



A TOOLKIT TO SUPPORT THE BOTNAR CHILD ROAD SAFETY CHALLENGE

TOOL 2

MOBILITY SURVEY

BOTNAR
Child Road Safety Challenge



The Global Road Safety Partnership is hosted by:



 The George Institute
for Global Health

WHO Collaborating Centre for
Injury Prevention and Trauma Care



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Acknowledgements

This publication is supported by Fondation Botnar and implemented by the Global Road Safety Partnership.

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This guidance document was written under the Botnar Child Road Safety Challenge with funding support from Fondation Botnar. It was written by Prasanthi Attwood, Elizabeth Towner and Margie Peden of The George Institute for Global Health, UK.

Recommended citation:

Attwood P, Towner E, Peden M. *The Botnar Child Road Safety Challenge Toolkit*,
<https://www.grsproadsafety.org/resources/botnar-challenge-toolkit>, Geneva, Switzerland, November 2021.

What is a mobility survey?

A mobility survey is a type of Knowledge, Attitude and Practice (KAP) survey which collects specific information from respondents about how, when, where, and why they travel.

A mobility survey can be administered in different ways e.g. self-administered paper questionnaires or on a computer or an interviewer can administer questionnaires in person. These different methods of administration will need to be taken into account when the mobility survey is designed as each will have differing resource needs (human, time and financial) and will have varying response rates.



For example:

A mobility survey about how children get to school can include questions about who brought them to school, what form of transport they used, what time they travelled, whether they felt safe, etc.

Why is a mobility survey useful?

A mobility survey is useful in helping to understand a group's travel arrangements, how far they travel, what types of transportation they regularly use and/or whether they have ever been involved in a motor vehicle crash in order to plan, implement, monitor and evaluate road safety interventions.

How do mobility and KAP surveys differ?

Also known as a travel survey, a mobility survey gives information about how students and their parents/carers, and/or staff currently travel to/from school and what issues are faced by them on their journey. It can assess how they would prefer to travel to school, what their views are on different travel options, how their journey might be improved and what other issues they may have with their journey to school.

A mobility survey differs from a KAP survey in the question that it wants to answer. The KAP survey can be used as a tool to assess the knowledge and attitudes of different groups towards any aspect of road safety that is of interest to the project's goals e.g. speeding, road safety education programs.

A mobility survey, by contrast, gives a cross-sectional assessment of how students, parents and/or teachers journey to and from school. The steps involved in a mobility survey however are very similar to that of a KAP survey (see Tool X available in the Botnar CRSC COP).

When can a mobility survey be conducted?

A mobility survey can be used in *all* stages of a project and can complement the findings of focus groups, in-depth interviews and observational studies.

In the **early stages** of a project, mobility surveys may explore participants' travel arrangements to help in the development and targeting of an appropriate intervention and in targeting groups at most risk

In the **development stage**, mobility surveys can be used to contribute to the design of the intervention (e.g. understand mode breakdown, volunteers to supervise children when crossing a busy road.)

In the **evaluation stage** of the intervention, mobility surveys can help to measure whether the intervention has had any effect by comparing baseline surveys before the intervention and follow-up surveys, after the intervention has taken place.

Do I need ethical approval to carry out a mobility survey?

Mobility surveys will need to be developed taking into account the 'Ethical Considerations for all Challenge Projects' shared with your project team during the negotiation phase (also available in the Botnar CRSC COP). Permission is needed from relevant bodies and authorities to conduct any survey. This includes the approval of school principals and of parents, the approval of participants and of municipal bodies (e.g. local or state departments of education, road safety and health boards)

A number (code or ID number) needs to be assigned to each participant to help with data handling, storage and analysis. This will also help ensure confidentiality of respondents.



An example of a Consent Form is provided in Annex 1.1 and a Covering Letter for parents to take part in a survey is provided in Annex 1.2. These can be adapted to suit the need of the mobility survey and the target population.

