



RIGHTS OF WAY

CHILD POVERTY
& ROAD TRAFFIC
INJURY IN THE SDGS



FOUNDATION



Cover photo: Eunice Kerubo was hit by a speeding 'Matatu' minibus while crossing the road to school. She suffered multiple injuries to her head, chest and leg. She was taken to hospital but her parents could not afford treatment. Aged 10, Eunice missed school following the crash, but she hopes to resume her education (see p20).

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CONTENTS

EXECUTIVE SUMMARY	1
INTRODUCTION ON THE FRONTLINE: THE POOREST AND MOST VULNERABLE	3
ROAD TRAFFIC INJURY, POVERTY & HEALTH	5
EACH DAY, EXPOSED TO DANGER	13
AGENDA FOR ACTION	31
CONCLUSION: A SAFE JOURNEY FOR EVERY CHILD	41
BIBLIOGRAPHY	45
REFERENCES	47
ABBREVIATIONS	49
ABOUT	50



EXECUTIVE SUMMARY P1



EACH DAY, EXPOSED TO DANGER P13



CONCLUSION: A SAFE JOURNEY FOR EVERY CHILD P41



ON THE FRONTLINE: THE POOREST AND MOST VULNERABLE P3



ROAD TRAFFIC INJURY, POVERTY & HEALTH P5



AGENDA FOR ACTION P31



BIBLIOGRAPHY / REFERENCES / ABBREVIATIONS P45-49



ABOUT P50

EXECUTIVE SUMMARY



With the launch of the Sustainable Development Goals (SDGs), a new era of global development has begun and ambition is high. The eradication of poverty in all its forms is a central objective – a task which will require immense effort, effective global collaboration and innovative solutions. In setting the SDGs, the international community has recognised the need to address the factors which cause and perpetuate poverty. Road traffic injury is one such factor, yet its relationship with poverty has not been widely appreciated. This relationship is consistent with the way poverty interacts with wider health issues. For health and poverty, a clear cyclical pattern is apparent – that poverty creates ill-health, and ill-health leads to further poverty.¹ In the same way, road traffic injury and poverty are intrinsically linked. Children from poor families are vulnerable to road traffic injury; when tragedy strikes, they suffer severe and protracted effects; and too often, victims and their families are locked into a cycle of poverty.² This pattern is apparent in countries of all income levels yet as this report will highlight, the relationship between road traffic injury and poverty is even more acute in low- and middle-income contexts. With a burden multiplied across countries and regions, it is apparent that globally, road traffic injury serves as a brake on poverty eradication and development.

Road traffic injury and poverty combine to threaten and undermine child rights, sustainable development and new urban agendas. It is the result of an approach to economic development which is poorly planned and unsustainable, where the vulnerable and the disadvantaged are more heavily impacted as they are not afforded the levels of safety benefiting the rich; where young people living in poverty are unprotected and routinely subjected to unacceptable risks and health threats. It is an approach where all too often, poor families are condemned to further poverty, limiting life-chances for them and their children. This represents a breach of the Convention on the Rights of the Child, which commits governments to meet legal obligations including Articles specifically relating to injury prevention and child health. The fact that we are failing to provide adequate protection for children on the roads, and particularly those living in poverty and most exposed, is surely unacceptable.

As an integral part of the new global agendas on sustainable development and urbanisation, - as advanced by the SDGs and Habitat III - we must address the scourge of road traffic injury particularly as it impacts the poorest and most vulnerable in society. Of paramount importance should be the adoption of a 'children first' focus ensuring that transportation systems are designed to work for the health, well-being and needs of children. A core objective should be a safe and healthy journey to school for all children. The measures needed are practical and cost-effective, yet too often they are not in place particularly for the poorest. As this report will outline, key priorities comprise this 'children first' agenda, and they include: ensuring safe routes to school for all children, with walkable pavements, safe road design and effective speed management; prioritising pedestrians and cyclists in urban planning; increasing investments in safe infrastructure for non-motorised transport to encourage active, low carbon, mobility; improving vehicle safety on school journeys with helmets for motorcycle passengers, seatbelts and safety checks for school buses; and also encouraging policies to reduce vehicle emissions and improve air quality.

This report is initial advocacy research focused on road traffic injury. It touches on issues of air quality but this is not the subject of this report. A broader agenda, including air quality, is being advanced by a new SDG partnership, the Global Initiative for Child Health and Mobility - of which this report is a first advocacy output. This initiative provides a platform for commitment and action to address road traffic injury as a sustainable development priority, focused on the objective of a safe and healthy journey to and from school for every child by 2030. This is an agenda which governments and the development community must embrace and advance as a priority. The solutions are well known and readily available. As this report will outline, with straightforward measures, and evidence based programmes to improve safety, lives can be saved and livelihoods protected. But to guarantee that we really 'leave no-one behind' we need the political will, funding and the global support to ensure that the policies and solutions are in place for all.

ON THE FRONTLINE: THE POOREST AND MOST VULNERABLE



Cecilia Chibulunje lives in Mbuyuni, one of the poorest areas of Dar es Salaam. She was only eight years' old when she was hit by a 'bodaboda' motorcycle just a few metres from her school gates. Cecilia was immediately knocked to the ground, hitting her head on the dusty concrete outside her school. There was no ambulance, no emergency services on the scene, there very rarely are in the poor district of Mbuyuni. Severely injured, Cecilia was hospitalised, but with a lack of nursing staff for the poor in Dar es Salaam, it was left to her grandmother to remain by her bedside for weeks to look after her. Cecilia's injuries were a real setback for a bright little girl who loved reading and writing. For Cecilia, education had promised a route from poverty. Yet in the few seconds it took for the motorcycle to hit little Cecilia, her hopes for a brighter future had been crushed.



Cecilia Chibulunje

Cecilia's story is one which is repeated with frightening regularity across Dar es Salaam where children from the city's many poor neighbourhoods and informal settlements are exposed to a motorised environment which offers little protection (see pp.15-18). And as this report will show, the crushing impact of road traffic injury upon children living in poverty is one repeated time and again across the developing world.

Tackling the negative health burden on children caused by unsafe transportation is an urgent priority. Low- and middle-income countries in particular are facing unprecedented demographic pressures with the rapid pace of urbanisation. Globally, urban population levels are increasing faster than at any time in history. In the period to 2030 covered by the Sustainable Development Goals (SDGs), the percentage of the world's population living in cities will rise from 50% to 70%. In many cities the urban poor will make up the majority of the population, as will the youth demographic – by the time we reach the SDG deadline it is estimated that as many as 60% of all urban dwellers will be under the age of 18.³

With this population shift comes immense social pressures, the growth of settlements – in many cases informal, slum dwellings – and rapid urban expansion. And alongside it there is an explosion in the rate of motorisation across low- and middle-income countries. The growth of urbanisation, the expansion of human settlements and the accompanying pressures of poverty, together with the increasing numbers of young vulnerable populations, requires a new approach both to city planning and sustainable mobility generally. The current response of building roads and designing networks which prioritise the car is clearly not sustainable. Prioritising access for the private car may aim to address congestion, but in time it is shown to stimulate further car use, a need for more roads, and an increase overall in traffic fatalities.⁴ A different approach to design can be adopted, one which places pedestrians, the vulnerable and non-motorised transport users at the top of the hierarchy and adopts a "safe system" approach to traffic safety.

We are at a critical juncture in global development. Partnerships and funding allocations to meet the SDGs are being formulated and advanced, and the world is looking ahead to the Habitat III New Urban Agenda. In this global policy context, road traffic injury – the world's leading cause of death for children and adolescents over the age of 10 – has been recognised as an urgent priority for action.

It is included in two SDG targets, for health and cities. And there are solutions, readily available. Ensuring every child can walk to school along a safe footpath, separated from traffic, should be as obvious as providing inoculations against disease. But it doesn't happen. Using simple approaches to reduce traffic speed in areas where children live, play and learn should be common practice, everywhere. But this is not the case. Designing provision of essential services – healthcare, shops, markets and schools – to be easily accessible to those without a car should be a fundamental policy and planning principle. But too often this is neglected.

This report makes the argument for these cost-effective interventions, which can complement wider efforts by governments, city authorities and the international donor community to tackle poverty, inequity and ill-health. We will show examples from across the world of communities which are prioritising children and the poorest, most vulnerable sections of society, people who will never have access to a private car, and need to be able to walk, cycle, ride a motorbike or take public transport safely. Every child deserves the best chance in life. Every child, no matter on which side of the street they are born, should be able to cross over and take advantage of opportunity – for education, for friendship, for leisure – without facing daily traffic danger and the risk of a life-changing or life-ending injury.

ROAD TRAFFIC INJURY, POVERTY & HEALTH



ROAD TRAFFIC INJURY, POVERTY & HEALTH

Road traffic injuries and poverty are interlinked. Poor people, children and their families are more likely to die or be seriously injured than those with higher incomes, and the economic impact on people with low incomes can be more significant, pushing people deeper into poverty or limiting their future economic potential.

Globally, road traffic incidents are one of the main causes of death and injury among children and young people, and rates are higher among poor communities. The reasons for this are complex, but poor people are more likely to live in areas which are more dangerous as these are the only areas that they can afford or are available - for example informal dwellings near major arterial roads. They are also more likely to be exposed to risks as their transport modes are more vulnerable - they may be more reliant on walking and cycling, and may have greater exposure to such risks. Typically there is less investment in and provision of road safety in poorer communities and other social factors, such as levels of road safety education, adequacy of supervision and safe spaces to play can all play a part.

For children, injury, and road traffic injury is heavily linked to the local environment and so the surrounding context of a deprived area plays a strong part. This has led researchers to conclude that injury is the area of public health with the steepest social gradient with road traffic the most common cause of injury for children living in poverty.⁵ In urban areas risk factors such as proximity of housing to major roads mean that children living in poverty are also exposed to higher levels of air pollution, which can affect their lung development and cause respiratory illness, with research showing that these health impacts can be more prevalent among the poor and the young.⁶

The global figures reveal a severe and unacceptable health burden posed by road traffic injury upon children. And from the research, it's clear that we are facing a development crisis impacting heavily on the young. Overall, the burden from road traffic injury is unacceptably high for developing countries. The WHO's Global Status Report on Road Safety 2015 shows that at over 1.2 million people die each year in road traffic incidents and up to 50 million are injured, with low-income countries having the highest road traffic death rates, at 24.1 fatalities per 100,000 population on average compared with 9.2 in high-income countries.⁷

Road crashes are the leading cause of death among children aged 10 and over in both developing and developed countries. There is only a comparatively small body of research focusing in detail on child road traffic injury in developing country contexts. But the few more in-depth studies undertaken do indicate that situation is serious. A recent study in Hyderabad, India for example found that 11% of boys and 6% of girls reported a road traffic injury over the course of a year.⁸

There is extensive evidence from developed countries that children from poorer communities are more likely to have higher road traffic injury rates. The relationship between deprivation and risk of road traffic injury is particularly strong for children. This is a relationship that has been well established in research from high income countries. The most comprehensive review of international evidence concludes that "children from lower social positions and in more deprived socioeconomic areas are quite consistently more at risk than others."⁹ In the UK research shows that children from poor communities are more vulnerable to

FIGURE 1: MORTALITY IN CHILDREN AND ADOLESCENTS, 1990-2013

Top 5 Causes of Death by Age Group in Developed and Developing Countries, 2013

DEVELOPED COUNTRIES

RANK	AGE <1 y	AGE 1-4 y	AGE 5-9 y	AGE 10-19 y
1	Congenital anomalies	Congenital anomalies	Road injuries	Road injuries
2	Preterm birth complications	Road injuries	Drowning	Self-harm
3	Other neonatal disorders	Drowning	Congenital anomalies	Interpersonal violence
4	Neonatal encephalopathy	LRI	Brain cancer	Drowning
5	Sudden infant death syndrome	Fire and heat	Leukemia	Other neoplasms

DEVELOPING COUNTRIES

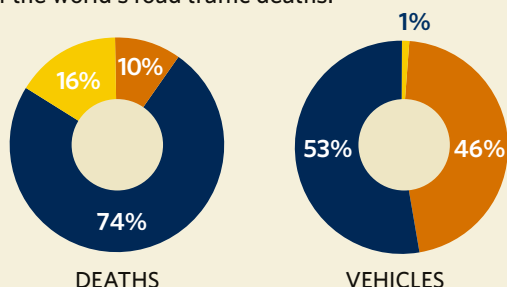
RANK	AGE <1 y	AGE 1-4 y	AGE 5-9 y	AGE 10-19 y
1	Preterm birth complications	Malaria	Diarrhea	Road injuries
2	LRI	LRI	LRI	HIV/AIDS
3	Neonatal encephalopathy	Diarrhea	Intestinal infectious diseases	Self-harm
4	Congenital anomalies	Protein-energy malnutrition	Malaria	Drowning
5	Neonatal sepsis	Drowning	Road injuries	Intestinal infectious diseases

LRI=lower respiratory tract infections

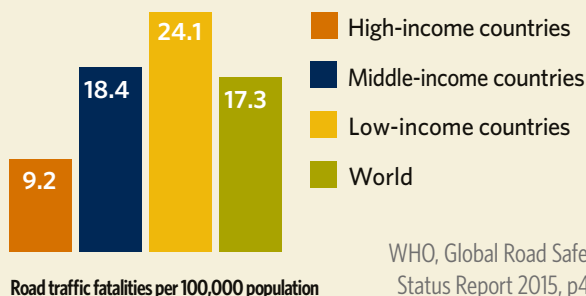
Analysis of the 2013 Global Burden of Disease data shows that while communicable diseases such as malaria and diarrhoea are a severe burden on younger children, in the second decade of life, road traffic injury becomes the leading cause of death. IHME/JAMA 2016

FIGURE 2: ROAD TRAFFIC FATALITY RATES, COUNTRY INCOME LEVEL

Although low- and middle-income countries have only half of the world's vehicles, they have 90% of the world's road traffic deaths.



Low-income countries have the highest road traffic death rates.



