



Pedestrian accidents and road safety education in selected developing countries

by I A Sayer and A J Downing

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by I A Sayer and A J Downing

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EXECUTIVE SUMMARY

This report describes the results of surveys that were carried out as the initial phase of a research programme which aims to achieve a long-term reduction in developing country child pedestrian accidents and casualties. It is considered that this can be achieved by improving the understanding of the problem and by improving teachers' and children's road safety knowledge, behaviour and attitudes through educational means researched in developing countries themselves.

Pedestrians are a particularly vulnerable group of road users in developing countries and their exposure to risk is high. In part this is due to the high proportion of journeys made on foot, a lack of footpath facilities, especially in rural areas, and poor road user behaviour and knowledge.

The road accident data from Botswana, Papua New Guinea, Pakistan and Zimbabwe, showed that 30 to 50 per cent of recorded fatal accidents were pedestrians. Pedestrians under 16 years old formed about one-quarter of those killed.

In Zimbabwe, over 75 per cent of the pedestrians killed were crossing the road. Of the pedestrians injured whilst walking along a road, 70 per cent were injured when walking with their back to the traffic.

The world-wide survey of Ministries of Education showed that road safety was a mandatory subject in 50 and 55 per

cent of developing and developed countries respectively. Over twice as many Ministries in developed (29 per cent) as in developing countries (11 per cent) stated that road safety should be taught as a separate subject as opposed to including it with a co-subject such as Social Science.

Although young people were among the high at risk group in Pakistan (29 per cent), less than 25 per cent of schools in Karachi provided road safety lessons. About 50 per cent of the schools surveyed in Zimbabwe and Botswana taught road safety.

A lack of resources and poor teacher knowledge of teaching road safety were perceived as main problems to teaching road safety. About 50 per cent of schools stated that increased teacher training was a very important need.

Schools in Zimbabwe and Botswana attached more importance to teaching 'How to cross roads safely' (64 to 80 per cent), 'Safe places to cross' (57 to 67 per cent), and 'Safe places to play' (27 to 79 per cent). 'Dangers of parked cars' (0 to 24 per cent) and 'People who can help children to cross roads' (21 to 30 per cent), were less frequently taught.

The study forms part of TRL's Overseas Resource Centre's ongoing research programme into road safety in developing countries and was funded by the British Overseas Development Administration.

PEDESTRIAN ACCIDENTS AND ROAD SAFETY EDUCATION IN SELECTED DEVELOPING COUNTRIES

ABSTRACT

This report describes the results of surveys that were carried out as the initial phase of a research programme which aims to improve pedestrian road safety education and reduce pedestrian accidents in Third World countries.

The study includes replies from questionnaires distributed to Ministries of Education throughout the world and to schools in Botswana, Pakistan and Zimbabwe. The report also shows road accident data from Zimbabwe, Botswana, Papua New Guinea (PNG) and Pakistan (Karachi and Islamabad).

Pedestrian casualties accounted for 50 per cent of the total injured in Karachi, 35 per cent in Zimbabwe, 29 per cent in Botswana and 33 per cent in Papua New Guinea (PNG). Of the pedestrian casualties killed in PNG, 36 per cent were less than 15 years old. The percentages of pedestrian casualties less than 15 years old who were killed in Karachi and Botswana were 29 and 26 per cent respectively.

In Zimbabwe a sample of pedestrian casualties showed that 70 per cent were injured when walking along a road with their back to the traffic. The main journey purpose of adult pedestrians injured in Zimbabwe was walking from work to home. Twelve per cent of casualties less than 15 years old were injured on a school journey. Nine per cent of these were injured on the homeward trip.

Worldwide, 43 Ministries of Education replied to a questionnaire on traffic education. In both the developed and developing countries there was a tendency for road safety to be a mandatory subject in the junior rather than the senior schools.

Most Ministries recommended that road safety should be taught as part of another subject. In developing countries, Social Studies was the most frequently mentioned subject.

The main priority for improving road safety education in developing countries was 'New curriculum materials'. In developed countries, the main priority was 'Increased teacher training'.

About 50 per cent of the 1580 schools questioned claimed to have taught road safety. In Islamabad (26 per cent) and Zimbabwe (34 per cent), traffic safety instruction was left to the discretion of individual teachers. Road safety demonstrations and practices were carried out in about 50 per cent of schools in Zimbabwe.

About 10 per cent of schools in Pakistan conducted demonstrations and held practices in a playground. Material help was generally sought as posters and films.

Outside specialists were used to teach road safety in 28 per cent of schools in Botswana.

Police visited about 5 per cent of the schools surveyed in Pakistan and 8 per cent in Zimbabwe and Botswana. In all three countries, the parent's role in teaching road safety in schools was negligible.

In Zimbabwe (about 60 per cent), Botswana (54 per cent) and Pakistan (30 per cent) a lack of finance and shortage of materials were cited as main reasons for not teaching road safety.

