivers adhering to low-speed limits to ensure safety (HoneyKids, 2023).

### ▶ 3.2.2, safe routes and speed camera interventions

Drawing from the experience in the United States. The township of Montclair developed a district-wide safe routes to school program, aligning with New Jersey’s speed limits of 25 mph (30 km/h) for roads passing school zones. Safe routes include marked boards alerting drivers to the presence of children and mandatory signs like school crossing and speed signs. The program discourages distracted driving and drinking while driving in school zones (Grabowski et al., 2009; New Jersey State, 2023). Additionally, installing speed cameras at school zones and other speed-controlled areas reduce RTCs significantly. Fixed cameras and red-light speed cameras are proposed, with over-speeding drivers facing heavy fines and potential license suspension (Job et al., 2020).

### ▶ 3.2.3 Indonesia

The study in Indonesia was conducted by the World Health Organization (WHO) and the Indonesian Ministry of Health. The study involved surveying 1,000 children and 500 parents in two cities in Indonesia. The study found that most children (80%) walked to school, and the most common hazards they faced were speeding cars and a lack of sidewalks. The study also found that parents were concerned about the safety of their children walking to school.

The study found that youth participation in school safety zone assessments effectively identified and addressed these hazards. The youth surveys and observations provided valuable information about the specific hazards that children faced, and the data was used to advocate with government officials for changes to make school zones safer.

As a result of the study, the government of Indonesia implemented several safety measures in school zones, including:

- Reducing speed limits
- Installing traffic calming measures
- Enforcing speed limits
- Educating drivers and pedestrians about the dangers of speeding and distracted driving in school zones

The study found that these measures were effective in reducing the number of crashes in school zones.

### 3.2.4 Canada: The Parachute Vision Zero program

This national initiative aims to eliminate traffic fatalities and serious injuries in Canada. The program has launched a series of case studies on safe school zones. The case studies highlight a variety of strategies that have been used to improve safety around schools, including:

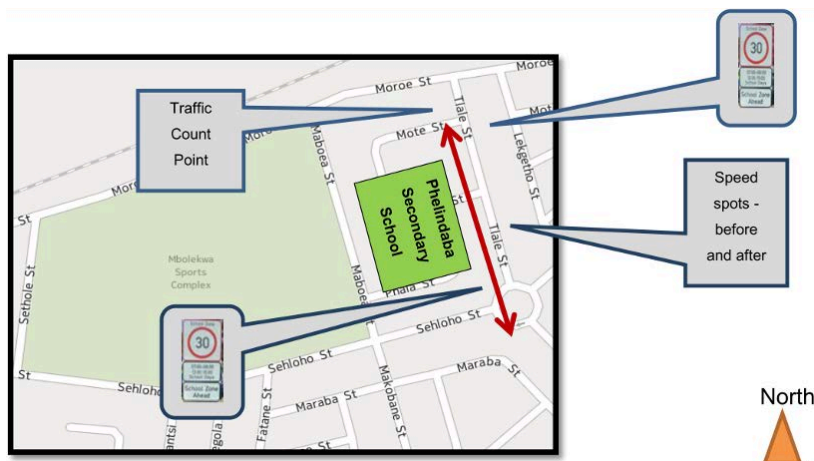
- Engineering changes, such as reducing speed limits, installing traffic calming measures, and creating wider sidewalks
- Education and enforcement programs, such as driver education courses, public awareness campaigns, and increased police enforcement
- Community engagement initiatives, such as school crossing guards, neighbourhood watch programs, and parent-teacher associations

The case studies found that these strategies can effectively reduce the number of crashes in school zones.

### 3.2.5 Speed reduction measures based on the experience in South Africa

Assessments conducted at Phelindaba Secondary School, Crawford College, and A Re Thabeng Primary School showed that reducing the speed limit from 50 km/h to 30 km/h significantly reduced road traffic fatalities. Speed signs were installed on both sides of the road crossing the school zones, enhancing visibility for drivers approaching from all directions (Lambert & Venter, 2015).

**Figure 6. Installed two-speed limit boards on each side of entry of the school zone at Maboea Street**



Source: Adopted from Lambert & Venter (2015)

Despite zebra crossing signs in school zones, areas without speed limit zones experienced higher rates of road traffic injuries. However, installing speed limit boards has proven to increase driver attention and awareness, thereby reducing traffic injuries among students and teachers (Grabowski et al., 2009; Lambert & Venter, 2015; WHO, 2009). Figure 7 illustrates the difference in visibility before and after installing speed limits. At Phelindaba Secondary School zone, implementing school zone signs and speed limit boards has effectively decreased the risk of injury for students and guardians.