How to conduct a mobility survey

▷ STEP 1: Decide on what you want to find out

It is important to have a clear objective for the mobility survey and to develop a thorough survey protocol. What does your survey need to find out? How will the tool relate to the overall project goals and objectives? How will you strategically use the information gathered?



For example:

A mobility survey with an objective of understanding how children travel to school can include questions about transport used, safety equipment (helmet, seat-belt) used, travel distances, and any motor vehicle collisions in the past 12 months.

In order to execute a mobility survey and allow reasonable time and resources for each stage of the survey, you will need to create a protocol that outlines the steps involved from conception through to dissemination of results with a time frame for each step.

The survey protocol will need to set out the methods which will be used, what population will be surveyed.



For example:

If children aged 11-14 years are to be surveyed, then it will consider how the respondents can be accessed. Will this be through schools? What is the population you are surveying? What is the setting – the location, the survey area and the schools involved? How will the survey instrument be designed? How will the sampling of potential participants be conducted. What consent procedures will be needed? Is training of staff required to conduct the survey? The organisation of all these elements will need to be set down and a suitable timetable developed.

▷ STEP 2: What resources will be needed?

A mobility survey does not have to be an expensive exercise and if planned well can be cost-effective. Develop a budget for your survey and consider all possible requirements including the costs of in-house and external human resources.

The following categories should be considered when developing a budget:

- Surveyors and supervisors with necessary training to administer the mobility survey questionnaire
- Data entry staff
- Written survey plan guidelines
- Survey instrument (questionnaire) developed and pilot tested before widespread use with respondents.
- Equipment (computers or other equipment needed e.g. printers/photocopiers)
- Materials – copying, markers, pens, counter?
- Travel (transportation to survey sites, per diems for staff)
- Miscellaneous (facility hire for training)

▷ STEP 3: Identify your study population

Road safety interventions target different audiences and your survey may as well. In relation to child road safety, the survey population may be children themselves, describing, for example, their trip to and from school, how many roads they cross, how safe they feel crossing roads. Within schools, children may be able to complete the mobility survey in the classroom, under the direction of teachers and/ or surveyors. This will help to maximise the response rate for the survey and allow any questions about the wording or how to fill in the questionnaires to be answered. The survey population could be the parents/ carers of these children; teachers; other school staff. The school can also help in access to these groups

▷ STEP 4: Decide on an appropriate sampling strategy

Sampling is needed to gather information from a representative segment of the population, so that

conclusions about the whole population can be drawn. It will be helpful to consult a statistician to make sure that the sample size is suitable for the purpose of the study. The number will relate to the aims of the study and also whether the results for different sub groups will be required. A larger sample will produce more accurate data, but will be more costly and time-consuming than a smaller sample. If your analysis plan includes comparing different subsets of the population, then your sample size should be calculated accordingly.

If the aim of the survey is to give a general idea of the travel patterns of a particular group (a pilot study), in order to develop a more detailed survey instrument, 30-40 respondents may be sufficient. But if the mobility survey is part of an evaluation of an intervention, the sample size will need to be larger. If you are doing before and after surveys try to keep the sample sizes about the same.

There are 3 different types of sampling:

1. The first is 'random sampling' in which each potential participant is chosen at random, so each individual will have the same chance of being selected. For example it may be that every 3rd name from the school register is taken to be a potential respondent or every other parent arriving at the school gate.
2. In 'purposeful sampling' each potential participant is selected in a structured manner, for example school children from 5 schools in the city with the highest rates of RTIs, in each school 3 classes of children aged 11-12 years are selected at random.
3. The third type, convenience sampling relates to sampling respondents who are conveniently available to the researcher to be interviewed. This method would introduce more bias than the others.