Less than 5 per cent of any of the schools surveyed had provided cycle training for pupils.

1. INTRODUCTION

Studies, in developing countries (Jacobs and Sayer, 1983; Jacobs and Sayer, 1984; Sayer and Hitchcock, 1984; Downing, 1991; Downing et al, 1993) have shown that pedestrians are a high risk group of road-users representing a significant proportion of all reported road accident casualties. For example, in African countries, more than 40 per cent of road accident fatalities were pedestrians. In Middle Eastern countries it was more than 50 per cent. By comparison, in Europe and the United States of America (USA) pedestrians represented about 20 per cent of road accident fatalities. The higher involvement of pedestrians in developing country accidents may have been simply due to more people making walking trips. However, there is some evidence (Jacobs and Sayer, 1984), showing that, when pedestrian and vehicle flows were taken into account, pedestrians were more at risk in Third World cities than they were in UK cities.

The above studies by Downing (1991 and 1993) also showed that approximately 20 per cent of fatal road accidents in Third World countries involved young people under the age of 15 years. In European countries and the USA it was 10 per cent. On average, children in Africa represented more than a quarter of all pedestrian road accident deaths. However, as the proportion of the population aged less than 16 is approximately double that of developed countries, these statistics do not necessarily mean that children are more at risk in developing countries. Nevertheless, children in Third World countries clearly

represent a serious road accident problem requiring priority attention.

Research has shown (Downing et al, 1993) that both pedestrian and driver behaviour and knowledge can be poor in developing countries. Road user education improvements would seem to have good potential for accident and injury reduction.

Although there have been numerous studies investigating the effectiveness of road safety teaching methods and materials in developed countries, the transferability of their findings to developing countries is uncertain. Therefore, TRL has proposed a two-stage process aimed at improving the approach to road safety education in developing countries. The first stage is studying accident patterns, education practices, resources and needs for teaching road safety. The second is the development of road safety education materials for teaching road safety in primary schools.

This report describes the results of the first stage of this research and development programme. It compares:

1. pedestrian accident statistics in Botswana, Pakistan Papua New Guinea (PNG) and Zimbabwe
2. results from road safety education questionnaires sent to Ministries of Education throughout the world
3. results from road safety education questionnaires distributed to primary schools in Botswana, Pakistan and Zimbabwe.

2. SURVEYS CARRIED OUT, METHODOLOGY AND SAMPLES SIZES

2.1 ROAD ACCIDENTS

TRL's Microcomputer Accident Analysis Programme, MAAP, (Hills and Elliot 1991), was used to analyse road accident data from Botswana (1991), Pakistan (1991), Papua New Guinea (1990) and Zimbabwe (1990).

The accident data was obtained from standard police accident reports with information on 728 pedestrian casualties in Botswana, 586 in (Karachi) Pakistan, 533 in PNG and 2,868 in Zimbabwe. The Pakistan records were restricted to Karachi. These were the only comprehensive accident data computerised in that country. Other data came from specially prepared pedestrian accident forms filled in by the police collecting extra information on pedestrian movements, journey purpose and each accident site in Papua New Guinea, Botswana and Zimbabwe. Sample sizes in each country were 46, 58, and 564 respectively.

2.2 MINISTRIES OF EDUCATION

A postal questionnaire was distributed to Ministries of Education worldwide determining what recommendations, advice or instructions had been issued to schools about road safety education.

Questionnaires were sent to 93 Ministries of Education in developed and developing countries. Countries not replying within two months of the initial request were sent additional information about the research programme and another copy of the questionnaire. Forty-three (46 per cent) countries replied: this included Canada where returns from eight provinces were received. Thus, 50 questionnaires in total were received. Of the 43 countries replying, 15 (35 per cent) were developed country replies and 28 (65 per cent) were developing country replies.

2.3 ROAD SAFETY PRACTICE IN DEVELOPING COUNTRY SCHOOLS

A questionnaire survey of road safety education practice was conducted in a cross section of schools in Botswana, Pakistan and Zimbabwe. These countries were selected because they had relatively good road accident data collection systems and well-established collaborating arrangements for joint research with TRL. All three countries regarded road accidents as a serious problem and had road safety organisations interested in participating in the study.

Structured in a similar way to the Ministry of Education questionnaire, a questionnaire distributed to teachers was designed to obtain details about teachers' views on teaching methods, priority topics, resources available, outside support, time spent on road safety topics, problems encountered and improvements needed. Also, included were questions on training for cyclists.

To ensure that the questionnaire would cover essential topics adequately without making it long, pilot studies were carried out in all three countries.

The method of distributing the questionnaire varied. In Pakistan, where there was no organisation to coordinate a nationwide survey, only schools in Karachi and Islamabad, the capital city of Pakistan, were contacted. Delivery was by hired motor cycle riders who also had the responsibility of collecting the completed forms. In Karachi 1700 Primary and Secondary schools were listed by the government and about 450 (26 per cent) randomly selected schools were sent questionnaires. Four hundred and forty-five forms were returned for analysis.