WHO, Global Road Safety Status Report 2015, p4,5

road traffic injury. The link between poverty and pedestrian road traffic injury among children is equally apparent. Children in the lowest social class in England are more than four times more likely to die as pedestrians than children in the highest social class.¹⁰ Other studies have found that children from the most disadvantaged backgrounds are between 10 and 21 times more likely to be killed as pedestrians than peers from the highest socio-economic

group.¹¹ In a further study specifically focused on child pedestrians it was found that of child pedestrian injuries as a whole, 40% came from the most deprived 20% of society.¹² In US research, child pedestrian collisions were found to be 9 times more frequent in the poorest quartile of neighbourhoods than the richest in south California.¹³ Similarly in Canada hospitalisation rates were 4 times higher for children from the poorest neighbourhoods.¹⁴

BOX 1:

A BRAKE ON GLOBAL POVERTY REDUCTION

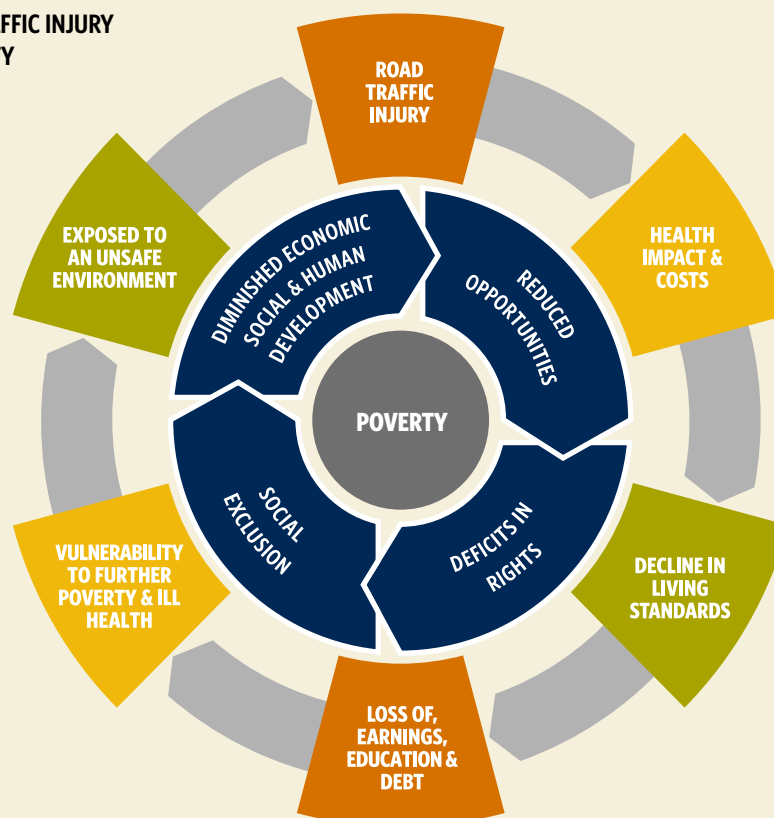
In addition to the direct impact on poor people of road traffic injuries, the wider economic costs of failing to address road safety have a deeply damaging cost for low-income countries and communities. At least 500,000 people are estimated to be killed and 6.5 million seriously injured every year in just 82 low and lower-middle income countries, at an economic cost of \$220 billion.^A This economic impact equates to around 5% of gross domestic product, a cost developing nations can ill-afford – the costs amount to more than total OECD overseas development assistance which in 2015 was \$131 billion. The cost of road crashes acts as a brake on poverty reduction efforts (every 1% increase in economic growth is estimated to reduce poverty levels by 0.7%) and prevents expenditure on a wide range of societal goods.

Road crashes overwhelm under-funded and over-burdened health systems, with anecdotal evidence that road traffic victims account for between 40-60% of surgical admissions in some developing countries.^B Health systems ill-equipped to deal effectively with road trauma exacerbate the problem: poor people who are injured are treated at poorly equipped hospitals by overstretched medical staff. Cheaper treatment solutions can result in longer rehabilitation and imperfect recovery, reducing the ability of victims to re-enter the employment market at a pre-crash level. Recognising and quantifying the overall costs and societal impacts of road traffic injury, not least for economic development and poverty reduction, is essential to understanding the investment benefit.

^A iRAP.2014. A business case for safer roads. [Online] Available at irap.org/en/about-irap-2/a-business-case-for-safer-roads

^B K. Watkins, and D. Sridhar. 2013. Road traffic injuries: the hidden development crisis. Policy briefing for the First Global Ministerial Conference on Road Safety

FIGURE 3: ROAD TRAFFIC INJURY & CYCLE OF POVERTY



Adapted from:
Disability and
Poverty Cycle, DfID
Disability, Poverty &
Development Issues
Paper, 2000, p4

The pattern of road traffic injury globally shows that it is developing countries which bear the heaviest burden and universally within this, it is the most disadvantaged communities that suffer the most. Research focusing on regional income level as related to child injury specifically has concluded that it is the most resource poor income regions suffering the highest rates of child injury, including road traffic injury.¹⁵ Given that developing countries account for the bulk of the global road traffic injury burden, and that research at least from higher income countries has established a correlation between road traffic injury and child poverty it perhaps should be expected that there would be a strong relationship between road traffic injury and child poverty in low-and middle-income countries.

The available evidence suggests that poor communities are significantly more at risk of road traffic injuries than their more affluent counterparts. In South Africa, research found that traditionally poorer socio-economic groups had higher injury rates.¹⁶ In India, those from disadvantaged communities were found to be more likely to be involved in road traffic crashes and mortality from road traffic injury was found to be higher among poor communities.

Compounding the higher levels of incidence for poor people, access to healthcare was also often more limited increasing the risk of fatalities and long-term health impacts.¹⁷

The relationship between poverty and road traffic crashes is a product of multiple interacting factors, which may vary between locations. It's clear that poor people in developing countries face high pressures associated with mobility which can make them more vulnerable. A lack of income constrains choices and opportunities. Poor people in developing countries frequently walk or cycle to reach work, school, and other services as they cannot afford motorised transport.¹⁸ Many developing countries lack affordable mass transit systems, and infrastructure for walking and cycling is often poor quality and incomplete, making journeys less safe and limiting access to employment.¹⁹ Many poor people in developing countries cannot afford accommodation near city centres, which leads them either to live in substandard slum dwellings in precarious locations, such as next to railway lines and highways, or to live on the periphery of the city and face long and expensive journeys to find work.

In Mumbai for example, research shows the very poor tend to work closer to home than other groups, and



mostly within walking distance.²⁰ While the highest overall expenditure on transport is among high income groups, the poor spend a higher proportion of their income: around 15% compared to 10% for other groups. Given the limited budgets, this means even less for food and basic costs. The research also found that the non-poor were able to access transport hubs more easily, living nearer to railway stations and therefore had the ability to travel further to access higher paid jobs.

Poverty and exposure to unsafe road environments

Road infrastructure in developing countries is often unsafe, particularly in areas where poor people live. Studies from the U.S. found that children from low-income families tend to live in dense urban residential neighbourhoods with high traffic volumes and a lack of defined play areas.²¹ Similarly, child road injury deaths in Pakistan were found to be concentrated in a small number of neighbourhoods with high numbers of children per acre and a lack of safe play spaces.²² A study into risk factors for children's road traffic injuries in low-income areas of urban Peru found that the most significant factors associated with child road traffic injuries were high vehicle volume, speed, lack of road markings, the presence of street vendors, and the number of children living in the home.²³ Experts conclude that the higher levels of risk for the poor is most likely to be due to different exposure to environmental hazards rather than behavioural factors.²⁴

Reliance on unsafe modes of transport

One significant reason why poor people are more at risk is they are more likely to be reliant on vulnerable modes, such as walking, cycling, two-wheelers or informal minibuses and offered little protection from infrastructure or vehicles. 49% of all road traffic deaths are among pedestrians, cyclists and motorcycles.²⁵ Research has found that poorer people are forced to choose more dangerous transport modes, or to travel in riskier environments. Many are aware of the risks but cannot afford safer alternatives and do not have safe infrastructure provided.²⁶ The International Road Assessment Programme (iRAP) has assessed over 250,000km of roads in 60 countries, and found that 83% of roads where pedestrians are present with traffic flows of more than 40km/h have no formal pavements.²⁷ In Nairobi iRAP found that 95% of the roads assessed had high pedestrian flows yet only 20% had pedestrian footpaths.²⁸

A study in Karachi found that overloaded minibuses without seatbelts also resulted in road traffic injuries among children.²⁹ A survey of press reports in Nairobi in 2015 shows reported child casualties from crashes involving overcrowded 'Matatu' minibuses at 30 per month. Children living in poverty are more likely to travel by these modes and therefore are exposed to greater risk. In addition, if they have to travel further to reach schools and health facilities then their risk levels will

be even greater as the duration of exposure is longer. Another factor in the exposure to unsafe modes of transport is that in low and middle income countries, vehicles available to poor people are lacking in safety equipment such as crash helmets which can be priced at unaffordable levels, costing a higher proportion of people's incomes than in developed countries.³⁰

Lower levels of supervision and support

The degree of parental supervision is a factor that seems likely to affect poor children's risk of injury.³¹ Children are still developing their cognitive and physical functions and do not have the same capacity as adults to assess risk and cope in different traffic situations. They may also be more vulnerable to crashes as they are unable to see past obstacles or assess speed. It is common in many developing countries for children living in poverty to walk long distances to school by themselves or accompanied by their siblings. Extensive research on this issue is lacking, but one study in Southern Ghana showed children as young as four making their own way to school, and also highlights how children living in poverty might also be expected to undertake productive activities, such as street selling, or transporting goods to market, which also exposes them to greater risks.³²

Impact of road traffic incidents on child poverty

Poor people are more likely to be involved in a road traffic crash, but are also more likely to become or remain poor as a consequence. Poor people may also be less able to pay for hospital care, and may therefore receive lower quality treatment.³³ The consequences are widely felt as a crash that kills or seriously injures an income earner can have considerable impact on the livelihoods of poor households.³⁴ Indeed any household experiencing such a loss may face considerable economic distress, but poor families may be particularly vulnerable as they may lack insurance or ability to draw on savings or borrow. The OECD DAC guidelines on poverty and health state that: "Loss of an income earner, the substantial cost of prolonged medical care, particularly when administered in hospital, and loss of household income because of disability can precipitate poverty in the affected household. The ripples of this loss can be felt by the extended family and by informal community support systems that are often called upon to contribute towards medical bills and care for the bereaved family."³⁵

According to the WHO, "for everyone killed, injured, or disabled by a road traffic crash there are countless others deeply affected" – this inevitably will include children who lose parents or who experience economic hardship.³⁶

A detailed study in Bangladesh found that 75% of poor households and 59% of non-poor households experienced a decrease in their standard of living after suffering a road traffic injury. The majority, (71%) of poor households decreased their food consumption, 65% arranged a loan and 35% sold assets. Over a third (33%) had to take on extra work. A move into poverty can be seen after the crash with 33% of urban poor households and 49% of rural poor households not poor beforehand. On average, between 4 – 6 months of schooling was missed by a seriously injured victim.³⁷

Employment opportunities suffer. A study in Nigeria found that 30% of people who experienced a road traffic crash were permanently disabled and 14% were unable to return to work. Households coped in different ways, with the majority reallocating labour between household members, although one-third of households still experienced a loss of income overall, and 5% missed school days.³⁸ In Vietnam, research found that 26% of road traffic victims became impoverished as a result of the crash with total costs 12 months after discharge from hospital totalling \$804, nearly 1.2 times the average annual income.³⁹

A detailed study of hospital costs of road traffic crashes in India, found that the poorest group of road traffic victims spent around half of their annual household income on medical care.⁴⁰ They were also seven times more likely than the richest group to have to resort to distress financing (e.g. borrowing money from relatives/ friends, taking loan from banks/other lenders, or selling assets).



The OECD recommend development of risk management systems to protect low-income households from the financial impacts of road traffic crashes.

These could include compulsory vehicle insurance and affordable health insurance or public health schemes – unfortunately these may be out of reach for the poorest households.⁴¹

Air quality

The focus of this report is road traffic injury, but acting in combination to impact child health are the air quality effects of road transport. Alongside and compounding the risk of road traffic injuries children are exposed to a further serious health burden of air pollution imposed by traffic congestion and high volumes of vehicles in cities. Poor outdoor air quality is estimated to have caused 3.7 million premature deaths globally in 2012, with the majority of these deaths (88%) in low- and middle- income countries.⁴² At least 200,000 deaths a year are likely to be directly attributable to vehicles.⁴³ With growth in the number of vehicles, such deaths could increase by 50 percent worldwide by 2030 from 2013 levels, in the absence of new policies.⁴⁴ The World Health Organisation urban air quality database, which covers 1600 cities across 91 countries shows that only 12% of people live in cities which meet WHO air quality guidelines, with around half exposed to levels 2.5 times higher, putting them at particular risk of serious long-term health problems.⁴⁵

Motor vehicles represent the principal source of air pollution in many communities in developed cities,

and concentrations of traffic pollutants are greater near major roads. Children are more susceptible to health issues caused by poor air quality.⁴⁶ Air pollution is a toxic, carcinogenic and invisible killer, seriously affecting the development of children's lung function and responsible for a huge burden of health. Children are exposed to higher concentrations of air pollutants as these tend to settle nearer to the ground. Children also breathe at a higher rate than adults, and have less effective particle filtering in their nasal passage to block the movement of harmful particles into the lungs. Because children typically spend more time outdoors than adults, they have increased exposure to outdoor air pollution.⁴⁷ Children living near major roads are more likely to have chronic respiratory problems.⁴⁸ Furthermore, as a UN Habitat report on children and sustainable mobility has highlighted, conditions such as asthma are more prevalent in vulnerable populations including children and the poor.⁴⁹

On the other hand, improved air quality can result in health benefits. Recent evidence suggests lowering levels of air pollution can improve lung development. A study in California found that around half as many 15-year olds in 2011 compared with 1998 had significant lung defects. Over the same period air pollution levels fell in Los Angeles, with nitrogen dioxide reducing by 33% and fine particles by 47%.⁵⁰ Further research is needed to understand and highlight the impact of air pollution on child poverty across low- and middle-income countries, but the issue is a critical one for global development.

Conclusion

Children living in poor urban communities are exposed to severe risk from road traffic injury, and unacceptable standards of safety with levels of protection on the roads far lower than their more affluent counterparts. The aftermath of road traffic injury can often mean that families already living in poverty suffer further economic hardship, ill-health and reduced opportunities. This is a pattern in countries at all income levels, though the effects are more severe for people in lower income settings. One of the advantages of cities and the reason people move to them is the fact that they offer multiple economic opportunities and the chance to improve their livelihoods and life chances. Mobility and transport services are a vital part of this, however, accessing these safely is a key challenge, particularly as people move

around the cities in order to travel to school and work. Whilst cities can offer the potential for people to move away from poverty, the reality for people affected by road traffic crashes can be catastrophic. And it is just at the point where families are becoming mobile to engage in economic activities, their children travelling to access education, that they become most at risk. The very activity they seek to find a route from poverty often places them at risk of further poverty and ill health. Similarly, children in many of the major conurbations face unacceptable levels of air pollution that threaten their healthy development. It need not be this way. As this report will go on to outline, solutions to address road traffic injury and establish a more sustainable alternative are readily available and can be feasibly and effectively introduced in low income settings. It is critical that mobility in developing countries keeps children safe and the air clean. Urgent action is needed.





EACH DAY, EXPOSED TO DANGER

Sub-Saharan Africa: a burden on children in poverty

Across the slums and informal settlements of sub-Saharan Africa, and in communities situated near high speed peri-urban roads, there is a largely unrecognized epidemic of road traffic injury. Children are on the front line, exposed to the dangers of traffic each day on their journey to and from school with little protection. Vulnerable on the roads, and unable to cope with the consequences following injury, as the following cases show, the poor and the young suffer multiple, ongoing consequences of road trauma.

The outlook gives little cause for comfort. Africa is urbanising and motorising at a rapid pace. The

future may be one of rapidly increased rates of motorisation in Africa, yet the region already has the highest rate of road death per population combined with the lowest current vehicle numbers. African urban populations are on the rise, many expanding by over 60% over the next 15 years. These trends combined with a rapid expansion of young people in cities, the 'youth bulge', create a perfect storm for road traffic injury. For this region as with other low and middle income regions already suffering high numbers of child road deaths, demographic shifts combined with rapid motorisation and low levels of safety, should spur an urgent reaction.