**Figure 7. School zone at Phelindaba Secondary school, A. Before installation speed limit board, B. After the installation of the speed limit board**



Source: Adopted from Lambert & Venter (2015)

Limiting the speed of vehicles to 30 km/h clearly shows a significant impact in reducing road traffic fatalities at school zones. Moreover, installing the speed limit boards to school zones has been proven to catch the attention of motorists who took note of the information displayed on the high-visibility road signs (Lambert & Venter, 2015).

### ▶ 3.2.6 Safe schools' projects in Africa, Learning from Tanzanian experience

Several projects aiming to enhance the safety and well-being of school children by preventing and reducing road traffic crashes have been documented globally, including in Africa and Tanzania. This section focuses on projects funded by Amend in Tanzania. The first ongoing project, initiated in 2019, has a funding budget of 581,000 Swiss francs (CHF), equivalent to over 640,000 USD. Its primary objective is to ensure safe and healthy journeys to school for children and adolescents in Tanga, Tanzania. Foundation Botner funds the project and aligns with the milestones set by the grantee, Amend.

According to Amend, prior to the implementation of this project, at least one child in 40% of all primary schools in Tanga, Tanzania, had experienced a road traffic injury in the previous year. Therefore, the main deliverable of this project is to significantly reduce road traffic injuries among school children in all schools in Tanga. To achieve this, the project focuses on the following milestones:

1. Developing a safe and sustainable transport action plan for Tanga, with active involvement and commitment from local stakeholders.
2. Enhancing pedestrian infrastructure around eight selected schools.

3. Providing tailored road safety education to over 12,000 children and adolescents.
4. Establishing school road safety clubs and 'Kids' Courts'.
5. Conducting safety training for over 300 motorcycle taxi riders.
6. Implementing monitoring and evaluation activities, including a major study on road traffic injuries among children and adolescents.

All stakeholders involved in road safety, particularly those within the selected school zones, are being trained to implement practical road safety measures even after the project concludes (Amend, 2023a). Figure 8 illustrates school zone stakeholders walking on a clearly marked zebra crossing.

**Figure 8. Safe school zone stakeholders walking on visible allocated road crossing in Tanga**



Source: Adopted from Amend (2023a)

Incorporating school zones into safe road designs is crucial, requiring frequent audits to improve road standards. In 2020, the World Bank provided a funding amount of USD 49,985 to Amend for their project on Road Safety Design Audit for Improved Road Safety Standards, part of the Dar es Salaam Metropolitan Development Project (DMDP). This one-year partnership project between Amend, the Tanzanian government, and the World Bank aimed to address mobility challenges in Dar es Salaam through construction and other

measures. The project's main objective was to enhance the safety of non-motorized road users, particularly pedestrians, by identifying public safety risks in detailed road designs. Specifically, schoolchildren were identified as the most vulnerable road users who should have been considered during the design and construction of road projects. To ensure the inclusion and proper implementation of safety measures in school zones, projects like Amend's require additional funding to provide technical assistance and consultancy services (Amend, 2021).

Apart from technical projects, it is essential to focus on the mindset shift of key stakeholders regarding safe school zones. Schoolchildren are an ideal group for education since they quickly absorb and share knowledge. Amend developed a "Secondary School Road Safety Education: The VIA Program" program targeting secondary school students. This program, funded with USD 230,000 by the Total Energies Foundation, aimed to train students from one school in Dar es Salaam and one in Tanga, Tanzania. The program was delivered after school for a month through 40-minute sessions held in road safety clubs established by Amend at each school (see Figure 9). Upon completing the training program, the graduates became road safety "ambassadors" for their schools and communities. Effective dissemination of shared knowledge was ensured through press coverage, utilizing mass media such as television, radio, and newspapers (Amend, 2023b).