In Islamabad the questionnaires were delivered and collected by hired couriers to the 200 schools in the Islamabad area. One hundred and twenty-one questionnaires (60 per cent) were returned.

In Botswana, the questionnaire was distributed to and collected from 132 randomly selected schools throughout the country by the office of the Principal Curriculum Development Officer.

In Zimbabwe, questionnaires were sent to about 800 randomly selected schools. Three hundred and eighty-three schools (48 per cent) replied. The distribution and collection were coordinated by the Zimbabwe Traffic Safety Board.

3. RESULTS

3.1 PEDESTRIAN ROAD ACCIDENTS

3.1.1 The magnitude of the problem

Table 1 shows that pedestrians were a particularly vulnerable group, representing 50 per cent of the road users killed in Karachi, 35 per cent in Zimbabwe, 33 per cent in PNG and 29 per cent in Botswana. There were differences between countries, notably the high proportions of deaths to pickup occupants in Botswana (31 per cent) and PNG (35 per cent) and of two wheeler riders in Karachi (27 per cent). These differences reflecting the national traffic patterns and users of these vehicles.

From Figure 1 it can be seen that between 12 and 17 per cent of the reported pedestrian casualties in Botswana, PNG and Zimbabwe died. This was considerably higher than in Karachi where 47 per cent died.

3.1.2 The nature of pedestrian accidents

Table 2 shows the main characteristics of pedestrian fatalities for the four countries as provided by 'standard' police

accident report forms. The six main findings were as follows.

1. Pedestrian fatalities were predominately male in all five countries, with Karachi having the highest proportion.
2. With the exception of PNG (44 per cent), most pedestrians were killed when crossing roads. A low percentage (4 per cent), of pedestrians in Karachi were killed while walking in the road. This statistic probably reflects the fact that only data available for this part of the study was 'urban' where more raised pavement facilities were available for pedestrians than for data sets covering both urban and rural areas.
3. The percentage of pedestrians killed under the ages of 16 years ranged between 22 per cent in Zimbabwe to 36 per cent in PNG. Botswana and Karachi had similar percentages of young pedestrians killed, 26 and 29 per cent respectively.
4. Most pedestrian fatalities were the result of accidents with commercial or public transport type vehicles (Botswana 61 per cent, Karachi 78 per cent, PNG 85 per cent). In Zimbabwe the percentage was slightly lower, at 47 per cent.
5. The percentage of pedestrians killed on all roads at night was greater in Zimbabwe (42 per cent), than the other three countries. The proportion of pedestrians fatally injured on unlit roads was similar in Botswana (27 per cent), PNG (21 per cent) and Zimbabwe (30 per cent). Much fewer pedestrians (9 per cent), were killed on unlit roads in Karachi than the other centres: again, this is likely to be due to the urban nature of the data set.

TABLE 1

Class of road accident fatality

Class of road user	Botswana	Karachi	PNG	Zimbabwe
	Per cent of fatalities			
Pedestrian	29	50	33	35
Car	22	1	7	20
H G V	9	8	15	17
Bus/pt	3	8	4	7
Motorcycle	1	17	2	3
Pick up	31	4	35	NA
Pedal cycle	2	10	0	5
Other	3	2	4	13
Per cent	100	100	100	100
Sample size	311	559	284	980