Dar es Salaam's sprawling network of informal settlements

Dar es Salaam: low income, high risk

Dar es Salaam is urbanising at a staggering rate. The city is in the throes of a population explosion – currently just over 4 million, it is predicted to expand by 50% by 2025 according to the African Development Bank.⁵¹ The city is on course to becoming Africa’s fastest growing urban centre. With such urban growth comes the prospect of economic opportunity, and the most visible signs of development, the crane filled skyline, the expansion of the port and the proliferation of new infrastructure attest to this. Yet Dar es Salaam is also a city of crippling poverty. Urban planning has for many years struggled to cope with rapid population growth, and urban sprawl abounds. With this has come the burgeoning of urban slums and informal settlements, which account for over 70% of the city’s population. For the urban poor, the public health challenges are immense. An estimated 40% of the city’s population have no access to clean tap water, and only 5% have access to a formal sewerage system.⁵² The city environment exposes the vulnerable, and children in particular, to severe public health threats with cholera and typhoid outbreaks common. In such an environment, road traffic injury features all too prominently in the mosaic of public health threats – yet the immense burden it imposes on children and families is barely recognised. With negligible levels of safety for these communities comes intolerable exposure to road traffic injury.

On the streets of the many poor neighbourhoods of Dar es Salaam, children walk unaccompanied, exposed to fast moving traffic, forced to negotiate dangerous roads without separate footpaths or safe crossing points. Those that can afford to travel on some form of motorised transport face the combined threat of unsafe vehicles, excessive speeds and chaotic road conditions.

In Tanzania, the NGO Amend undertakes work to improve the safety of roads around schools, funded by donors including the FIA Foundation. Amend’s School Area Road Safety Assessments and Improvements (SARSAI) programme implements cost-effective road safety improvements that are proven to reduce injury rates around schools. Unlike in developed countries, there is little systematic data kept about road crashes and injuries. Amend is working to change this, and as part of this project has surveyed over 15,000 school children from 22 schools in Dar es Salaam to understand more about the nature of road traffic injuries, the causes and risk factors. From these surveys, Amend estimate that the road traffic injury rate among school children was around 1.3% annually.⁵³

Road safety has a direct link to children’s ability to get to school. Without safe places to cross roads and measures to reduce the speed of vehicles, many children arrive late. Others may be killed or injured. Some miss exams or key parts of their education, and others never recover to be able to return to school.

For children in Dar es Salaam, the journey to school is dangerous, as they face a chaotic mix of fast moving vehicles and a lack of safe routes for pedestrians. Everyone knows someone who has been killed or injured by a vehicle. Amend spoke to primary school children, who described feeling “scared” crossing roads near their schools. Many of these children will walk on their own, particularly on the way home from school, as parents are busy working or undertaking other daily tasks. In order to cross safely, the children have been trained to ask for help to cross the road, and most do so. In some areas, including those where Amend have been working, crossing patrols have been established. Sometimes this is in response to a serious crash, and are organised by older children (aged 11 to 13) wearing reflective jackets. Yet most schools don’t have crossing patrols - only around 10 of the 400 state primary schools in Dar es Salaam have them, and these only cover the roads directly outside the schools.



Dar es Salaam’s Mkoani settlement

BOX 2:

BODABODAS: CHAOS AND POVERTY



One of the most dangerous forms of vehicles in Tanzania are motorcycle taxis – known as ‘bodabodas’, which travel fast, and weave in and out of the traffic, and often cut down the dusty and informal roads in low income neighbourhoods. Charging less than a dollar for a journey of a few kilometers, bodabodas offer a cheap and convenient form of motorised mobility to lower income communities, but at a massive price – Amend estimate that 48% of road traffic injuries suffered by school children involved being hit by a bodaboda. In common with much of East Africa, bodaboda numbers have increased rapidly over the past few years. According to official figures in imports alone there were 1,884 motorcycles in 2003, a figure which had risen to 185,110 in 2014.

The authorities have struggled to regulate the bodabodas. They are associated with high levels of crime, and are notorious for their threats to personal safety with attacks, harassment particularly of female passengers and mugging, rife. With their contribution to road traffic crashes, rather than regulating and implementing speed management, the authorities have instead banned bodabodas from the centre of the city. The result is that bodabodas have been pushed further out to the poorer neighbourhoods and informal settlements where coverage by law enforcement is either much lower or non-existent. As a consequence the large numbers of bodabodas speed on poor quality back-roads ill equipped to cope with such traffic, and offering no protection to the high numbers of pedestrians and non-motorised traffic.

The bodaboda riders themselves are young, many are teenaged boys and youths, untrained and uneducated, with the motorcycles providing a popular and accessible form of income averaging \$5-\$12 a day.

Cecilia Chibulunje lives in the poverty ridden Mbuyuni district of Dar es Salaam with her grandmother and father. The family are poor, and rely on Cecilia's grandmother for income as her father is unemployed and has no formal work. Her father, who is still in his 20s, left school after finishing primary school, and has struggled to find work since. Cecilia's mother became pregnant when they were both teenagers. She was so poor that her family could not afford to look after the baby, so Cecilia's grandmother took the child in. She is the main breadwinner for the family, earning around \$50 a month.

When Cecilia was eight years old she was involved in a road traffic crash near the school. She was admitted to hospital for two weeks and had a further two weeks of clinic. In total, the treatment cost \$250 – the equivalent of five months' wages for the family. However, the burden was compounded by the fact that the grandmother had to go into hospital for two weeks as there was no nursing available, and in total was unable to work for a month. This 'double burden' of lost income on top of medical costs puts real financial pressure on households. Cecilia herself missed a month of schooling, which had a serious effect on her education, and she did not perform well in her exams.

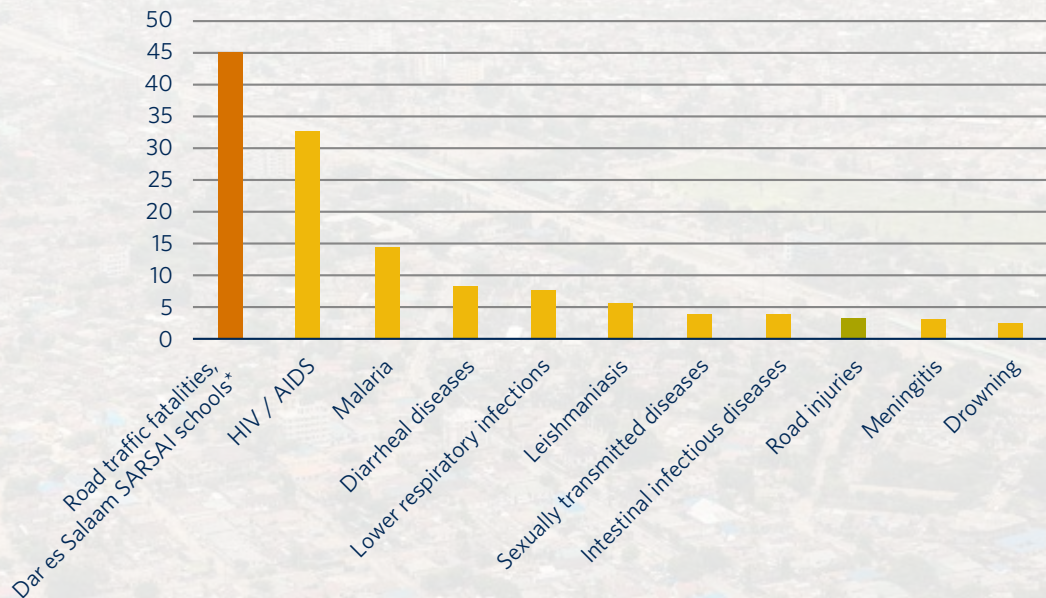
Such cases are too common. Amend also spoke to another child who was hit by a motorbike in the same area. She was walking along the footpath when a bodaboda motorcycle taxi hit her. The bodaboda was driving fast and on the footpath, and knocked her to the ground where she hit her head. The driver did not stop. Teachers took the child to hospital, and although she was able to be discharged that day, she missed almost a month of school due to her injuries. The parents had to pay the full costs of the x-ray and check-ups at hospital – costs that they could not afford. They therefore had to ask their neighbours and relatives for help, and they are still in debt as a result. This ripple effect hits other family members who then have to pay for the people affected.

Amend told us: "Such cases are common in Dar es Salaam. In the poorer neighbourhoods, we don't have protection on the roads for these children. There really is no safety. There's no control of the bodaboda. The infrastructure is poor – no safe crossings, no sidewalks, not any speed enforcement. Injuries are too common and when a child is hit, the family cannot afford care. It becomes a huge ongoing burden on a family, there's the costs of care which can totally drain income and savings. Then there's enormous loss of earnings as family members often have to stop working and look after their injured relatives."

Amend has undertaken extensive household survey research through a sample population of 15,000 children in 22 schools. Similar to Cecilia Chibulunje, these children are poor – the average family income is Tsh 100,000 to Tsh 200,000 per month (about \$50 – \$100 per month). When calculated per 100,000 population the fatality rate experienced by these schools is high, comparable to the health burden caused by other major public health crises. The rates for diseases shown in fig 4 are national while the road traffic fatality rate is localised according to the schools covered by the Amend research, but nevertheless the data does broadly illustrate the impact of road traffic injury on 5-14 year old children. This graphic only covers fatalities from road traffic at 45/100,000 population. The injury rate for the Dar es Salaam schools is significantly higher with 1.3-1.4% of the sample suffering an injury, corresponding to 1,300 injuries per 100,000 population.



FIGURE 4: TANZANIA - DEATHS / 100,000 POPULATION (5-14 YEARS)



IHME Global Burden of Disease Study 2013 (GBD 2013)
 *The rate for SARSAI schools is based on a sample of 15,000 children in 22 schools

Hospital costs

Hospital costs can be a major burden for families of those with road traffic injuries. Hospital costs can average \$50 to \$100 per week for those with trauma injuries. An x-ray alone can cost \$70, and surgery can be \$150 for a small procedure, and several hundred dollars for a more serious operation. Too often the costs of treatment will rob a family of their income for an extended period. In some cases, where the family cannot afford the surgery needed, doctors might choose to amputate. Others will have to borrow money or sell possessions in order to be able to afford treatment. Some may delay treatment, making the injuries worse and limiting the chance for a full recovery. Research assistants from the NGO Amend report such situations to be common following a road crash. If finances to pay for treatment are not available, doctors will wait as long as they can, but in order to deal with the succession of cases they will often be forced to make the decision to amputate rather than carry out the more complex and expensive surgery that's needed and would lead to greater chances of rehabilitation.

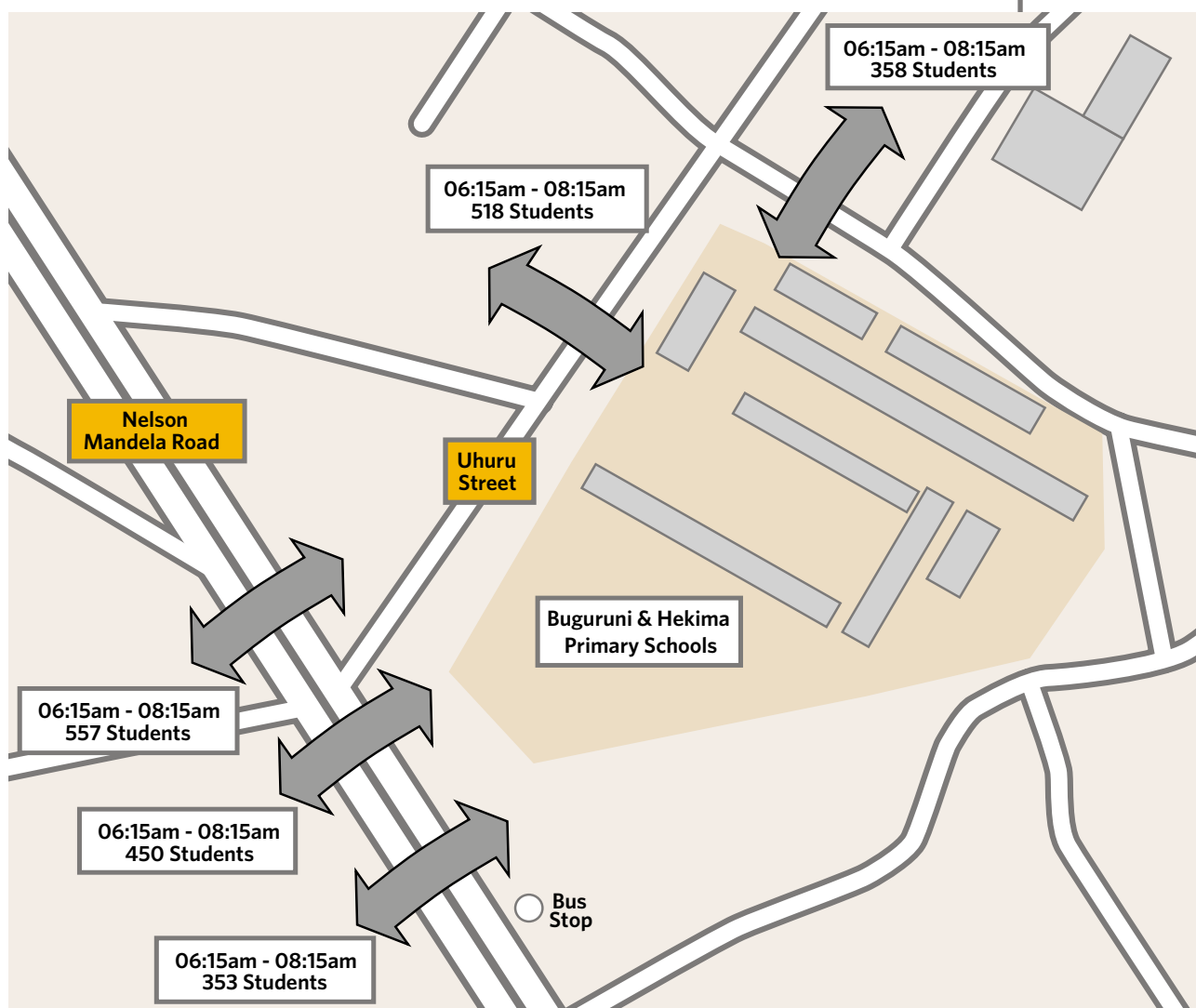
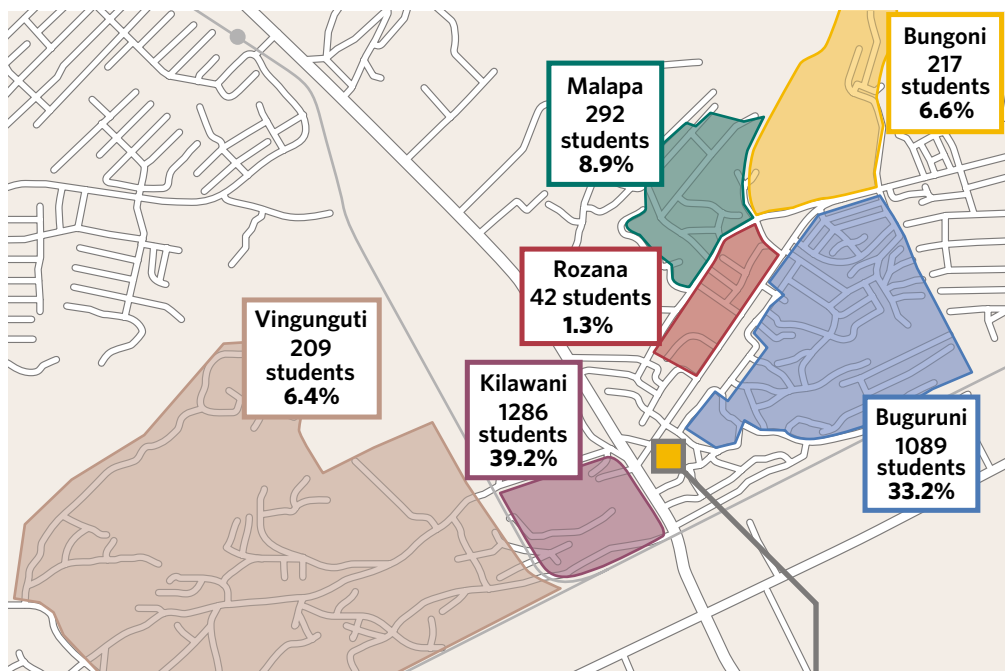
For the urban poor, who make up 70% of Dar es Salaam's population, even a minor road traffic injury can drain a family of several months' wages, and at the same time family members will typically be unable to work having instead to care for an injured relative. In this way, one road traffic injury can have multiple and much longer term effects, reducing family finances and resources, preventing continuing employment and imposing a severe debt burden. Education is also lost in cases where a severe injury leads to months off school for a child and also where a parent or carer is injured or killed.