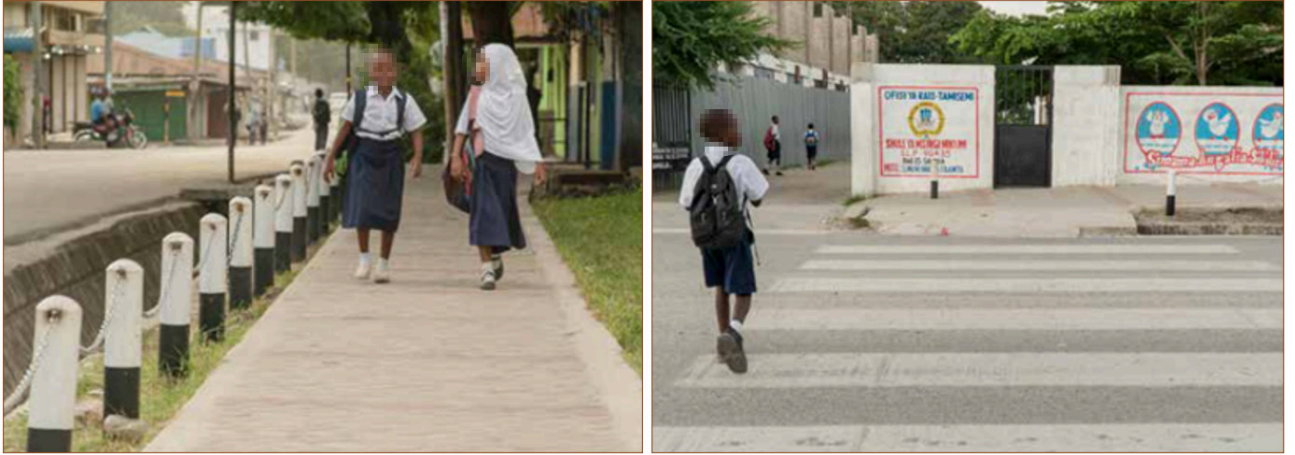
**Figure 9. Training of secondary school students on road safety**



Source: Adopted from Amend (2023b)

It is important to note that Amend and the traffic police force alone are insufficient to establish safe school zones in Tanzania. This is primarily because the country, like many others in Africa, lacks a law that mandates a speed limit of 30 km/h in the vicinity of schools. Consequently, until stakeholders recognize the necessity for such a law, it is advisable to incorporate additional measures, such as sidewalks and zebra crossings (see Figure 10) in road designs and construction (Sharpin & Adiazola-stiel, 2019).

**Figure 10. Sidewalks and visible zebra crossing at school zones**



Source: Adopted from Sharpin & Adriazola-steil (2019)

A need for multi-stakeholders engagement is seen in successfully establishing safe school zones (Sharpin & Adriazola-steil, 2019).

## 4. Driving forces towards the successful establishment of school zones

The successful establishment of school zones in countries, regardless of their income level, primarily relies on the presence of road traffic laws that mandate the creation of such zones around schools. However, these laws, policies, regulations, and guidelines differ from country to country, although they share some common elements such as providing road crossings for students near the school vicinity and implementing speed limit signs. While some countries have designated a maximum speed limit of 30 km/h in school zones, many low-income countries still adhere to the 50 km/h limit (International Transport Forum, 2018; New Jersey State, 2023; WHO, 2009, 2017a).

The second driving force behind the successful implementation of school zones is the increasing number of road traffic fatalities involving school children, particularly in low-income countries (Grabowski et al., 2009; SRTS, 2023; Welle et al., 2018). Bari et al. (2021), Global Road Safety Facility (2022), and WHO (2009, 2018) have all reported that the establishment of school zones has a significant impact on reducing the risk of road traffic injuries to school children. This is because drivers' behaviour is primarily influenced by road signs rather than their sympathy for the presence of school children.

Excessive speeding around school zones is a leading factor in the rise of road traffic injuries among school children. There is a strong correlation between speed and the number of crashes not only in school zones but also on all roads. Increased speed is associated with a higher number of crashes and injuries to school children, while decreased speed is linked to a decrease such incidents (International Transport Forum, 2018). To address this issue, establishing road crossings (such as zebra crossings) and visible school zone sign boards has become paramount, as they automatically create a school zone.

According to Tak and Hirasdas (2022), for a school to be recognized as having established a safe school zone, **it must consider six key aspects in designing these zones:**

- 1 Delineation of the school zone:** This involves marking out a stretch of at least 200 meters that provides safe access for students walking to school. Typically, this area extends from outside the school's entrance to the nearest public transport stop.
- 2 Road markings and signage:** Clear road markings and signs, labelled "School Zone" or "School Zone Ahead" ensure a smooth and orderly flow of traffic. Signage for school children's road crossings, "Slow Down," and "Stop" should be visible to motorized users.
- 3 Vibrant pedestrian crossings:** Highly visible zebra crossings with colourful patterns on the road create awareness for both motorists and pedestrians. These crossings can potentially improve drivers' yielding behavior, encouraging them to reduce speed and stop before passing the zebra crossing.
- 4 Bulb-Outs:** Bulb-outs are extensions to footpaths that reduce the crossing distance and minimize pedestrians' exposure to moving vehicles. They are typically provided at locations where children wait before crossing the street and can help reduce speeds by at least 2 km/h.