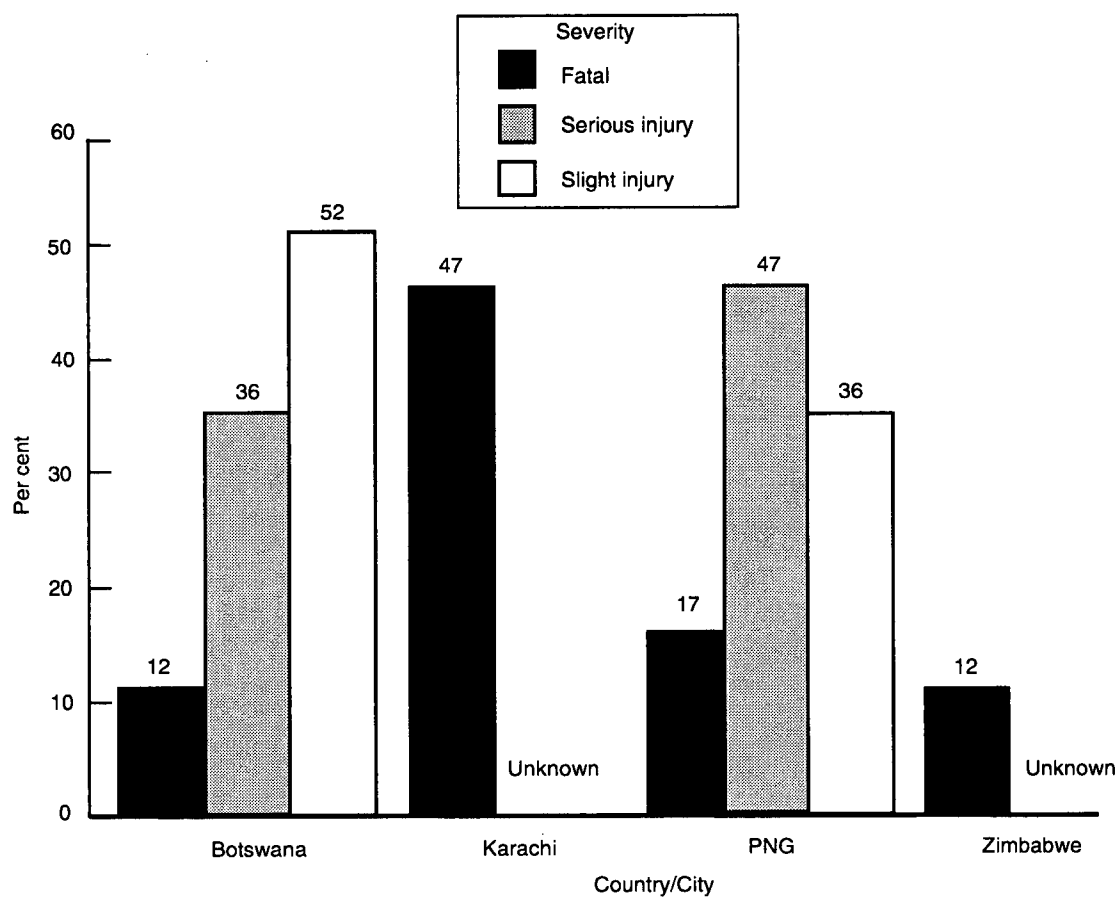


Fig. 1 Percentage of pedestrian casualties killed, seriously injured and slightly injured, 1991.

TABLE 2

Main characteristics of pedestrian fatalities

Countries/city Sample size	Botswana 109	Karachi 279	PNG 94	Zimbabwe 72
	Per cent			
Pedestrian fatalities that were:				
Male	63	84	66	72
Crossing the road	68	72	44	78
Walking in the road	10	4	36	16
less than 16 yr old	26	29	36	16
Injured by truck, van, bus or mini bus	61	78	85	47
In darkness, all roads	31	28	29	42
In darkness, unlit roads	27	9	21	30
Rural	64	NA	59	51
Away from junctions	74	87	82	91

6. Three-quarters of all pedestrians were fatally injured 'away from junctions'. For Botswana, Karachi, Zimbabwe and PNG, percentages were 74, 87, 82 and 91 per cent respectively. This is likely to be due to generally higher vehicle speeds prior to these accidents compared with those occurring in the vicinity of a road junction.

Pedestrian fatality data from the specially prepared forms are shown in Tables 3 and 4. No data were available for Pakistan. The five key findings were:

1. Most pedestrians were killed while walking along roads without paved footpaths. This was particularly true for Botswana, where nearly two-thirds of the fatal accidents occurred on a road without a footpath or shoulder. In Zimbabwe, about 25 per cent of pedestrians were fatally injured on roads with a footpath.
2. It can be seen from Table 3 that of the pedestrians injured whilst walking along a road, that in both PNG and Zimbabwe about 70 per cent were injured when walking with their back to the traffic.

3. In PNG, pedestrians were more likely (47 per cent) to be involved in an accident less than 100 m from home than in the other two countries e.g. Botswana 22 per cent, Zimbabwe 17 per cent. In all three countries, more than half of the fatal child pedestrian accidents were within 400 m of their home (Botswana 69 per cent, PNG 71 per cent and Zimbabwe 57 per cent).

4. The pattern of accidents in relation to whether or not children were accompanied at the time of the accident was markedly different in each country. In Zimbabwe, the majority of accidents occurred when children were on their own (39 per cent), or with other children (40 per cent). In Botswana, most casualties were with other children at the time (79 per cent). In PNG an alarmingly high proportion (38 per cent) were with adults at the time of the fatal accident.
5. There was a tendency for more accidents to occur on the way home (43 per cent compared with 31 per cent). For adults, the most common trip purposes were related to work (25 per cent), or shopping (25 per cent) whereas for children shopping (30 per cent) and school (12 per cent), trip featured most