In the poor neighbourhoods of Dar es Salaam protection for children on the roads is negligible, they face severe risks of road traffic injury each day, on every journey. And children face multiple burdens - from the injuries themselves, from loss of education and from the severe and ongoing economic impact. When road traffic injury hits, the effect on family life can be catastrophic, forcing families into greater levels of poverty. This situation is by no means limited to Dar es Salaam, and is endemic in towns and cities across much of sub-Saharan Africa.

THE BURDEN ON SCHOOLS

Buguruni & Hekima Primary Schools, Dar es Salaam, TZ

- Surrounded by two major dual carriageway highways & one single carriageway municipal road
- School Population (2014): 2,675
- RTI Injury Rate (2014): 2.2%
- Approx. 59 students injured (at least one killed) in 2014



Nairobi: impacting the urban poor

Kibera on the outskirts of Nairobi is one of Africa's largest urban slums. Conditions are miserable with dire sanitation, poor nutrition, huge unemployment and high rates of disease such as malaria and typhoid. Kibera's infrastructure and road conditions are of the poorest quality. Communities accept road traffic injury as a fact of life, and although there is little formal data, even a brief investigation reveals road casualties to be commonplace. Survey interviews carried out at the Nesco School, one of the slum's poorest schools, indicated a high level of road traffic injury. Of 225 children interviewed across 8 classes at Nesco, nearly half had either suffered following a road crash or had a family member killed or injured. There is little to protect the children as they make their way to their classes each day. Most walk, pavements are non-existent or in poor condition and there are no safe crossing points. Speed limits are absent or not enforced. According to head teacher Solomon Odhiambo, road injury is placing an intolerable burden:

"Just carrying out this survey on road injury was very tough. Children were shedding tears during the interviews. They still suffer after the trauma of what they themselves and their families have gone through. Then of course there are the physical effects. We don't have the facilities to properly provide access for the children who have become injured. We have had children who have missed long periods of school after they became injured. Too often we have children not attending school when their families are struggling to make ends meet after a parent or relative is killed or badly injured."

The families at the Nesco School are among the poorest in Nairobi. For those permanently employed, the average wage is \$2 a day. However, three-quarters of the parents at the school are unemployed and have no income. If families manage to find enough money for medical care following a road crash, they will often not be able to afford school books. And children will often miss school either as a result of their injuries or to help take care of other family members.

The situation is particularly acute in the peri-urban areas on the outskirts of Nairobi where there's a deadly combination of paved higher speed roads, growing population numbers in expanding settlements, a lack of any safety measures and extreme poverty.

St. Dominic's Primary School is located on a busy road with high speed traffic in Mwiki, Kasarani a sub-county of Nairobi. There are no safe crossings, few adequate sidewalks and no speed enforcement to keep the children

of St. Dominic's safe. A mix of road users – vehicles, bodaboda motorcycles and street vendors fight for road space. There is no designated crossing for 1,994 children who walk to school each day.

Eunice Kerubo is 10 years' old and attends class three at St. Dominic's. One of three children, her family live off around \$3 per day, a typical income at the school. She was hit by a speeding 'matatu' minibuss as she crossed to school. With multiple injuries to her leg, head and chest, Eunice was taken to hospital. As her parents could not afford an x-ray, Eunice went home without treatment. She waited four days before being seen by a medic and after a further four months her family was still trying to find money for medical care. In the absence of treatment, Eunice missed an entire three-month term. When she resumes school, it's quite likely she will struggle. St. Dominic's School reports three to four crashes involving their children each month. The situation at St. Dominic's is common. At many schools in poor neighbourhoods on the outskirts of Nairobi the basic measures to offer protection are lacking. And when affected by road traffic injury, families struggle to cope.

At Cheleta Primary School, also on Nairobi's outskirts, protection is virtually non-existent. Children are regularly hit, and the consequences are devastating. The story of 13 year old Robinson Ongae is typical. He was hit by a speeding car while crossing the road near his home. Robinson suffered severe head injuries and was transferred to Kenyatta General Hospital for surgery. Unlike Eunice, he received treatment but his family who earn barely \$3 a day, were left in debt as the medical costs were twenty times their monthly earnings. Robinson's school, relatives and friends contributed to the bill. However, the family are facing prolonged debt and are suffering even lower living standards as well as the trauma of coping with Robinson's injuries.



Eunice Kerubo and her mother

Ghana: highway of suffering

Road traffic injury is one of the leading causes of premature deaths in Ghana. The World Health Organisation estimate that nearly 7000 people die each year in the country, at cost to the country of 1.6% of its GDP.⁵⁴ The number of deaths has increased over the past decade, although the latest figures for 2013⁵⁵ indicate a slight fall compared with 2012, which offers hope that the trend may be changing. 42% of deaths are among pedestrians. Children are also particularly vulnerable. A study by Amend in Accra in 2009 interviewed over 5000 children across two typical communities and found that 172 had been involved in an RTI in the previous 12 months.⁵⁶

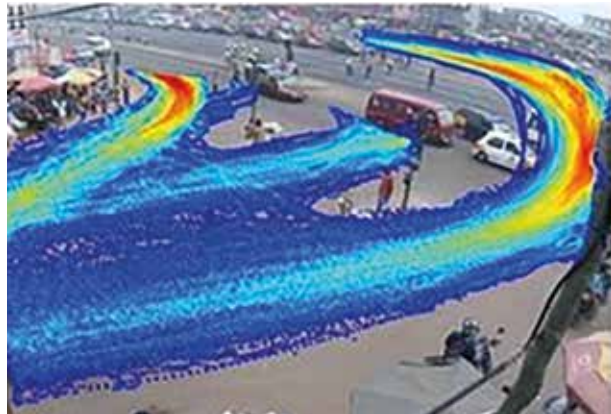
Of the ten areas with the most traffic crashes in Accra, six are on the N1 highway. This highway was rehabilitated with funding from the US Millennium Challenge Corporation and upgraded to a high-speed three lane 'George W. Bush' highway which opened in 2012. While the road has increased speeds and capacity, and many aspects of the design seek to incorporate improved safety features, there are particular challenges around junctions and conflicts between pedestrians and vehicles, particularly due to a lack of safe places to cross.

The Abeka area is in the north west of the city, to the South of the N1 highway. The neighbourhoods bordering the N1 highway from Kwashieman through to Lapaz and Abeka are classed as 'high poverty pockets'. Income levels in these neighbourhoods are mixed with some higher earners, but can be as low as \$2 per day ranging up to \$10 per day. Aggregate poverty across a range of indicators including income, waste facilities, water supply, urban services and housing give a high poverty classification. The N1 highway has been built through the centre of the Kwashieman community dividing it in two. Throughout the day, hundreds of people line up to cross the six lane highway with traffic travelling at speeds of up to 130km/h. Whole families stand by the road attempting to get across to their places of work, to services and schools.

iRAP has undertaken assessments of the roads in Accra. While it finds that large sections of the N1 road score well, including large stretches which rate five star or four star, indicating adequate safety, the junction areas score very badly – only achieving one star, indicating no adequate protection for vulnerable road users.

WRI has undertaken analysis at the nearby Lapaz junction of the N1 at Abeka to study the conflicts

between vehicles and pedestrians at the junction. Data indicates that there were 38 crashes at this junction in 2013, the sixth highest of all areas in Accra although none were fatal. WRI's 'heat map' shows red areas which indicate greater areas of conflict between pedestrians and vehicles.



N1 heatmap of pedestrian-vehicle conflict (WRI)



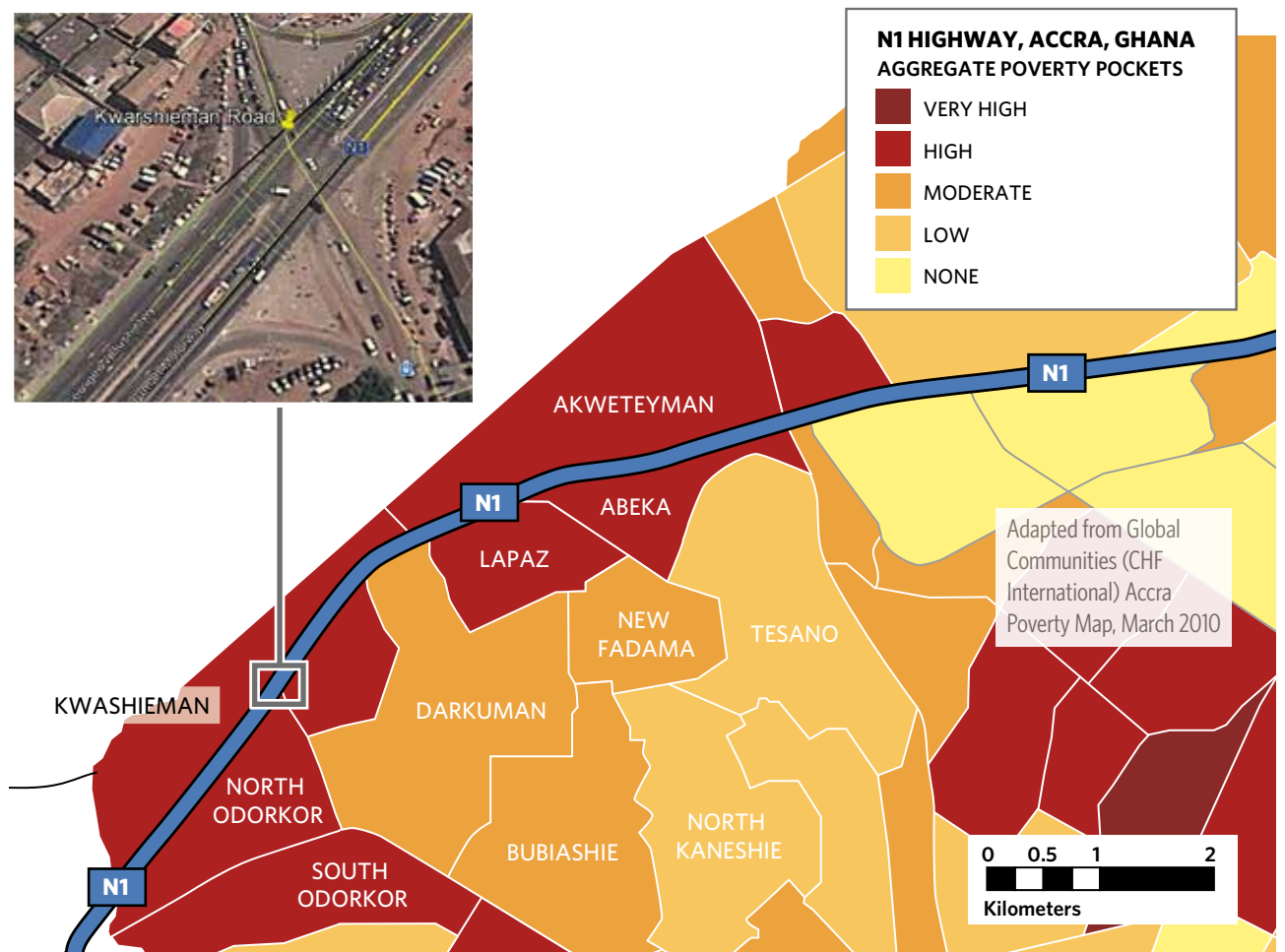
Ghanaian families in poverty lack protection on the roads

Children travelling to schools near the N1 highway are exposed to risks, even if they don't need to cross the highway itself, as fast-moving traffic leaves the motorway and joins local roads. Christ Mission School is only 750m from the N1. It has around 200 students, aged 5-15 years old, and there have been 3 road traffic injuries in the past 12 months. The children are generally poor, with household incomes in the range of \$2-\$10 per day. The school has a single speed hump installed directly outside the school gate, but apart from this there are no other safety measures. On its own it has only limited impact, and a more complete speed management solution is necessary. A child at the Prince of Peace Basic school, which is 700m from the N1 has also suffered a serious road traffic injury in the past year, with many other incidents including children.

EACH DAY, EXPOSED TO DANGER



Accra traffic, pedestrians and a mix of vehicles in close proximity



Global impact: crushing hope, destroying livelihoods

When families suffer road traffic injury, the effects can be devastating and long term. A pattern emerges where families suffer road traffic injury just at the point at which they are becoming increasingly economically active, or in the case of children, becoming more independent and mobile engaging in activities such as travelling to school. It's at this point when those in the poorer neighbourhoods are most exposed to the risks of road traffic injury, and the consequences become most severe, setting families back into a cycle of poverty. With debt, the burden of care, and reduced chances to earn an income the ripple effects are a drain on wider communities.

Here we profile cases from low and middle income countries around the world covering Brazil, Mexico, Colombia, India, Indonesia and Thailand. These cases are representative of the effect that road traffic injury has on those that are striving to make a living, to become more self-sufficient, to support their families and improve

their circumstances. In this report we are focusing in on just a few testimonies, but they are representative of the pressures on countless more families in lower income communities and point to a much more widespread pattern of trauma and burden imposed by road traffic injury. The World Resources Institute (WRI) conducted interviews with victims of road traffic crashes in six countries in which they operate around the world. Their stories provide examples of the wide-ranging long-term impact that injuries have on affected families. They charted the impact of the crash on the family over time, asking those questions about the impact of the crash on the household's costs and expenditure. This initial survey work gives a snapshot of the effects of road traffic injury on lives and livelihoods in fast developing cities, and it also provides a strong indication that a far more substantive research agenda on this issue could be opened up.