- 5 Speed calming measures:** These measures are essential at locations where school children are likely to encounter moving vehicles, especially at intersections without signals or crossings. Colorful pavement markings, guide strips on footpaths, and simple road markings can enhance children's experience of walking along the footpath. Clear markings that direct children to the school entrance and public spaces in the school zone should be implemented. Guide strips can delineate a safe walking zone on the footpath and include colorful signage that reads "Wait."
- 6 Informative footpaths:** Streets designed to accommodate school children should include colorful pavement markings, guide strips on footpaths, and simple road markings. These elements enhance



## 5. Challenges facing the successful establishment of school zones

Limited funds allocated by government institutions and donor funders significantly hinder designing, implementing, and monitoring school zone programs. Insufficient budgets limit the enforcement of laws and the implementation of government policies and plans related to road traffic safety, including establishing school zones. These plans are crucial in achieving international goals, such as halving the number of traffic injuries by 2030.

Persistent habit of motorists ignoring school zones despite their existence. Drivers often engage in distracted behaviours such as using their phones, drinking while driving, or eating, which compromises the safety of school zones. The affordability of fines set for traffic violations contributes to this problem, as drivers can easily pay the fines without significant financial consequences. Additionally, corruption among traffic officers further exacerbates the ignorance of school zones, particularly in low-income countries.

Another challenge is the reluctance of some low-income countries, like Tanzania, Kenya, and Uganda, to adopt a reduced speed limit of 30 km/h in designated school zones. While there is a global debate on lowering speed limits to enhance safety in school zones, some low-income countries have hesitated to adopt even the existing standard of 30 km/h. This reluctance presents a significant obstacle to establishing safe school zones in these regions.

Addressing these challenges requires a multi-faceted approach. Adequate funding should be allocated to road traffic safety programs, including establishing and maintaining school zones. Governments and donor funders must prioritize these initiatives and ensure sufficient resources are available. Additionally, raising awareness among motorists about respecting school zones and enforcing stricter penalties for violations can help deter dangerous behaviors. Moreover, addressing corruption within the traffic enforcement system is crucial to ensure compliance with school zone regulations. Finally, further advocacy and collaboration are necessary to encourage low-income countries to adopt and implement lower speed limits in school zones to enhance the safety of children.

# 6. Conclusion and Recommendations

## 6.1 Conclusion

High- and middle-income countries tend to have better road traffic safety records than low-income countries, including successfully establishing safe school zones that protect school children from road injuries. However, low-income countries face several challenges in ensuring road traffic safety, particularly for school children. One of the main obstacles is limited funds available from government institutions and donor funders to design, implement, and monitor school zone programs.

Successful establishment of safe school zones requires financial resources to undertake various crucial steps. Firstly, a comprehensive assessment of the road infrastructure surrounding schools is needed to identify potential risks and areas for improvement. This assessment includes evaluating road design, traffic flow patterns, pedestrian infrastructure, and existing safety measures. However, conducting these assessments and subsequent analyses requires financial investment.

Once the assessments are complete, appropriate measures must be designed and implemented to enhance safety in school zones. These measures may include physical infrastructure improvements like speed bumps, zebra crossings, traffic signs, and signals. School-specific interventions like designated drop-off and pick-up areas, school safety patrols, and awareness campaigns targeting parents and students are also necessary. However, implementing these measures requires construction, installation, and ongoing maintenance funding.

Monitoring and evaluating the effectiveness of school zone programs is another crucial aspect. Regular monitoring allows for identifying potential issues, gaps in implementation, or the need for adjustments. It helps assess the impact of interventions and gather data for further improvements. However, monitoring and evaluation activities also demand financial resources, including personnel, equipment, data collection, and analysis.

The need to successfully establish safe school zones in low-income countries is further intensified by road traffic injuries being the leading cause of death among children between 0-17 years old. Schoolchildren are exposed to the risks of crashes, injuries, and fatalities when commuting to and from school without adequate safety measures.