TABLE 3

Characteristics of pedestrian accidents

Countries	Botswana		PNG Per cent		Zimbabwe	
Casualties who were						
Sample size	58		46		564	
<i>Walking along a road with:</i>						
No footpath or shoulder	64		31		43	
Grass/dirt shoulder	13		50		31	
Paved footpath	13		14		24	
Other	11		6		2	
<i>Walking along a road: sample size</i>	-		16		54	
Facing traffic	NA		32		30	
With back to traffic	NA		68		70	
<i>Run over:</i>	All	<15 yr	All	<15 yrs	All	<15 yrs
Within 100 m of home	22	46	47	56	17	43
Between 101 and 400m of home	22	23	15	15	10	14
Between 401 and 1 km of home	20	15	16	11	19	19
More than 1 km from home	36	15	22	19	54	24
<i>Children</i>						
Unaccompanied	7		23		29	
With other children	79		38		40	
With adults	14		38		21	

TABLE 4

Pedestrian casualties and journey purpose

Casualties	All	Adults	Children
Casualties walking from home to:			
Work number	45	45	0
(per cent)	(9)	(11)	(0)
Shops	64	51	13
	(13)	(13)	(13)
Club/bar	24	20	4
	(5)	(5)	(4)
School/college	7	4	3
	(1)	(1)	(3)
Other	13	8	5
	(3)	(8)	(5)
Casualties walking to home from:			
Work number	56	55	1
(per cent)	(11)	(14)	(1)
Shops	67	50	17
	(13)	(12)	(16)
Club/bar	16	14	2
	(3)	(3)	(2)
School/college	12	3	9
	(2)	(1)	(9)
Other	71	57	14
	(14)	(14)	(13)

frequently. The percentage of 'other' trips was quite high particularly for children (34 per cent). This trip category included 'playing in the road', 'no special purpose', and 'purpose unknown'.

3.2 ROAD SAFETY EDUCATION RESULTS

As described in sections 2.2 and 2.3, two questionnaires were distributed, one to Ministries of Education world wide, and another to schools in Botswana, Pakistan and Zimbabwe.

3.2.1 The provision of road safety education

Results from the Ministry of Education questionnaire (see Table 5), showed that 77 per cent of developed countries included road safety in their national curriculum compared with 64 per cent in developing countries. It was mandatory in 55 and 50 per cent of developed and developing countries respectively. It should be noted that these and the other results in this section of the report may not be completely representative as countries replying to the questionnaire may be those with a particular interest in road safety education.

Road Safety Guidelines were issued by government departments in 36 per cent of the developed countries. For the developing countries it was 29 per cent. In developing countries, road safety education was combined with Social Science (72 per cent), more often than the other topics shown in Table 5. In developed countries, Health Education was the most frequently (47 per cent), used partner subject. About three times as many developed countries taught road safety as a separate subject as did developing countries (see Table 5).

About one half the schools surveyed in Islamabad, Botswana and Zimbabwe had taught road safety during the previous year of the survey. In Karachi, only 23 per cent of schools had done so, (see Table 6). However, a higher percentage (20 per cent), of schools in Karachi had taught road safety using a specialist teacher. In Islamabad, the capital city of Pakistan, only 2 per cent of schools had used a specialist teacher to teach road safety.

In Botswana and Zimbabwe the schools reported that road safety was generally taught as part of Social Studies, reflecting the Ministry of Education questionnaire returns. In Pakistan, the largest percentage of schools surveyed taught road safety in Assembly (see Table 6).

TABLE 5

Ministry questionnaire: the provision of road safety education in primary schools

Countries Sample size	Developing 28	Developed 22
	Per cent	
Road safety in the national curriculum	64	77
<i>Road safety teaching:</i>		
Mandatory	50	55
Optional	27	21
Not known	23	24
<i>Road safety education guidelines:</i>		
Issued by government only	29	36
Issued by government and other bodies	36	55
<i>Road safety combined with:</i>		
Social studies	72	35
Health education	56	47
Other subjects	33	24
Taught as a separate subject*	11	29

* Sample size 18 17

TABLE 6

School questionnaire: provision of road safety education

Countries/cities	Botswana	Islamabad	Karachi	Zimbabwe
	Per cent*			
Number of schools	132	121	445	363
Taught road safety the previous year	46	51	23	52
Taught road safety at least once in the previous term	39	5	9	75
Used a specialist teacher for road safety	10	2	20	7
Number of schools	61	62	101	200
Road safety taught in:				
Social studies	44	16	18	90
Health education	21	12	11	30
Other subjects	15	2	1	19
Special project	8	0	2	14
In assembly	21	32	19	47
Separate subject	8	2	10	8
Left to discretion of teachers	31	18	16	34

* Schools could choose more than one option

3.2.2 Road safety topics taught

From Table 7, it can be seen that crossing roads safety was taught to Grades 1 - 3 in more than 75 per cent of schools in Botswana and Zimbabwe. In Pakistan schools attached more importance to teaching 'Safe places to walk' (Karachi 43 per cent, Islamabad 48 per cent).