Each family's story is unique and personal. The situations and challenges they face as a result of road traffic crashes have points of similarity, while also differing between contexts and countries. They illustrate how poverty affects the choices that households make and also expose them to higher risks of injury.

Key findings from six countries:

- Poverty means people are more likely to travel by the unsafe transport that is available to them and are therefore more vulnerable;
- And those on lower incomes are more likely to walk, with less protection provided by the road infrastructure, and less enforcement on the roads a feature of poorer neighbourhoods;
- When suffering a road traffic injury families face a double hit of costs and lost income;
- And beyond this face a severe debt burden;
- Often, a road injury victim will also suffer compromised treatments, with poorer quality healthcare available and failure to achieve a full recovery is commonplace;
- Families striving to improve their life-chances face severe setbacks as a result of road traffic injury, often entering a cycle of poverty;
- When either the child themselves directly suffers a road traffic injury or a family member is injured or killed education is often lost with attendance rates lower or a child drops out of school entirely;
- All this comes on top of the physical trauma and the profound emotional and social loss.

TABLE 1: ALL SIX COUNTRIES FACE SERIOUS CHALLENGES

	Road death rates (/100,000)	Motorcycles %	Pedestrians & cyclists %
COLOMBIA	16.8	44	34
BRAZIL	23.4	28	23
INDIA	16.6	33.9	12.6
INDONESIA	15.3	36	23
MEXICO	12.3	6	31.8
THAILAND	36.2	72.8	10.4



Tatiana and her 10-year-old daughter

CASE STUDY 1: Brazil

Sudden impact brings a lifetime of trauma

Sao Paulo's favela's and the surrounding road network offer little protection for the most vulnerable.

Tatiana da Silva lives in a run-down neighbourhood on the favela-lined outskirts of North West Sao Paulo. Tatiana lost her daughter, Lívia Mollo when she was visiting her husband in prison, along with her two daughters. The bus left them on Rodovia Dutra, one the busiest motorways in South-East Brazil, at a place with no pavement and no pedestrian crossing. Tatiana and her two daughters were hit by a driver who was arrested and found to have been drunk driving.

Tatiana and her 10 year-old daughter were injured suffering head injuries and broken bones. They survived but her youngest, five-year-old Livia, was killed. Tatiana had been working hard to make ends meet in a job as a driving instructor, but has been unable to return to work after the trauma and injuries she also suffered. She had been supporting the whole family but is now thrust further into poverty. She struggles every day emotionally and finds it hard to look after her children.

CASE STUDY 2: Colombia

A life turned upside down

Colombia's capital city Bogota sits high in the Andes, with many of its nearly 9 million inhabitants living in low-density suburbs which sprawl across the vast mountain plain. The city's road system is set out in an irregular grid, with rapid and unplanned development leading to uneven blocks, twisting streets, and diagonals cutting across the network. The large expanse of the city means that people travel long distances to get to work.

Milton is a father of three children; Joshua (aged 7), Devon (aged 6) and Jared (aged 2). One morning, in April 2014, Milton was travelling to work in Central Bogota as a construction worker on his motorcycle. However, that day his life turned upside down when he collided with a public bus which failed to stop at a red light. His story is typical of many people on low incomes, as he had chosen to use a motorcycle as it was cheaper and quicker than using public transport. A motorcycle would get him to work in 40 minutes, compared to over an hour by bus. In addition, it was around half the cost - \$2000 compared with \$4300 by bus. The crash resulted in him breaking his leg, and these injuries led to him having it amputated. He also suffered traumatic head injuries. In Colombia, 44% of road traffic deaths in 2013 were among motorcycles.

After the crash, he was off work for 8 months, but has since been able to go back to work in the construction industry with his same company. However, he is paid less than before as he can no longer manage heavy lifting or physical activity at heights. He is also fortunate that he lives in a country that provides support to people with disabilities, which means a regular payment that supplements his income.

The majority of the costs for Milton's healthcare were paid for by compulsory motor insurance, and he only had to pay for the costs of daily rehabilitation therapy. Even so, the crash has made a big impact on his family and pushed them towards poverty as Milton has lost nearly half his previous income. Even though his wife works, they can no longer afford the US\$30 monthly fee to send their children on the school bus, and his wife now walks with the children for 25 minutes to drop them at school. For the first 8 months after the crash, they also had to end their telephone and internet services as they could no longer afford the US\$25 fee.



Above: Olaf Chavez Salgado and his family
Below: Maria and Wendy Martinez



CASE STUDY 3: Mexico Sliding to poverty

The pressures and strain imposed by road traffic injury on poor families are apparent from cases in Mexico City. In June 2013, 18 year old Olaf Chavez Salgado and his wife were travelling together on a motorcycle when they were hit from behind by a car. Olaf fractured his tibia and fibula, while his wife suffered minor injuries. Olaf was hospitalised for 20 days, and has subsequently had to return to hospital 7 times as his body did not accept the reconstructive metal plate that was used to support his leg. As a result, he had to quit his job as a mechanic, and since then the whole family have been supported by his mother’s income.

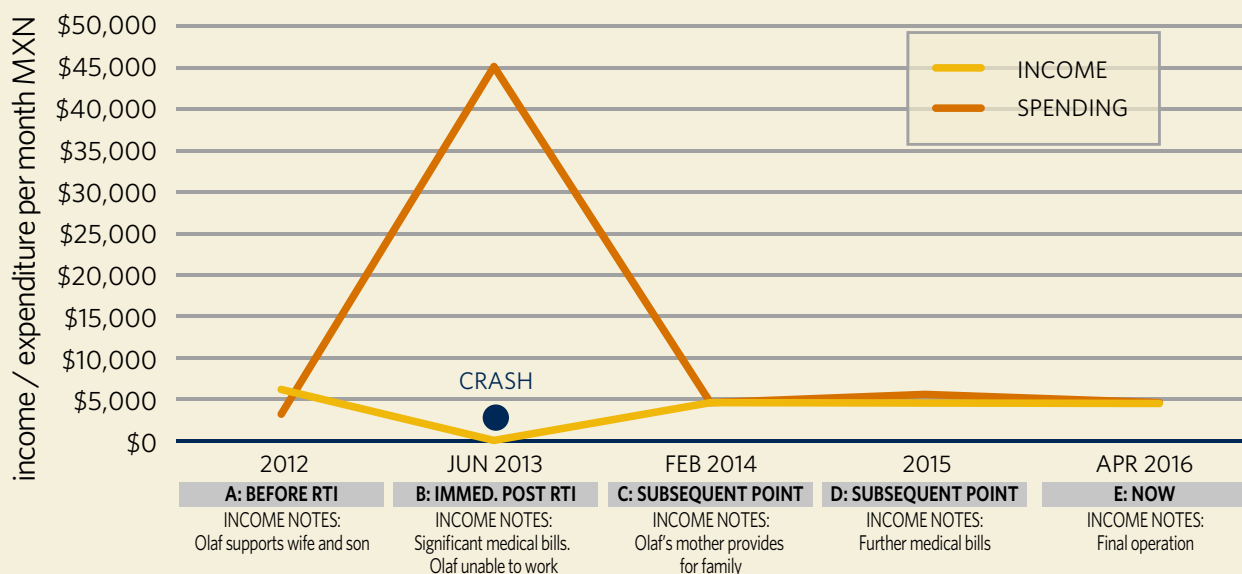
At one point Olaf’s mother had to leave her job in order to take care of him, but has subsequently been able to find other employment again. She remains the only source of income for the family, which includes Olaf’s wife, and their young son. Olaf continues to have operations to adjust his metal insertions in his foot and leg. Although he was not charged for the operations, they did charge for the metal inserts, which have cost over US\$2000. Although the family’s income now just covers their outgoings with his mother’s help, this injury has dramatically affected their financial situation and affected all of them, and they have had to rely on support from their extended family to pay for the medical costs.

CASE STUDY 4: Mexico An ongoing struggle

Maria Martinez, a single mother had been bringing up five children on her own, in cramped accommodation, struggling to pay the rent. While out on the streets of Mexico City, two of her children, Wendy and Adriana were hit by a drunk driver. Wendy can no longer walk and is carried - there is a long iron flight of stairs leading to the apartment which is now almost impossible to manage.

Bringing up the children on her own was enough of a struggle. She had taken on two jobs but given the time spent on hospital appointments after the injuries, she has lost one job and the other is in jeopardy. Maria is worried that she will no longer be able to afford rent and pay her bills since her daughters were hit. According to Maria, there is little enforcement of speeding or drink driving in the area where her children were hit. For Maria, the education of her children is everything and is a route from poverty. Her children have already missed school, and the worry is that they will not be able to fulfil their potential and get the qualifications for the jobs they aspire to. She says: “I will do everything I can for them to continue studying and have a good life. I tell them that they should see that I cannot read and write but that they must continue studying and I will do anything I can for them. Adrianna wants to be a teacher so she needs to carry on studying and I will help all I can with them and my other three children.”

FIGURE 5: TIMELINE - THE SALGADO FAMILY, MEXICO





The Kumar family



Guru Teg Bahadur Nagar slum, Delhi

CASE STUDY 5: India

Burdening India's poor

Fruit and vegetable seller Neeraj Kumar and his wife Soni lost their son Ronuk who was just 2 and a half years old. The parents were working and he was playing near their stall when a speeding car drove past, hit and killed him. Ronuk was already dead by the time his father had reached the trauma centre. Neeraj Kumar says: "Whenever I think about my son I can't bear it. It's difficult for us to live a life without our son." The Kumars know only too well that children in the slum areas of Guru Teg Bahadur Nagar in northern Delhi where they live are at risk of road traffic injury, and casualties are all too common. Cars regularly speed down the better paved but narrow lanes around the slum, with no separation from the thousands of young children who are often unsupervised. Both parents work, leaving in

the early hours of the morning, returning late at night each day. Earning just a few dollars a day, and under enormous financial pressure, the Kumars are often unable to look after their children. As far as his daughter is concerned, Neeraj Kumar is considering giving up on an urban future for her. He says: "I don't know what I will do. I don't know how I am capable of stopping these cars from speeding on roads. They cause air pollution, they cause deaths. I am planning to send my daughter back to my village because after my son's death, I don't know that keeping her here is safe." Families living in poverty and lacking capacity to supervise their children at particular risk of road traffic injury. According to testimony from Rucha Thakkar, District Coordinator for Save the Children in Delhi, such situations are common. In an assessment across 50 school sites in Delhi carried out by the Save the Children office, children reported as the major concern being "very scared" on the roads being often exposed to crashes and road traffic injury.

CASE STUDY 6: India

Arrested development

For the urban poor in India, the impact of road traffic injury is often multi-dimensional. In the bustling streets of Noida on the edge of Delhi, two brothers, Nand and Brij Kishore, were walking to work at their tea stall when they were hit by a motorcycle. The crash occurred while they were crossing a busy intersection near a U-turn where vehicles seem to approach from all directions. Both were injured, Nand was left with a fractured leg and needed to have a metal rod inserted. He was in hospital for a month.

This injury had a terrible impact on the family. The brothers, together with their wives, six children and sister and mother all live in the same small building, and together the \$200 or so that they earn a month from the tea stall supports this whole extended family. The injury meant that Nand was not able to work, causing a significant financial burden as the family relied on this income. The family had to borrow money to pay for the medical costs. These costs turned out to be more expensive than they had first thought – and the family ended up needing to pay over \$2000.

This had a huge impact on the 12 family members the brothers support and they have reported their financial losses at up to 50% of their income. They had to borrow 1.5 lakh rupees for the hospital bills. Total



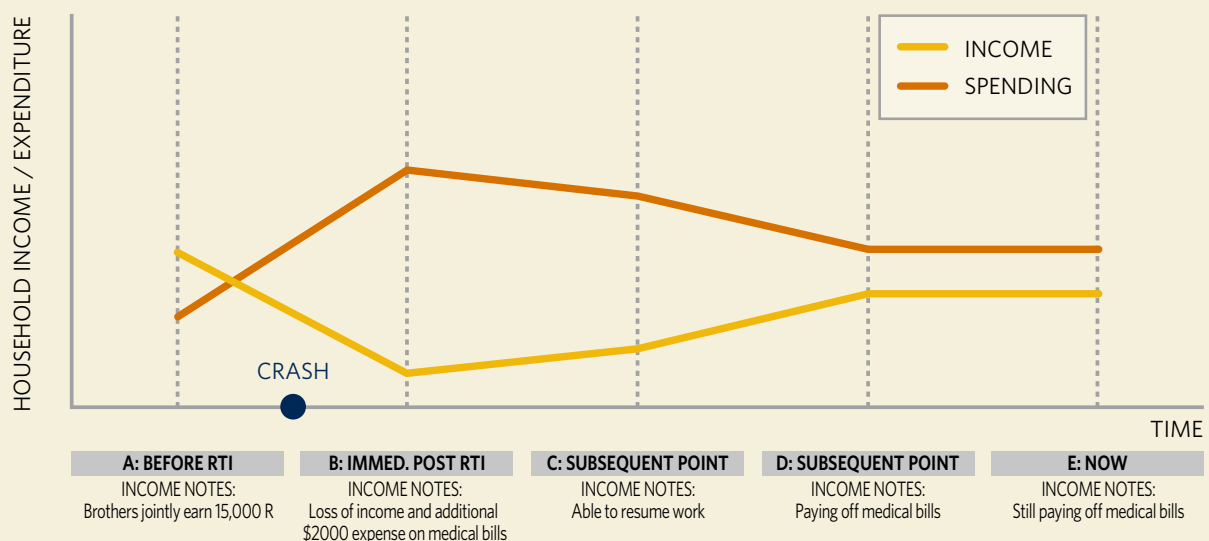
Road traffic injury had a big impact on brothers, Nand and Brij Kishore

household income is currently down to 15,000 rupees (\$227 a month).

As a result, the children had to drop out of school as the family could no longer afford to pay the school costs. They hope that the children will be able to return to school once the debts are paid. They say that this will hopefully be within a year, but unfortunately the income from selling tea is not very high, and the financial pressure on the family is causing a lot of anxiety as they struggle to pay off the debts, and the children miss out on education.

Being unable to attend school is common among the poorest, although this family had aspired to break out of this situation. The brothers are currently working to clear their debts following the injury, though this will take a while as their income is barely higher than subsistence.