Although many countries have adopted a speed limit of 30 km/h in school zones, the issue of speeding persists. Despite regulations, some drivers continue to exceed speed limits, endangering the safety of school children. Addressing this challenge requires a multi-faceted approach. Effective enforcement of speed limits through increased police presence, speed cameras, and strict penalties can act as deterrents. Public awareness campaigns can educate drivers about the importance of adhering to speed limits in school zones. Engaging with the community, including parents, teachers, and students, can foster a culture of responsible driving and instill respect for school zone regulations.

It is crucial to allocate adequate funds and resources to improve road traffic safety in low-income countries and successfully establish safe school zones. Governments, international organizations, and stakeholders should collaborate to develop sustainable financing mechanisms targeted explicitly at

road safety initiatives, including school zones. These mechanisms may include redirecting existing funds, exploring public-private partnerships, seeking support from international development agencies, and engaging with local communities to contribute resources.

Moreover, a comprehensive approach to road safety should be adopted, encompassing infrastructure improvements, driver education and training, enforcement measures, and public awareness campaigns. Investing in road infrastructure upgrades, such as pedestrian-friendly sidewalks, well-marked crossings, and traffic calming measures, can create safer environments for school children. Driver education programs can promote responsible behaviors and reinforce the importance of following speed limits near schools. Collaboration between law enforcement agencies and schools can help enforce regulations effectively.

In summary, addressing the challenges in establishing safe school zones in low-income countries requires sufficient funding and resources. It necessitates a multi-sectoral and comprehensive approach that involves governments, international organizations, donors, communities, and other stakeholders working together to prioritize road safety initiatives, implement targeted interventions, enforce regulations, raise awareness, and continuously monitor and evaluate the effectiveness of school zone programs.

## 6.2 Recommendations

- 1. Enhanced law enforcement:** Law enforcement agencies should actively enforce traffic laws in school zones to address speeding and non-compliance with school zone regulations. This can involve conducting regular patrols, installing speed cameras, and increasing violation fines. Additionally, implementing stricter penalties, such as license suspension or revocation, can deter irresponsible driving behavior.
- 2. Public awareness campaigns:** Launching targeted public awareness campaigns can help educate drivers, parents, and the general public about the importance of school zones and the need to prioritize road safety for school children. These campaigns can include media advertisements, community events, and educational programs in schools to raise awareness about the risks associated with speeding and distractions while driving.
- 3. Capacity-building and training:** Providing training programs for traffic officers and relevant stakeholders on the importance of school zones and effective road safety measures can significantly contribute to their successful establishment. This can involve workshops, seminars, and specialized training sessions to enhance their knowledge and skills in enforcing traffic laws, implementing infrastructure improvements, and promoting safe behaviours around school zones.
- 4. Collaboration with stakeholders:** Establishing partnerships and collaborations with various stakeholders is crucial for successfully establishing safe school zones. This can involve working closely with schools, parent-teacher associations, local community organizations, and transport authorities to address road safety concerns collectively. Engaging parents and school administrators in road safety initiatives can help foster a sense of responsibility and encourage active participation in promoting safe transportation practices.
- 5. Infrastructure improvements:** Adequate infrastructure is essential for the effective functioning of school zones. Governments and relevant authorities should invest in constructing and maintaining well-designed and visible road markings, signs, and traffic calming measures, such as speed humps and raised pedestrian crossings. These infrastructure elements should be regularly inspected and maintained to ensure their effectiveness and visibility.

- 6. Research and data collection:** Continuously monitoring and evaluating the effectiveness of school zones is crucial for identifying areas of improvement and implementing evidence-based interventions. Governments and relevant organizations should invest in research studies and data collection to analyze the impact of school zones on road safety, identify challenges, and develop targeted strategies for improvement.
- 7. International cooperation and knowledge sharing:** Low-income countries can benefit from international cooperation and knowledge sharing on road traffic safety best practices. Engaging in partnerships with organizations specialising in road safety, such as the World Health Organization (WHO) and international transport forums, can provide valuable insights, resources, and technical support to aid in establishing safe school zones.

By implementing these recommendations, Uganda can work towards successfully establishing safe school zones, reducing road traffic injuries among school children, and creating a safer environment for all road users. It requires a multi-faceted approach encompassing policy changes, infrastructure improvements, public awareness, and effective enforcement to achieve meaningful and lasting results.