In all three countries, importance was also attached to teaching 'Where to play safely' and 'Safe places to cross'. With the exception of Zimbabwe (Grade 4 - 5, 42 per cent), few schools taught the 'Dangers of parked cars'. Only eight per cent of schools in Islamabad (Grades 4 - 5), taught 'Road safety vocabulary'. Few schools in Pakistan taught 'Seeing and being seen' but two-thirds (Grade 4 - 5) of schools in the sample from Botswana and Zimbabwe did teach this (see Table 6).

In Zimbabwe, 74 per cent of sample schools in urban areas taught 'Safe places to cross', whereas less than 60 per cent of rural schools did. Similarly, with 'People who can help children to cross'. Forty-eight per cent of urban schools taught this with only 30 per cent of the rural schools so doing (see Table 7).

Table 8 shows a selection of the main topics taught by schools from Zimbabwe and Botswana.

In Zimbabwe 74 per cent of the sample of urban schools taught 'Safe places to cross' whereas less than 60 per cent of the rural schools did so. Similarly with 'People who can help children to cross'. Forty-eight per cent of urban schools taught this with only 30 per cent of the rural schools doing so.

Table 8 suggests that road safety was a more important topic in the rural schools of Botswana than it was in the urban schools. For example, 24 per cent of the rural schools sampled, taught about 'Dangers of parked cars' but in the urban area schools none did. Similarly, for 'How to summons emergency help', 15 per cent of the rural schools taught this but none of the urban schools did so.

'Where and how to play safely' was taught in more rural schools (67 per cent) than urban schools (29 per cent). Appropriately, 'Controlling animals on roads' was taught in 37 per cent of the rural schools and in only 7 per cent of the sample of urban schools (see Table 8).

TABLE 7

School questionnaire: road safety topic taught by grade

Countries/cities	Botswana		Islamabad		Karachi		Zimbabwe	
Sample size	61		62		101		200	
Grades	1-3	4-5	1-3	4-5	1-3	4-5	1-3	4-5
Topic taught	Per cent							
How to cross roads safely	77	79	42	23	39	27	83	90
Safe places to walk	67	67	48	16	43	28	78	85
Where and how to play safely	57	61	32	19	34	23	71	67
Safe places to cross	66	74	32	19	37	29	64	80
Traffic signs and signals	44	71	36	21	29	18	46	84
Using buses and other vehicles safely	34	49	21	12	19	14	45	66
Types and causes of road accidents	38	52	8	3	8	11	35	76
Seeing and being seen especially at night	41	67	8	2	5	9	27	65
Local roads and their problems	43	51	18	7	12	13	38	61
Traffic safety vocabulary	25	34	13	8	18	15	34	57
People who can help children to cross safely	26	43	24	12	23	16	30	44
Problems of controlling animals on roads	30	44	10	3	9	11	21	54
Dangers of parked vehicles	18	28	13	10	13	14	18	42
First aid	12	38	21	11	17	17	8	59

TABLE 8

Differences between topics taught in urban and rural schools

Topic taught	Per cent of schools	
	Urban	Rural
<i>Zimbabwe</i>		
How to cross roads safely	83	83
Where and how to play safely	79	68
Types and causes of road accidents	39	34
Controlling animals on roads	22	21
Dangers of parked cars	17	19
Safe places to cross	74	59
How to summons emergency help	9	12
People who can help children to cross	48	30
Sample size	125	23
<i>Botswana</i>		
How to cross roads safely	64	80
Where and how to play safely	29	67
Types and causes of road accidents	21	43
Controlling animals on roads	7	37
Dangers of parked cars	0	24
Safe places to cross	57	67
How to summons emergency help	0	15
People who can help children to cross	21	28
Sample size	46	14

3.2.3 Methods of teaching road safety

More (65 per cent) developed country Ministries of Education suggested that road safety was taught in the classroom than developing country Ministries (59 per cent - see Table 9). Developing countries were also reported to make more use of playgrounds (50 per cent) than developed countries (16 per cent). A similar percentage of Ministries (10 - 12 per cent) said that schools in their countries used the roadside for teaching road safety. Nearly 25 per cent of developing

country Ministries stated that schools used video/posters. Only 16 per cent of developed country Ministries stated that schools used video/posters (see Table 9).

Results from schools (see Table 10), show that inside classrooms, 'Talking' was the main road safety teaching method. 'Writing' was a principle means of instruction in schools in Zimbabwe (72 per cent). In Islamabad only 2 per cent of schools (Grades 4 - 5), used 'Writing' for instruction. 'Drama and role playing' were used in more

TABLE 9

Ministry questionnaire: methods of teaching road safety

Method used by all or most schools' Countries Sample size	Developing 26*	Developed 22
	Per cent	
Classroom	59	65
Playground	50	16
Roadside	10	12
Traffic garden	5	4
Videos/posters	23	16
Police visits	9	27
Visits other	10	8