FIGURE 6: TIMELINE - THE KISHORE FAMILY, INDIA



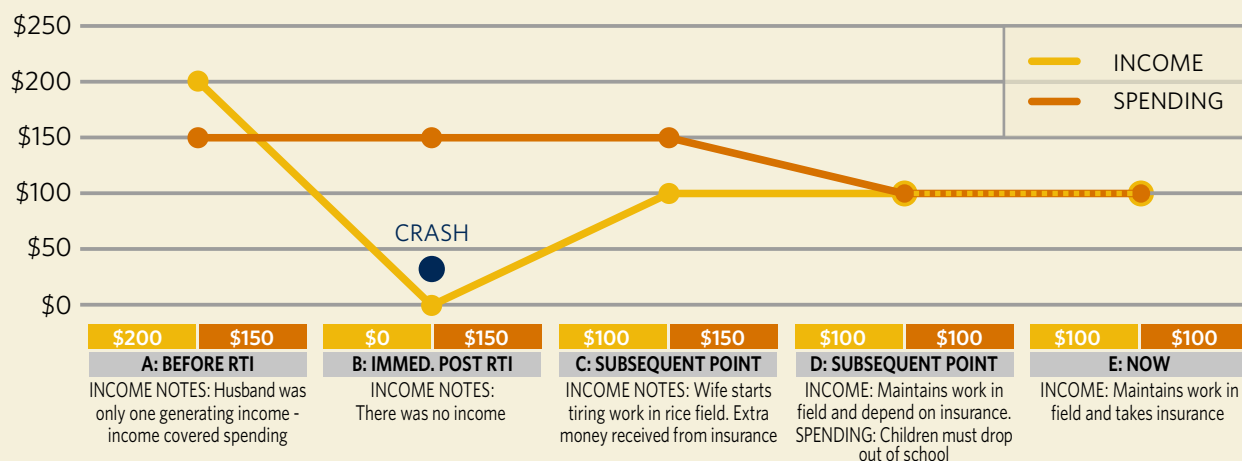
CASE STUDY 7: Indonesia

Loss of a breadwinner

Ngadirah lives in Kebumen on the Indonesian island of Java, a town close to the Indian Ocean. Her family's life was turned upside-down five years ago when her husband was killed in a road traffic collision. At the time he was the only person who provided financially for their family, earning around \$200 a month, while Ngadirah looked after their two children at home. One afternoon, her husband was riding his bicycle home after a day at work, when he was hit by a car. Sadly, despite the efforts of people to help him, he died by the time he

reached hospital. Since her husband's death, Ngadirah has worked and as a result is less able to look after the children, leaving so early in the morning that she doesn't even have time to cook them breakfast. Her two children eventually dropped out of school, as she could no longer afford to send them. They would like to go back to school in order to get a good job, but it isn't clear when or if they will be able to. Ngadirah estimates that before the crash, the family's income was around the average level in the community, but now they are among the poorest, earning around \$100 a month. They have significantly cut back on expenditure. While she received some money from insurance which cushioned the initial impact, the crash has shifted the family onto a poverty trajectory, missing out on education and barely making ends meet.

FIGURE 7: TIMELINE - NGADIRAH'S FAMILY, INDONESIA



CASE STUDY 8: Thailand

Danger on the streets

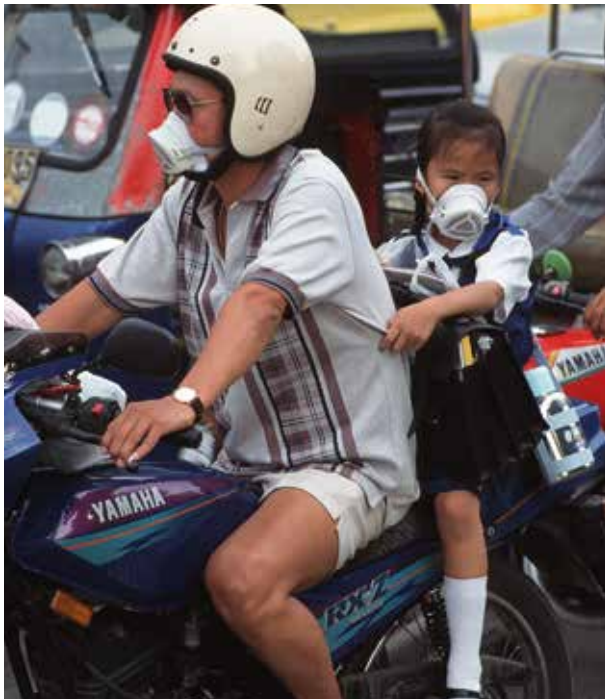
Chutikarn Meepai, aged 9, and her family are some of the poorest people in their community, and make a living selling lottery tickets in the local market in Nontaburi province, just north of Bangkok, Thailand. Both of her parents have disabilities - her father Kammoon only has one arm, and her mother, Kamonwan, has post-polio syndrome. The family could expect to sell around \$400 worth of tickets a month, giving a profit of just over \$200 once the cost of buying the tickets is included.

Recently, on the way back from the market in their three-wheeled motorbike, they were hit by a local

bus on the main road, around 1km from home. The bus wheel crashed into Chutikarn's leg, and left the little girl seriously injured. As a result she has had to have her leg amputated, and is still in hospital over a month later. Her parents are unable to earn money, as they have to look after their daughter, and so are relying on handouts from charities and government. Although the family receive free medical care through Thailand's Universal Medical Coverage, they still have to pay additional medical expenditures. Over the past month, these medical fees have cost over \$1000, and the family have also had to pay additional costs of renting somewhere to stay near the hospital, as well as travel costs. Chutikarn is likely to be hospitalised for a number more months, and the family faces tremendous challenges in looking after her and earning enough money to survive.



Top: Phattharaporn Thatong was injured in a truck crash
Bottom: Children are vulnerable in Bangkok's traffic



CASE STUDY 9: Thailand

The cost of injury

Phattharaporn Thathong and her husband, Wanchai Kumpha, live in Bangkok, Thailand. Her life was changed by a crash in January 2012, when she was run over by a truck. She was returning from a pregnancy check-up, travelling as a passenger of the motorbike which her husband was driving. They were driving along the four lane Phetkasem Road, when the motorcycle became sandwiched between two large 18-wheel trucks. The truck on the right side clipped the motorcycle, causing them to fall. Although her husband Wanchai only had minor injuries, Phattharaporn's left arm and leg were crushed by the other truck. The driver of the truck did not stop, and Phattharaporn was in hospital for three months. Fortunately, doctors were able to save her life, and that of her baby, but she had to have one arm and leg amputated.

Phattharaporn had just graduated from college, and was looking for a job, but has not been able to find one since her injury. Her 28-year old husband is a teacher, and had to take two weeks off work following the accident as well as additional time without pay to attend follow up appointments. They have had trouble getting to the hospital in a taxi that could accommodate her wheelchair, and incur significant additional costs just to travel around.

Wanchai has recently changed jobs to a new role near their home so he can be close to his family, but it means he has a lower salary than he had before. Their budget remains very tight, and they spend everything they earn. Their small daughter, Pattarawan, stays at home with her mum, but often remains in her bedroom all day until Wanchai comes home from work. As they live near a busy street, Phattharaporn continually fears her daughter will be hit by traffic if the child goes out alone.

Conclusion

Across low- and middle-income countries road traffic injury devastates families and communities. As we have seen, road traffic injury tends to hit at exactly the point at which children and their parents are aiming to improve their life chances – children struck down on the way to school, breadwinners hit while attempting to provide for their families. Those

who may have been succeeding in improving their economic situation are set back, often thrown into a cycle of poverty. This situation is repeated many millions of times throughout the developing world each year. Road traffic injury is an epidemic which causes untold misery, strangling and suffocating the poor, an unsustainable approach to development which destroys lives rather than promotes life chances. Yet it need not be this way.

AGENDA FOR ACTION



Solutions to protect the vulnerable

A range of proven solutions are readily available to address the growing issue of child road traffic injury, solutions which are entirely applicable for implementation in poor communities across low- and middle-income countries. While roads are often built and designed by public works or transport agencies in cities and countries, the issue cuts across many aspects of urban development, from housing ministries to national development plans. The solutions can be applied throughout urban planning, housing policies, transport and mobility plans and projects, guidelines for urban development and other significant policies, that shape the urban landscape.

Vehicle speed management should be at the heart of strategies to protect children, delivered through a 'safe system' approach of infrastructure and street re-design to provide a 'forgiving' environment. This can be buttressed by enforcement strategies, awareness raising and education of both drivers and children. But in the context of poor communities in low and middle-income countries, where consistent and effective police enforcement may be difficult to guarantee, providing traffic calming measures which force vehicles to slow down, combined with separated sidewalks and cycle-ways, and safe crossing points, is likely to be the most effective short-term approach.

Using speed policy to minimise the kinetic energy released in a road traffic collision is essential to providing a forgiving road environment. This is especially important in urban and peri-urban areas, where motorised vehicles move in close proximity to large numbers of pedestrians, cyclists and other vulnerable road users. However, analysis by the World Health Organization shows that only 47 countries (half of which are high-income), currently meet the legislative criteria for best practice on urban speed management – a national urban maximum speed limit of 50 km/h, and local authority powers to reduce this limit to ensure safe speeds.⁵⁷ As described elsewhere in this report, surveys by iRAP in developing countries show that more than 80% of roads with a speed limit of 40km/h or more where pedestrians are present do not have viable sidewalks. High vehicle speed combines with inadequate pedestrian facilities with appalling consequences.

A major report on urban health published by the World Health Organization and UN-Habitat, as a contribution to the Habitat III process defining a 'New Urban Agenda', emphasises how the 'safe system' can provide a strong policy framework for delivering lower speed limits,

separated cycle lanes, and improved pedestrian facilities in which policymakers recognise "that road users are fallible, crashes do occur and that it is up to road designers and planners to reduce crashes and mitigate their impact."⁵⁸ In the follow-up to the launch of the SDGs and ahead of Habitat III the UN General Assembly adopted a resolution which, "taking into account that the majority of road deaths and injuries take place in urban areas...", encouraged Habitat III negotiators "...to give appropriate consideration to road safety and access to safe, affordable, accessible and sustainable public transport and non-motorized modes of transport, paying special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons in the future New Urban Agenda."⁵⁹

Inspired by the safe system, a number of urban centres are taking the lead in implementing an approach which puts vulnerable road users at the top of the decision-making hierarchy. For example, in 2013 Sao Paulo Mayor Fernando Haddad introduced the Life Protection Program (PPV), which focuses on making roads safer for all users, with a focus on the most vulnerable. The city has introduced a series of changes, including citywide speed limit reductions, diagonal crossings, new cycle lanes and pedestrian-only zones. In addition to reducing speed limits on major arterial roads, the city has implemented eleven "Areas 40," which reduced the speed limited to 40 km/h (25 mph) on select streets in areas with high pedestrian and commercial activity.

As a result of these changes road deaths fell by 20.6 percent overall from 2014 to 2015, a saving of 257 lives. Cyclist deaths dropped by 34 percent, from 47 to 31, while the number of pedestrian deaths dropped 24.5 percent, from 555 to 419. Similarly, the number of driver deaths fell by 16.9 percent, from 207 to 172, and the number of motorcycle deaths fell 15.9 percent, from 440 to 370. The first of the 'Area 40s' to be implemented, "Centro", recorded 71 percent fewer road fatalities and injuries after the new speed limits were introduced.⁶⁰

In 2015 Mayor Miguel Mancera of Mexico City announced a new Vision Zero policy aiming to improve safety for pedestrians across the city, which experiences 1000 road traffic deaths a year. The introduction of this policy follows many years of advocacy by civil society organisations. Mexico City's Vision Zero establishes a range of road safety measures to protect and prioritise pedestrians and has an initial goal of reducing pedestrian deaths by 35%. Measures include reducing speeds on major roads, improving intersection design, and introducing traffic calming measures.⁶¹

While the strategies adopted by these cities are not specifically directed at children, they address system

weaknesses which do particularly affect the young and the poor. Many high-income cities which have adopted a safe system or 'vision zero' approach see child safety as a priority, and sometimes a starting point. In Sweden, originator of 'vision zero' the particular rights of children to be safe on the road underpin the whole philosophical approach (see box 3). Safe routes to school programmes, combining speed management, street redesign and traffic calming, focused enforcement and community awareness initiatives, are localised, micro, safe systems which are effective, widespread and popular. Adapting this approach in middle and low-income countries can do much to stem the tide of road traffic injury amongst children.

South Korea provides one of the best examples. It has managed to reduce child traffic injuries by 95% from 1,766 in 1988 to 83 in 2012 by taking a comprehensive approach combining safe routes to school, road safety legislation and education.⁶² Other measures included providing over 30,000 free car seats to families that might not otherwise afford them. Similar approaches have begun to demonstrate results for poor communities in low and middle income countries, but there is still much work to be done to bring them to scale, integrating them into systematic nation-wide policies. Below we highlight some of solutions that are being developed and success stories that have been achieved.

BOX 3:

A SAFE SYSTEM FOR CHILDREN

The 'safe system' is an approach to road safety which argues that system designers and managers have a responsibility to work to prevent any crashes resulting in serious death or injury. A safe system which has child rights at its heart can guide policy to make streets safe for children – and all road users – all across the world.

Expert reports, including the OECD's 'Keeping Children Safe in Traffic', published in 2004, the UNICEF/WHO 'World Report on Child Injury Prevention', and the OECD's 'Towards Zero: Ambitious Road Safety Targets and the Safe System Approach', both published in 2008, argue for specific targeted measures to improve child safety within a 'Safe System' approach to road safety policy that takes protection of the most vulnerable road user as its starting point and designs infrastructure, vehicles and the rules to provide a 'forgiving' road environment in which death and injury need not be the consequence of human error.

The moral case for a 'forgiving' road system is at its strongest when we consider children. Politically unenfranchised and at the mercy of events – whether it be as pedestrians trying to cross a high speed dual carriageway dividing their home from their school, as passengers travelling without seat belts on an unregulated bus steered by an untrained driver, or as cyclists fighting with trucks for a share of the road – children are entirely blameless victims of a system which, at its worst, not only routinely allows adults to kill or maim them, but sometimes seems to be designed in such a way as to facilitate death and injury.

It is in Sweden, where government, politicians and road authorities invented and pioneered the 'Safe System' or 'Vision Zero' approach, that practice has come closest to realising roads safe for children. Child road traffic deaths are below 1 per 100,000 population.

In 2012 only one child was killed, compared with 58 in 1970. For pedestrians, more than 12,000 safer crossings have been introduced; while 1,500 kilometres of highway are now "2+1" roads, where infrastructure design prevents head-on collisions. Tough speed limits, combined with strict enforcement and sustained awareness raising, have reduced the risk of crashes and the severity of collisions when they do occur. As Sweden's experience shows, a philosophy which views investment in safety as a social responsibility can result in low rates of injury for all.⁶³ As cities like Sao Paulo are showing, the safe system approach can be adopted anywhere where there exists the political will to make the change.