# References

- Amend. (2021). *Road safety design audit for improved road safety standards, Dar es Salaam Metropolitan Development Project (DMDP)*. Amend, Our Work. <https://www.amend.org/our-work/#>
- Amend. (2023a). *Safe and Healthy Journeys to School for Children and Adolescents in Tanga, Tanzania*. Amend, Our Work. <https://www.amend.org/our-work/#>
- Amend. (2023b). *Secondary School Road Safety Education: The VIA Program*. Amend, Our Work. <https://www.amend.org/our-work/#>
- Bari, I., Rosen, H., Paichadze, N., Peden, M., Monclus Gonzalez, J., & Hyder, A. (2021). *0073 Global road safety: analysis of global status reports on road safety. November, A20.1-A20*. <https://doi.org/10.1136/injuryprev-2021-savir.50>
- Bornioli, A., Bray, I., Pilkington, P., & Parkin, J. (2020). Effects of city-wide 20 mph (30km/hour) speed limits on road injuries in Bristol, UK. *Injury Prevention, 26*(1), 85-88. <https://doi.org/10.1136/injuryprev-2019-043305>
- Brayer, E. (n.d.). *George Eastman : a biography*. 637.
- Fisher, J., & Tune, M. (2010). 20mph speed limit pilots: Evaluation report. *Warrington Borough Council*.
- Fridman, L., Ling, R., Rothman, L., Cloutier, M. S., Macarthur, C., Hagel, B., & Howard, A. (2020). Effect of reducing the posted speed limit to 30 km per hour on pedestrian motor vehicle collisions in Toronto, Canada - A quasi experimental, pre-post study. *BMC Public Health, 20*(1), 1-8. <https://doi.org/10.1186/s12889-019-8139-5>
- Global Road Safety Facility. (2022). *Global Road Safety Annualy Report 2022*. Washington DC: *Global Road Safety Facility*, World Bank.
- Grabowski, J. G., Goodman, S., & Worldwide, S. K. (2009). Distracted Drivers in School Zones: A National Report. *Safe Kids, USA*, 15p. <https://www.safekids.org/research-report/distracted-drivers-school-zones-national-report-2009%0Ahttps://trid.trb.org/view/902049>
- Grundy, C., Steinbach, R., Edwards, P., Green, J., Armstrong, B., & Wilkinson, P. (2009). Effect of 20 mph traffic speed zones on road injuries in London, 1986-2006: Controlled interrupted time series analysis. *BMJ (Online), 339*(7736), 31. <https://doi.org/10.1136/bmj.b4469>
- Hamric, K. R., Pumphrey, M., & Virginia, W. (2013). *An Evaluation of School Zone Traffic Control Strategies*. 814-865.
- HoneyKids. (2023). *All the best international schools in Singapore | HoneyKids Asia*. <https://honeykidsasia.com/best-international-schools-in-singapore/>
- International Transport Forum. (2018). Speed and crash risk. Research Report. *OECD Publishing, Paris. International Traffic Safety Data and Analysis Group*, 82. <https://www.itf-oecd.org/speed-crash-risk%0Ahttps://trid.trb.org/view/1508779>
- Job, S., Cliff, D., Fleiter, J., Flieger, M., & Harman, B. (2020). Guide for Determining Readiness for Speed Cameras and other Automated Enforcement. *Global Road Safety Facility and the Global Road Safety Partnership, Geneva, Switzerland*.