* replies could include more than one option

TABLE 10

School questionnaire: methods used to teach road safety

Countries/cities	Botswana		Islamabad		Karachi		Zimbabwe	
Sample size	61		62		101		200	
Grades	1-3	4-5	1-3	4-5	1-3	4-5	1-3	4-5
Teaching method	Per cent							
<i>Inside classrooms</i>								
Talking	78	80	60	32	46	26	88	90
Writing	24	48	15	2	7	7	35	72
Drama/role playing	18	28	11	3	9	7	36	54
Song/rhymes	16	18	7	2	9	7	35	29
Road simulation	7	12	2	0	5	6	27	51
Models	10	10	5	0	1	2	20	24
Competitions/quizzes	3	15	5	3	5	6	10	34
Special projects	10	13	7	0	3	5	9	3
<i>Outside classrooms</i>								
Demonstration/practice in playground	30	23	13	12	10	7	51	61
Practice on roads	16	15	5	5	1	5	44	52
Visits to traffic gardens	3	3	0	0	1	2	5	4
Other visits e.g. Police station	10	13	0	0	1	2	2	7

than 50 per cent of schools surveyed in Zimbabwe but less so in Botswana and Pakistan, 3 - 36 per cent.

Instruction outside classrooms was mainly carried out in the form of demonstrations (Zimbabwe, 61 per cent, Grades 4 - 5), and 'Practice on roads' instruction (Zimbabwe, 52 per cent, Grades 4 - 5). None of the schools sampled in Islamabad made visits to 'Police Stations' or 'Traffic Gardens' (see Table 10).

3.3.4 Teaching materials and aids

In Botswana, 'Posters/charts' and 'Pupil's Road Safety books' were the main materials and aids used for teaching road safety (see Table 11). Few (2 per cent Grade 1 - 3), used 'Model road layouts and vehicles'. In Zimbabwe, 'Model road layouts and vehicles', were used by 16 - 20 per cent of schools questioned. Grades 4 - 5 in Islamabad schools may be poorly supported with teaching materials (see Table 11).

TABLE 11

School questionnaire: safety teaching materials and aids

Countries/cities	Botswana		Islamabad		Karachi		Zimbabwe	
Sample size	61		62		101		200	
Grades	1-3	4-5	1-3	4-5	1-3	4-5	1-3	4-5
Teaching aid	Per cent							
Posters and charts	36	54	14	2	19	16	54	74
Teacher's guides	28	36	2	2	6	53	33	43
Work/activity cards designed by school	7	12	0	4	24	4	24	32
Model roads and vehicles	5	2	3	0	2	5	16	20
Pupil's road safety books	39	48	2	0	8	2	10	17
Films, videos, slides	7	7	3	3	1	1	10	12
TV or radio programmes	8	18	5	5	3	5	2	6
Flannel graphs	2	2	0	6	2	3	4	7

3.3.5 Problems encountered and desired improvements

About 20 per cent of schools surveyed showed that 'Insufficient time/overcrowded time table' to be a 'Very serious' problem in the teaching of road safety (see Table 12). Other 'Very serious' problems were 'Lack of resources and finance' (28 per cent in Karachi, to 61 per cent in Zimbabwe), and 'Difficulty in obtaining traffic safety education materials' (26 per cent in Karachi, 63 per cent in Zimbabwe). 'Available materials were no good' was a serious problem in about 30 per cent of school (see Table 12).

'Classroom overcrowding' was 'Not a serious problem' in most schools (see Table 12). Also 'Not a serious problem' in 80 to 90 per cent of schools, was a 'Lack of teacher interest'. Staff with 'Lack of traffic safety knowledge' was a 'Very serious' problem in 48 per cent of schools surveyed in Botswana and about 20 per cent of schools in Pakistan and Zimbabwe.

Eighty-five per cent of schools in Botswana, 84 per cent in Zimbabwe and 60 per cent in Islamabad listed 'New teaching/learning aids, posters and films' as being the main 'Very useful' improvement. In Karachi, priority was given to 'New teachers' guides' (see Table 13).

Two-thirds of the schools surveyed in Zimbabwe, rated 'Increased provision of outside experts' as 'Very useful'. Table 13 also shows that 'Very important' for schools in

Zimbabwe was 'Advise on planning courses/syllabus' (51 per cent).

'Teachers courses at school' was 'Very important' for 74 per cent of schools in Botswana, 57 per cent of schools in schools from Islamabad and 62 per cent of the schools from Zimbabwe. Except for the schools in Karachi (27 per cent), courses for teachers, whether on or off school premises, was judged 'Very useful' by schools in Zimbabwe (60 per cent) and Botswana (74 per cent). About 30 and 50 per cent of schools in Karachi and Islamabad respectively, rated courses for teachers as 'Very useful' (see Table 13).

4. SUMMARY AND CONCLUSIONS

This study was the first phase of a planned research programme into achieving a long-term reduction in child pedestrian accidents and casualties in developing countries by improving the understanding of the problem and improved educational means.