Engineering the safe system

The introduction of safe infrastructure has proved to be effective in all settings including low and middle income countries, and can provide a ‘quick win’ in improving safety for all road users including pedestrians and children. The International Road Assessment Programme (iRAP) has identified a range of cost-effective infrastructure solutions for protecting pedestrians and

vulnerable road users on all forms of road network including in neighbourhoods and on routes to school. Infrastructure improvements to tackle speeding around schools include adequate street crossings, traffic signals, bicycle lanes, signage, speed humps, road markings, and pedestrian fencing, sidewalks, and speed reduction programmes. The introduction of such countermeasures raises the safety level, or ‘star rating’ of a road. iRAP calculates that for each star rating improvement, road traffic fatalities decrease by half.⁶⁴

BOX 4:

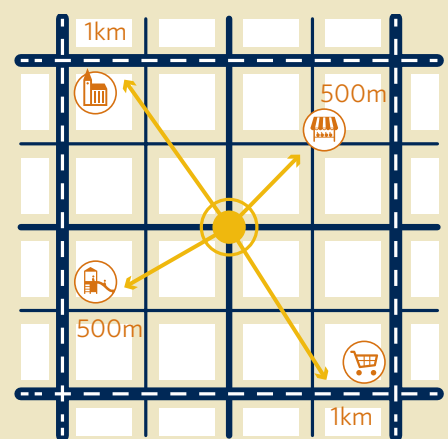
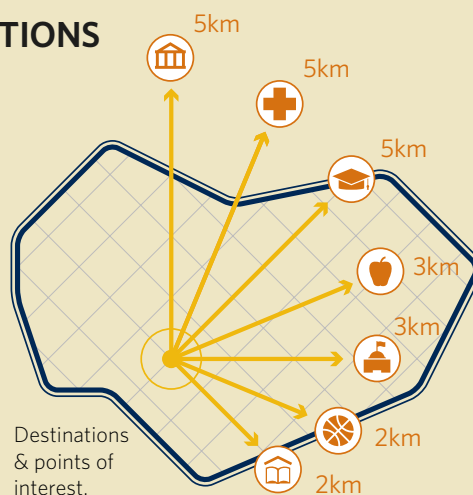
DESIGN PRINCIPLES FOR PEDESTRIAN SAFETY

With the poor particularly exposed as pedestrians to road traffic injury, urban design prioritising pedestrian safety is critical.^{65, 66, 67} Urban design has proved successful in reducing levels of pedestrian road traffic injury including in fast developing urban centres. Effective design principles include: minimising vehicle travel lane width to prioritise pedestrians; providing sidewalks on both sides of the streets where possible; providing appropriate width for building and land use function; minimum street widths needed to support all road users.

Evidence from Mexico City shows that as the maximum pedestrian crossing distance at an intersection increases by 1 metre, the frequency of pedestrian crashes increases by up to 3 percent.⁶⁸ Each additional lane (another measure of street width) also increases crashes at all severity levels.⁶⁹ The most significant relationship to injury crashes was found to be street width and street curvature. As street width widens, crashes per mile per year increase exponentially. The safest residential street width is 7.5 metres.⁷⁰

ACCESS TO DESTINATIONS

Pedestrian destinations or points of interest are normally places that people find useful or interesting or where employment, retail, and leisure uses concentrate. High-quality networks should be provided particularly between key destinations such as residential areas, schools, shopping areas, bus stops, stations, and places of work.



WRI. 2015. Cities Safer By Design, p26

- Neighborhoods should be designed to include transit, parks, schools, stores, and other uses within walking distance, considering a 5km catchment area for these activities
- Complement with safe pedestrian and bicycle routes to nearby destinations such as schools, parks, and retail.
- Provide residential densities that support local facilities within basic walking distance.

BOX 5:

SOLUTIONS SAVING LIVES: SCHOOL ROUTES IN SOUTH AFRICA



In pilot project work conducted with iRAP in Khayelitsha, South Africa, the introduction of a safe crossing for one school was calculated to reduce the risk of road traffic injury for school children by 85%. The project is an example of how infrastructure can be implemented effectively in a very low income community to improve protection. Khayelitsha is one of South Africa's most disadvantaged townships.

The project in Khayelitsha has brought safe crossings and road infrastructure to the route to school combined with an education toolkit to low income communities at high risk of road traffic injury.

At one of the project schools, Sivile Primary, children face traffic travelling at 90 km/h as they cross the dangerous Jeff Masemola Highway on their daily journey to classes. Sivile was selected because of the high exposure of children to danger on the roads to school. Before the

introduction of the Safe Schools initiative, a high level of road traffic injury was reported with over 15% of the children indicating they had suffered from road injury, and the vast majority reporting they wanted action to be taken to be kept safe on the roads. A 'conflict analysis' assessing the level of risk to the children crossing the Jeff Masemola Highway has been carried out by the project team working at Sivile. This analysis identified instances where children crossing to school were placed in danger by vehicles travelling at speed. During the peak hours on the daily journey to and from school there were 39 recorded 'conflicts' - instances of children placed in danger from oncoming traffic while crossing the highway.

Just half an hour from the school is the Red Cross Children's hospital, the only dedicated children's hospital in Southern Africa. The hospital's trauma wards have a large intake of road traffic casualties, with 90% from the Western Cape region. In the year to December 2014, the hospital received 1,138 road traffic injuries - three per day. A strong coalition of civil society, local agencies and international donors including principally corporate donor Janssen Pharmaceuticals and the Road Safety Fund together with expertise from the International Road Assessment Programme (iRAP), was formed to support a pilot project to protect children on the route to school.

The 'Safe Schools' model combines the introduction of safe road infrastructure on the route to school - safe crossings on the high speed roads, with a training package for teachers and a road safety curriculum for the children which has been researched and designed by Sesame Workshop's South African team, Takalini Sesame, to reflect local conditions. The project has so far leveraged €86,000 investment in safer infrastructure around the pilot schools from the Cape Town local authority. Implementing engineering solutions would need to be founded on an assessment of risk present on the existing road networks. Tools such as conflict analysis, casualty reports from schools, iRAP's risk mapping road assessments, and crash data could be used to estimate the scale of the problem and plan for infrastructural improvement to ensure safety of children. Infrastructural investments around schools, also ensures benefits to the entire community.

BOX 6:

SOLUTIONS SAVING LIVES: AMEND'S SARSAI PROGRAMME

Targeting schools with high levels of child injury, with between 1%-4% of children being injured on the roads each year, Amend is implementing 'School Area Road Safety Assessments and Improvements' (SARSAI) programmes.

The initiative involves a systematic assessment of areas around schools, identification of measures that will improve road safety, and the implementation of those measures through action by the NGO and delivery from the local authority.

Amend's school area interventions take place in countries with little reliable road traffic injury data. So countermeasures are designed through a review of the behaviour of children, of drivers and other road users, and household surveys of injury rates and patterns. Appropriate specific measures to improve safety are identified, based on the assessment.

Some of these measures can be relatively low cost infrastructure improvements (speed bumps, bollards, sidewalks, signage, new school gates, etc.) as well as the introduction of community-based measures such as crossing patrols, and community and school road safety education.

The SARSAI neighbourhoods are typically poor, the schools overcrowded, and the roads and streets around them not planned for large numbers of children and fast moving traffic to co-exist. Sidewalks are often lacking, crossings non-existent. As always with safe school zones, speed management of vehicles is the most important element: reduce the speed to within a safe envelope and most serious injuries can be prevented. So if SARSAI provides zebra crossings, it flanks them with speed bumps or other traffic calming measures. Some solutions can be simple: at one site knocking through the back wall of the school compound to make a new gate allowed many children a shorter and safer walk, avoiding the main road.

Engaging local community leaders and city authorities is vital for the delivery and sustainability of the programme. Speed management requires police support and understanding, removing obstacles from sidewalks (like temporary vendors or parked vehicles) needs backing from local leaders. Above all, securing the participation and ownership for SARSAI by the community – teachers and parents – and their political representatives is the first step to a programmatic approach to safety which protects and extends short term gains. This is a particularly important objective aiming at scaling-up the interventions to build sustained government programmes and to encourage the introduction of stronger speed legislation and enforcement. Amend is currently conducting an impact evaluation of SARSAI with the US Centers for Disease Control and Prevention and researchers from the Johns Hopkins School of Public Health.



Speed management

Alongside and in tandem with engineering solutions, speed enforcement is a vital component of strategies to reduce road traffic injury and protect children. Lower speeds around schools and neighbourhoods reduce crash frequency and ensure a lower risk of road traffic injury for pedestrians.

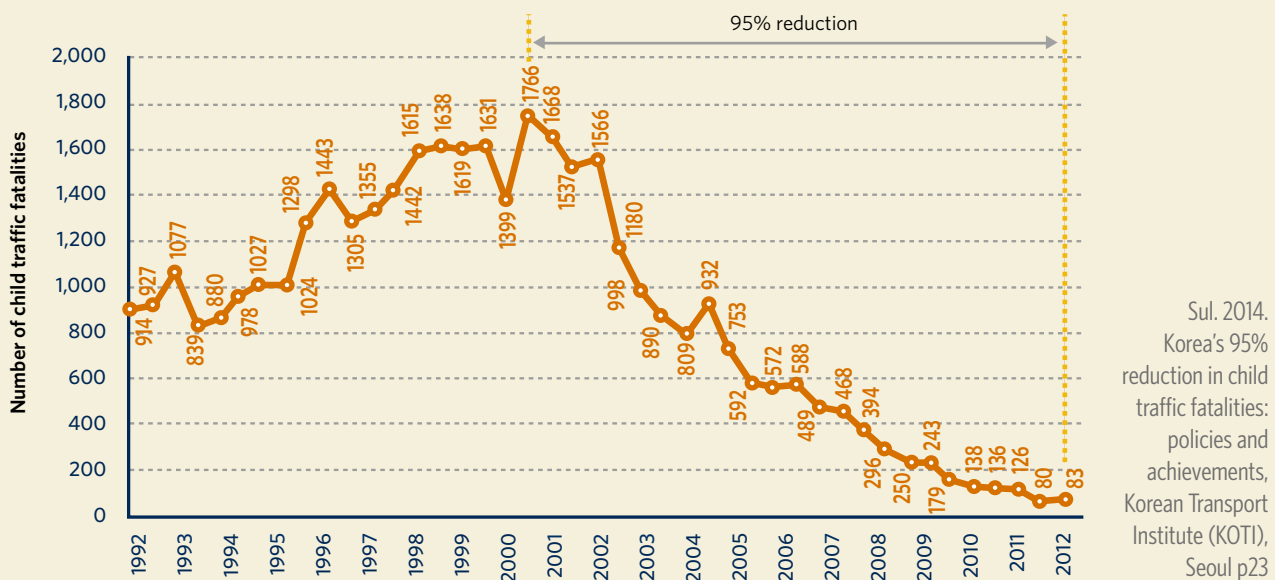
Lower vehicle speeds, especially those below 35 km/hr, have been found to drastically lessen the risk of fatalities.⁷¹ Creating safer streets when cars are present means balancing the inherent tension between vehicle speeds and the safety of pedestrians, cyclists, and motor vehicle occupants alike.⁷² A range of tools can be used effectively to introduce speed management, including: enforcing a maximum speed limit on roads with high concentrations of pedestrians; time-based lower speed limits when students travel en route to school and back; and enforcing speed limits through the use of automatic speed cameras. In the most effective approaches, enforcement works in tandem with design and infrastructure measures.

Low speed zones in urban settings also result in improved quality of life and community benefits, and encourage healthier and more sustainable transport modes such as walking and cycling. Speed enforcement also tends to lend itself to greater public acceptance when focused on schools and neighbourhoods, and is

therefore an effective approach to implementing road safety when taking into account political influences on decision making. Speed enforcement strategies are likely to be effective: when implemented in large scale over a sustained period of time; when clearly communicated to the public; and when they have effective detection systems to track violations and penalties in place. The approach is entirely applicable to the developing country context – in Ghana for example, the introduction of speed control measures on the Accra–Kumasi highway reduced crashes by 35% and fatalities by 55%.⁷³ Data collected over a two year period indicated that the ‘speed factor’ alone accounted for more than 50% of all Ghanaian road traffic crashes. In this Ghanaian initiative, engineering was also an important component with traffic calming measures such as rumble strips a major contributor to the successful intervention.⁷⁴

In the context of the road safety epidemic afflicting middle and low-income countries, South Korea’s success in implementing speed management policies is informative. The reported results demonstrate what can be achieved if programmes are evidence-based and taken to scale. The country has managed to achieve, between 1988 and 2012, a remarkable 95% reduction in road traffic fatalities for children under the age of 14 by introducing and investing in programmes to improve school zones, improving the regulation and safe operation of school buses, supporting civil society organisations in advocating for road safety, providing education and improving laws.

FIGURE 8: KOREA'S REDUCTION IN CHILD TRAFFIC FATALITIES 1992-2012



BOX 7:

SOLUTIONS SAVING LIVES: SPEED MANAGEMENT IN KENYA

With funding from Bloomberg Philanthropies, Global Road Safety Partnership (GRSP), and the World Health Organisation (WHO), in partnership with government ministries worked on speed management strategies in Kenya. Their work has helped to pave the way for a pending legislation that mandates reducing speed limits around schools to 30km/h. Focused on two sites, Thika and Naivasha, the project implemented speed reduction strategies including traffic calming, enforcement training for more than 1,300 police officers, and advertising campaigns which saw speed compliance rise from below 50% to more than 70%.

Bloomberg Philanthropies estimate that more than 100,000 children have been given greater protection as a result of the speed reduction and other measures of the project. According to testimony from project sites in Thika, the speed management measures have reduced incidents of road traffic injury for children attending local schools and attendance at school has increased postintervention. Supported by Bloomberg Philanthropies, work has been underway to advocate for an amendment to the national Traffic Law traffic law limiting speed around all schools to below 30km/h and improving safety standards of school transport.



One feature of the Korean experience is the concentrated focus on school journeys. Since 1995, with the introduction of 'school zones' which designated safe areas around kindergartens and primary schools, the government has introduced laws on school bus safety, mandatory prosecution of drivers involved in crashes within school areas, a doubling of fines for traffic violations occurring within school areas, and compulsory road safety education. As the number of road fatalities has been reduced, new fatality reduction targets have maintained ambition, and in 2014 the latest legislative changes were introduced to clamp down on unregistered school transport.

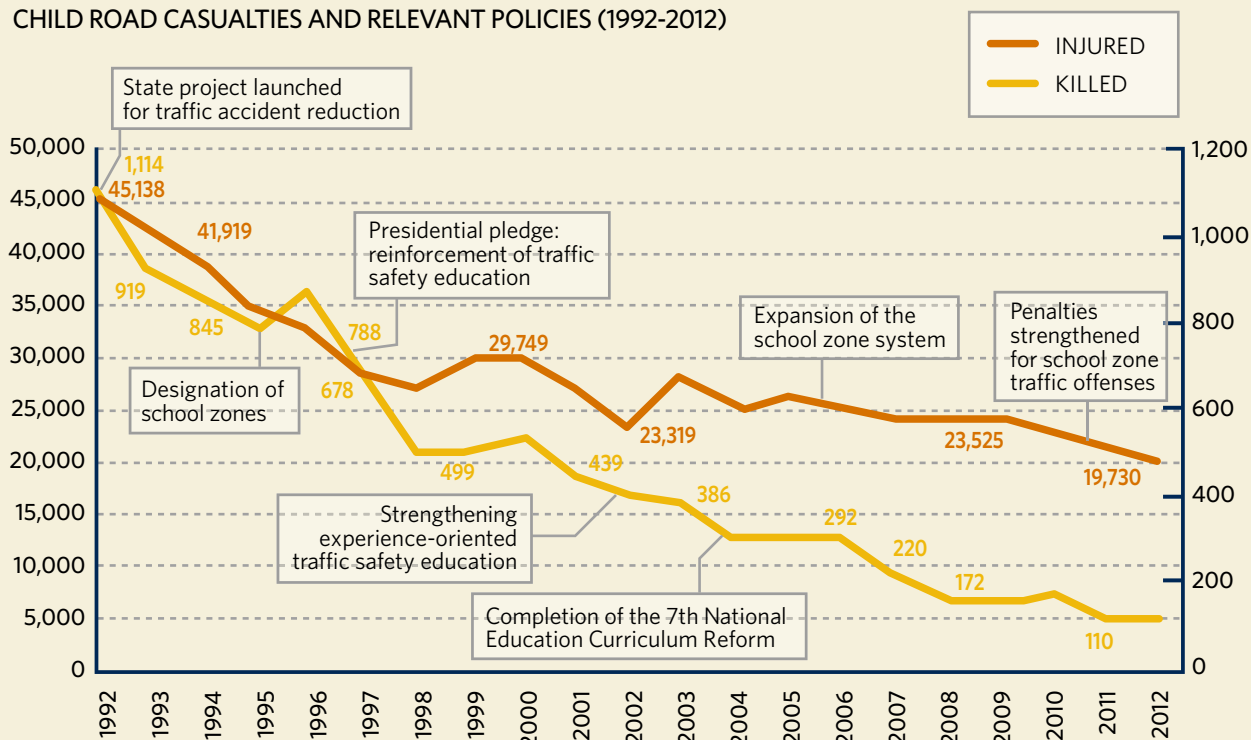
South Korea introduced and refined legislation and enforcement over a sustained period. Enforcement was closely integrated with the other key elements of the policy framework, and part of an overall holistic drive to design a safe road system. The introduction of unmanned enforcement cameras was an effective initial intervention, which was followed over a number of years with initiatives such as crackdowns on drink driving, and doubling the level of fines for speeding

in school zones. With strong monitoring and data collection, the authorities have demonstrated the effectiveness of these sustained interventions.