- Job, S., & Mbugua, L. W. (2017). Road Crash Trauma, Climate Change, Pollution and the Total Cost of Speed. Six Grpahs that tell the story. *Global Road Safety Facility, World Bank, GRSF Note(1)*, 1-25.
- Karndacharuk, A., & McTiernan, D. (2019). Implementation Principles for 30 km/h Speed Limits and Zones. *Journal of the Australasian College of Road Safety, 30(2)*, 45-54. <https://doi.org/10.33492/jacrs-d-18-00065>
- Lambert, F., & Venter, C. (2015). *TESTING THE IMPACT AND FEASIBILITY OF 30 km / h SPEED LIMIT ZONES AT SCHOOLS. Satc*, 65-75.
- Manitoba. (2013). *Manitoba Infrastructure Guide for Establishing Reduced-Speed School Zones Overview Designating Reduced-Speed School Zones Maximum Speed in a Reduced-Speed School Zone By-law Requirements*. 1-15.
- Mitullah, W., Small, M., & Azzouzi, M. (2022). A Study of Road Safety Lead Agencies in Africa. *A Study of Road Safety Lead Agencies in Africa*. <https://doi.org/10.1596/37242>
- Neki, K., Lumumba, M., Mitra, S., & Job, S. (2021). Economic impact of 30km/h - Benefits and Costs of Speeds in an urban environment. *Journal of Road Safety, 32(3)*, 49-51. <https://doi.org/10.33492/jrs-d-21-00028>
- New Jersey State. (2023). NJ School Zone Design Guide. *New Jersey Statutes Annotated*. <https://www.state.nj.us/transportation/community/srts/pdf/szdgchapter2.pdf>
- Parmet, S., Lynm, C., & Glass, R. M. (2002). Pedestrian safety. A road safety manual for decision makers and practitioners. In *World Health Organization* (Vol. 288, Issue 17). <https://doi.org/10.1001/jama.288.17.2212>
- Sharpin, A. B., & Adriazola-steil, C. (2019). LOW-SPEED ZONE GUIDE: Empowering communities and decision- makers to plan, design and impliment effective low-speed zones. *World Resource Institute*. <https://doi.org/doi.org/10.46830/wrighb.18.00063>
- SRTS. (2023). *SRTS Guide: Around the School. Safe Routes*. [http://guide.saferoutesinfo.org/engineering/the\\_school\\_zone.cfm](http://guide.saferoutesinfo.org/engineering/the_school_zone.cfm)
- Tak, R., & Hirandas, L. (2022). *Ideas4Action: Six ways to design safer school zones - Cities4Children*. Cities 4 Children, Global Alliance. <https://cities4children.org/blog/ideas4action-six-ways-to-design-safer-school-zones/>
- Tinga, R. (2018). *Oslo experiments with car free 'heart zones' around schools | Eltis*. <https://www.eltis.org/discover/news/oslo-experiments-car-free-heart-zones-around-schools>
- Turner, B., Job, S., & Mitra, S. (2020). Guide for Road Safety Interventions: Evidence of what works and what does not work. *Global Road Safety Facility - World Bank*. <https://doi.org/10.1596/35176>
- UN. (2019). Strategies to tackle the issue of speed for road safety in the Asia-Pasific Region:Implimentation Framework. *United Nations Publications*.
- UN. (2021). Statistics of Road Traffic Accidents in Europe and North America 2021. In *United Nations publications: Vol. LVI*. <https://doi.org/10.18356/9789210001281>
- UN, & WHO. (2021). Decade of action for road safety 2021-2030. In *Unted Nations and World Health Organization*. <https://www.who.int/teams/social-determinants-of-health/safety-and-mobility/decade-of-action-for-road-safety-2021-2030>
- Welle, B., Bray Sharpin, A., Adriazola-Steil, C., Soames, J., Shotten, M., Bose, D., Bhatt, A., Alveano, S., Obelheiro, M., & Imamoglu, T. (2018). Sustainable & Safe: A Vision and Guidance for Zero Road Deaths. *World Resource Institute, 76*. <https://doi.org/ISBN 978-1-56973-927-7>

WHO. (2009). Global Status Report on Road Safety. Time for Action. In World Health Organization Library Cataloguing-in-Publication Data: Vol. ISBN 978 9. WHO publications. [www.who.int/violence\\_injury\\_prevention/road\\_safety\\_status/2009](http://www.who.int/violence_injury_prevention/road_safety_status/2009)

WHO. (2017a). A Road Safety Technical Package. Save Lives. In Geneva, Switzerland; World Health Organization. <http://iris.paho.org/xmlui/bitstream/handle/123456789/34980/9789275320013-por.pdf?sequence=1&isAllowed=y>

WHO. (2017b). Managing Speed. *World Health Organization 2017 Some*, 66(4). <https://creativecommons.org/licenses/by-nc-sa/3.0/igo>

WHO. (2018). Global Status Report on Road Safety. In Geneva: World Health Organization. <http://link.springer.com/10.1007/978-3-319-76887-8><http://link.springer.com/10.1007/978-3-319-93594-2><http://dx.doi.org/10.1016/B978-0-12-409517-5.00007-3><http://dx.doi.org/10.1016/j.jff.2015.06.018><http://dx.doi.org/10.1038/s41559-019-0877-3>

WHO and UNICEF. (2013). World report on Child injury prevention. *World Health Organization*, 45(5), 1503-1507.