Data from Zimbabwe, PNG, Botswana and Pakistan showed that 30 - 50 per cent of recorded fatal road accidents were pedestrians. Pedestrians under the age of 15 years formed more than 25 per cent of those killed.

TABLE 12

School questionnaire: severity of problems

Countries/cities Sample size Severity	Botswana 61			Islamabad 62			Karachi 101			Zimbabwe 194		
	Very	Fairly	Not	Very	Fairly	Not	Very	Fairly	Not	Very	Fairly	Not
	Per cent											
Insufficient time	20	15	66	20	26	55	22	13	65	19	29	52
Too many pupils	10	5	55	5	19	76	14	7	79	8	18	74
Lack of pupil interest	3	2	95	2	13	86	9	11	80	3	9	88
Lack of teacher interest	10	10	29	3	7	90	10	6	84	4	17	80
Staff lack of knowledge	48	14	38	13	24	63	19	9	72	20	27	53
Lack of resources	54	5	39	32	15	53	28	9	63	61	14	25
Available materials no good	28	10	61	27	11	62	18	8	74	39	19	42
Obtaining materials difficult	49	10	41	31	14	55	26	6	68	63	13	24
Lack of space	10	3	37	27	10	63	24	3	73	10	7	83

TABLE 13

School questionnaire: desired improvements

Countries/cities Sample size Severity	Botswana			Islamabad			Karachi			Zimbabwe		
	61			62			101			194		
	Very	Fairly	Not	Very	Fairly	Not	Very	Fairly	Not	Very	Fairly	Not
	Per cent											
New teachers' guide	82	8	10	47	15	39	45	7	49	62	24	13
New curriculum materials	77	9	13	40	23	57	40	7	54	69	18	13
New teaching aids posters, films etc	85	3	12	60	11	29	39	12	50	84	10	7
Advise on planning courses/syllabus	62	20	16	40	10	50	21	12	67	51	38	11
Teacher courses at school	74	12	15	57	8	36	42	8	51	62	22	15
Teacher courses at local centres	60	22	15	50	13	37	27	9	64	60	26	14
Provision of outside experts	55	16	25	40	11	48	32	6	62	67	18	15
Other support	3	0	96	3	0	96	1	0	99	7	1	91

More than 75 per cent of those fatally injured in Zimbabwe were crossing a road when injured. Seventy per cent of a sample of casualties were injured when walking with their back to the traffic. The main journey purpose of fatally injured pedestrians in Zimbabwe was walking from work to home.

The worldwide survey of Ministries of Education, suggested that road safety was a mandatory subject in about 50 per cent of developing country junior schools compared with 77 per cent in the developed countries replying. Eleven per cent of developing country Ministries suggested that road safety should be taught as a separate subject. The majority, 72 per cent, suggested Social Studies as the main co-topic. In Zimbabwe, 90 per cent of schools questioned, taught road safety within Social Study lessons.

In Karachi, less than 25 per cent of schools surveyed had provided road safety lessons in the year before being asked. In Botswana and Zimbabwe, about 50 per cent of schools questioned had provided at least one road safety lesson the previous year.

Overall, about 50 per cent of schools surveyed gave 'Lack of resources' as a 'Very serious' problem. 'Available road safety materials' and 'Difficulty in obtaining materials' were also 'Very serious' problems for schools in Zimbabwe and Botswana.

Teaching/learning aids such as posters and films were required by 85, 84 and 60 per cent of schools questioned in

Botswana, Zimbabwe and Islamabad respectively. New curriculum materials were 'Very important' in 77 per cent of schools sampled in Botswana.

Teacher courses in schools were a 'Very important' improvement in Botswana (74 per cent), Zimbabwe (62 per cent) and Islamabad (57 per cent). Over 50 per cent of schools from these countries stated that 'Courses for teachers at local centres' was also 'Very important'. Outside specialists were wanted by 55 per cent of schools in Botswana, 67 per cent in Zimbabwe and 40 per cent in Islamabad.

In conclusion, crossing busy roads involves a range of complex skills and effective ways of teaching these skills to young children in developing countries need to be researched. Questions such as what, how, when and who should teach road safety in schools need to be thoroughly investigated. For example, the study showed that in PNG and Zimbabwe about 70 per cent of a sample of pedestrians were injured when walking along roads with their back to the traffic. Seventy-two per cent of injured pedestrians in Karachi were injured when crossing a road. Such results suggest that crossing and using roads safely should form a fundamental part of any road safety education programme.

'Courses for teachers, off school premises' was judged 'Very useful' by over 50 per cent of all the schools sampled.

Although all road safety lessons taught in school may not be totally transmitted into adult life, making road safety an

integral part of educational curriculums has, potentially, considerable benefits. Therefore, researching road safety educational materials and resources for use in developing country primary schools and their curriculums has been chosen to form phase two of this TRL ongoing research programme.

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