Education has also been an important component of South Korea's programme, although it has not been introduced in isolation but as part of an integrated package. The government requires the kindergarten curriculum to include 40 hours of traffic safety education annually, while older children have 20 hours. The country has even set up a network of road safety demonstration parks for children to learn how to stay safe.⁷⁵ However, while education is important, it needs to play a role alongside the other key elements of speed management and the safe system approach, as while it may improve knowledge and behaviour, there is less evidence that it leads to injury reductions.⁷⁶ Evaluation of road safety education in high income countries have concluded that effectiveness is at best short term, but repeated exposure to the safety messages, as well as introducing education to younger children who may have yet to fully develop attitudes towards road safety may be more beneficial.⁷⁷

FIGURE 9: KOREA'S SUSTAINED POLICY COMMITMENT TO SPEED MANAGEMENT

CHILD ROAD CASUALTIES AND RELEVANT POLICIES (1992-2012)



Sul. 2014. Korea's 95% reduction in child traffic fatalities: policies and achievements, Korean Transport Institute (KOTI), Seoul p84

BOX 8:

SDG POLICY PRIORITIES FOR EVERY CHILD

A 'children first' agenda for the SDGs must promote practical policies ensuring a safe system to protect the poor and vulnerable.

- **Ensure safe routes to school for all children**, with walkable pavements, safe crossings, and effective vehicle speed management;



- **Ensure safe travel to school.** Seatbelts and safety checks for school buses, seat belts or appropriate child restraints in cars, helmets for motorcycle passengers;



- **Improve safety for all road users on high risk roads**, meeting at least 3 star (out of 5) safety performance as measured by the International Road Assessment Programme;



- **Prioritise pedestrians and cyclists in urban planning**, increasing investments in safe infrastructure for non-motorised transport to encourage active, low carbon, mobility;



- **Deploy and encourage pedestrian-friendly vehicle design and safety technologies**, such as Autonomous Emergency Braking, which can mitigate or even stop a crash;



- **Encourage policies to reduce vehicle emissions and improve air quality** such as reducing sulphur levels in fuel (below 50ppm); particulate filters on vehicles; and improved vehicle fuel economy in line with GFEI targets.

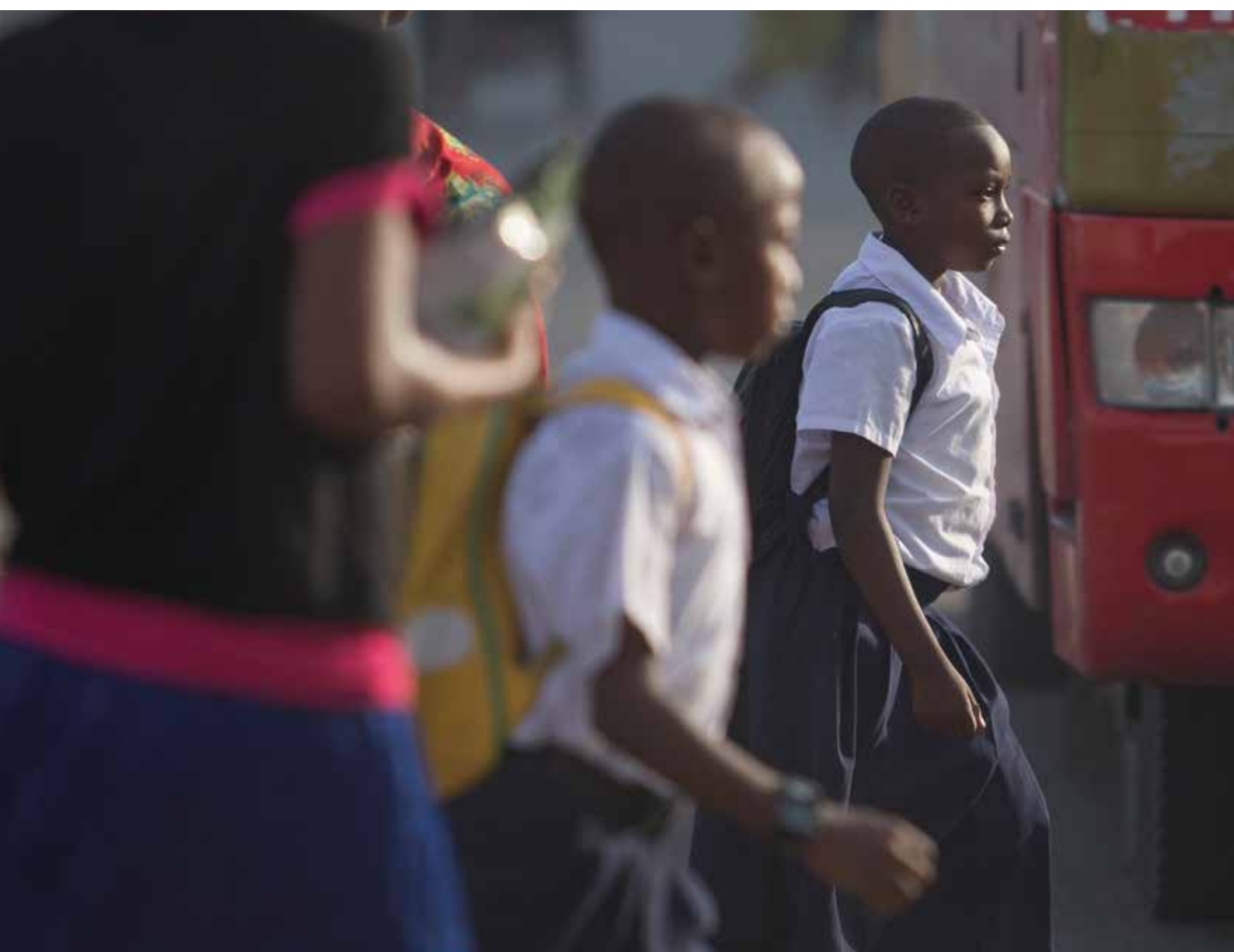


Conclusion

Countries like South Korea and cities like Sao Paulo are demonstrating that with sustained commitment, dramatic results are possible. Combining infrastructure solutions with speed enforcement has proven effective in a focused policy framework which places child welfare and protection at the centre. This is an approach which has the protection of the vulnerable as a central concern. It is one which applies equally to low- and middle-income countries and is one which is desperately needed by those living in poverty. The cases

where a safe system is being implemented to protect the poor and vulnerable in developing countries remain an exception. The general absence of a safe system, the neglect of proven and readily available solutions for the poorest and most vulnerable leads to untold human suffering on a vast scale. As we have seen, examples and initiatives exist, but are isolated and seldom scaled up. The widespread failure to integrate safe system approaches into mainstream transportation and development policy jeopardises both the specific road safety objectives of the new Sustainable Development Goals and their overall mission to eradicate poverty and address inequality.

CONCLUSION: A SAFE JOURNEY FOR EVERY CHILD



CONCLUSION: A SAFE JOURNEY FOR EVERY CHILD

The SDGs core aim to eradicate poverty is an ambitious task requiring a herculean global effort. But if progress is to be made, issues which cross-cut and link with poverty must be addressed. Road traffic injury is one such issue. A man-made epidemic and a product of an unsafe environment it is emblematic of the cyclical relationship between poverty and public health impacts.

Poverty and road traffic injury are deeply entwined. As we have seen, families living in poverty are exposed to an environment fraught with danger and highly vulnerable to road traffic injury. The poor are subjected to an unsafe, unjust system. They typically live in close proximity to, and travel on dangerous roads. As pedestrians, the basic safety measures afforded to more affluent communities are absent and they are forced to walk without protection at the mercy of high speed traffic. When they do use vehicles, these tend to be dangerous and overcrowded. Basic poverty and the absence of public policies to safeguard the poor combine, compounding human suffering. As in the case of Dar es Salaam's 'bodaboda' motorcycle crisis, unsafe vehicles, subject to little or no regulation, proliferate on the worst roads near densely populated slums and informal settlements. That there is an injury epidemic should be of little surprise. Children in particular bear an intolerable burden imposed on them from many different angles. Whether it is directly, suffering road traffic injury just as they seek to become more independent and mobile including on the way to or from school; or indirectly when a parent or family member is struck down. In the worst cases their lives are shattered, and too often they are denied an education.

Families aspiring to improve their life chances, struggling to work their way out of poverty, striving to ensure their children attain an education, are often those most at risk. They are heavily impacted, unable to afford adequate medical care, suffering lengthy aftereffects, burdened by debt and denied education, employment and life-chances that they had been so keenly striving for. Too often they are trapped in a cycle of poverty and further

ill health, and too often there is no escape. Across low- and middle-income countries, this is repeated many millions of times each year. And as the number one killer of children over 10 years old, this amounts to a crisis for sustainable development and threatens the core anti-poverty agenda of the SDGs.

Yet this crisis is preventable with effective integration of road traffic injury in the SDG agenda. Such an approach would make an important contribution to achieve not just the road safety related targets of the SDGs but the core anti-poverty agenda of the Goals as a whole. The scope of this report has allowed a review of existing material on poverty and road traffic injury and a brief investigation of case study material across a range of countries. However, policy makers need to have a far greater awareness of road traffic injury's poverty burden and its bearing on the core concern of the SDGs. For this, further research to advance advocacy is required, giving visibility to the consequences of failing to address road traffic injury, which serves to exacerbate poverty, jeopardising economic development.

Of critical importance, policy makers also need to have a greater understanding of the need for 'safe system' solutions in all contexts, and particularly their applicability and efficacy in lower income settings. As Governments develop national SDG plans to reduce child poverty and its impacts, strategies to reduce road traffic injury particularly in disadvantaged communities should be included. And global support is needed for effective policy making and delivery on this agenda. International agencies focused on implementation of the road safety SDG targets must recognise the impact of road traffic injury on poverty as they design the framework and public policy package to achieve this agenda. The wider development community must also respond, promoting proven road safety interventions as strategies to combat poverty. The aim must be to spur and support focused action by national governments and public authorities at all levels.

BOX 9:

A NEW SDG PARTNERSHIP FOR CHILDREN



GLOBAL INITIATIVE FOR
CHILD HEALTH
AND MOBILITY

With at least 500 children killed every day on the world's roads, thousands more injured in road traffic crashes and millions suffering from chronic respiratory illness or stunting as a result of air pollution, a significant proportion of which can be attributed to motor vehicles, there is a clear need to make safe and sustainable mobility a priority policy issue. The Global Initiative for Child Health & Mobility is a partnership including founding members UNICEF, UNEP, Save the Children, Overseas Development Institute, the World Resources Institute and the FIA Foundation which is working to support three key rights of the child, consistent with the UN Convention on the Rights of the Child:

- Safe, accessible, low-carbon mobility to promote equity and combat poverty
- Clean air and a healthy environment;
- The role of safe and healthy mobility in enabling the right to an education.

This practical partnership for the Sustainable Development Goals is focusing on global advocacy; research and evidence building through demonstration programme implementation; and support to countries and cities through technical assistance and catalysing national action coalitions. The Initiative's work includes supporting national and regional partners showcased in this report – such as Amend and the International Road Assessment Programme – in securing policy change and financing to scale up proven road traffic injury interventions. The key objective is to promote the vision that by 2030 every child should enjoy a safe and healthy journey to school, free from traffic danger or harmful air pollution.

Components of the initiative include a partnership between UNICEF and the FIA Foundation to build road safety capacity and support for legislative change through UNICEF country offices in South America and South East Asia. Save the Children will also provide advocacy support. The World Resources Institute is focusing on assisting cities with urban design change to enable safe walking and cycling; while UNEP will work with countries



to provide similar active mobility technical assistance, as well as undertaking air quality research and interventions. ODI is undertaking a two year research study on the political economy of implementing sustainable mobility change, which will include recommendations for specific cities.

CONCLUSION: A SAFE JOURNEY FOR EVERY CHILD



New SDG orientated partnerships such as the Global Initiative for Child Health and Mobility have a vital role to play in this regard. This initiative, convened by the FIA Foundation, brings major child focused international agencies together with development experts to combine research, advocacy and evidence-based interventions to promote safe and sustainable mobility as a priority for child rights in the SDGs.

At its core is a global SDG policy objective focusing on a safe and healthy journey to and from school for every child, leaving no-one behind. This agenda can and must be integrated into the development community's objectives on combating poverty and addressing inequity. Key UN agencies such as UNICEF and UNEP have already joined forces as founder partners to advance research, advocacy and the programmatic response. Along with UNICEF, Save the Children has joined the initiative to promote this issue as a priority for child rights. The Overseas Development Institute is contributing global development expertise and

the World Resources Institute brings best practice in sustainable mobility solutions, the 'safer by design' approach. With technical support and the capability for practical implementation, from a wide range of delivery partners, this partnership is poised and ready to make a difference. We encourage new partners and additional donors to get involved.

This child rights agenda has been invisible for too long. We need a paradigm shift. The current approach to transportation and planning policies which neglects the poor and overlooks children, the most vulnerable in society, must change urgently. A policy approach which accepts an unsafe environment for the poorest and allows poor families to be so heavily burdened by road traffic injury is surely unacceptable. The SDG framework gives us a once in a generation opportunity to achieve a transformational shift. For a sustainable future, for the sake of millions of lives and livelihoods, and for the sake of every child, we must take this opportunity, we cannot fail.

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ABBREVIATIONS

Global Road Safety Partnership (GRSP)

Gross Domestic Product (GDP)

International Road Assessment Programme (iRAP)

Road Traffic Injury (RTI)

Sao Paulo's road safety Life Protection Program (PPV)

School Area Road Safety Assessments and Improvements (SARSAI)

Sustainable Development Goals (SDGs)

United Nations Children's Fund (UNICEF, originally United Nations International Children's Emergency Fund)

World Health Organization (WHO)

World Resources Institute (WRI)

UNICEF

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