▷ STEP 5: Develop and test your survey instrument

Questions used in other studies on child road safety may provide a useful starting point to develop the list of suitable questions for inclusion in a mobility survey (see Annex 1.3 for an example of a mobility survey used in Hyderabad – note that not all the questions and/or terminology will be appropriate for your survey). You can also see the questions used in the USA on their Safe Routes to Schools website for parents <http://saferoutesdata.org>

The overall goal of the survey should be kept in mind when developing the questions. Only ask questions that will give you information that you "need to know" rather than information that is "nice to know". Keep the questions relevant and appropriate for the target audience and local context. For example, in a question on how young children travel to school, it may be beneficial to use pictures rather than words and ensure that all potential modes of travel are included e.g. motor scooter, three-wheeler. Tailoring the survey instrument to a specific setting will benefit from advice from local road safety experts and school teachers.

Some key tips for writing questions:

- Remember the purpose of your survey – don't ask questions that you won't need to use in analysis. The number of questions need to be kept to a minimum. Many surveys collect far too much information and much of this is not analysed. What questions are essential to answer your study aim? Keep the survey questions as short as possible (for example maximum 2 pages).
- Don't be afraid to discard questions – if you can't see a reason for keeping it then throw it out.
- Keep your audience at the forefront when writing the questions – what language do you need to use? Avoid complex questions especially where children are involved. Do you need to translate the questions?
- Keep the questions simple to avoid confusion – break apart complex questions to keep each one simple and concise. Avoid technical terms and abbreviations.
- Avoid leading questions e.g. most people believe that speeding is dangerous – do you agree
- The appearance of the survey instrument is important- the layout of questions and the instructions, the overall length of the survey instrument may affect completion rates.
- The order the questions are asked is important. Start with the least sensitive questions and build to the more sensitive ones.



Question types. It is important that the questions are accompanied by clear instructions on how to complete them (e.g. please tick one box, please tick one or more boxes). Questions that are close-ended are the easiest for respondents to complete and are less prone to error.

Close-ended questions can be multiple choice, scaled (e.g. Likert scale) or answered by Yes or No answers.

Open ended questions can be used for example 'do you have any other comments?' These need to be kept to a minimum because they will be more time consuming to code and analyse and it may be more appropriate to use In-Depth Interviews instead.

Piloting. Once you have a draft of the possible questions, pilot test it on a small sample of your target population (e.g. 5-10 respondents) and discuss the questionnaire with the respondents. Try to find out whether there are any questions that they found difficult to understand, whether they did not understand any of the words or meanings, whether the wording could be changed, was the questionnaire too long, were there any questions that could be removed or others that could be added. A second pilot of the revised questionnaire (perhaps with 5 respondents) could improve the instrument still further. This second pilot could perhaps be used as part of the training for survey interviewers.

Translation of questions. In some settings, the survey questionnaire may need to be translated into the local language or languages. Asking the same question to all respondents is necessary to guarantee the validity of the results. If you have the funds, you can engage a professional translator, if not you can test the translated questions on a couple of people who speak the local dialect. The survey team should then translate this version back to English to make sure that the original meaning of the questions has been maintained. The idea is not to translate the questions word-for-word but to translate the meanings of the questions.

At each step of the design, modify survey items and the survey instrument itself on the basis of information gathered at that step, particularly information gathered during the pilot test.

▷ STEP 6: Train your fieldworkers

Staff will need to be recruited with some experience in developing and administering questionnaires. Other researchers may provide expertise in data entry and statistical advice.

The mobility survey needs to be carried out by a team of surveyors conducting interviews with respondents, with supervisors managing the survey and providing support. All members of the study team need to understand the principles of the survey and the procedure for administering the survey questionnaire. The surveyors must be provided with training so that they have the communication skills needed to conduct interviews/ administer questionnaires. The aim is to avoid bias that could significantly affect the results of the survey. This training could include a mix of lecture-type presentations, participatory group discussions and role-playing in interviewing.

In order that the team members understand the principles of the survey, some background on road safety, on the survey objectives need to be presented. The importance of informed consent and confidentiality of the data need to be stressed and the manner in which the surveyor presents this important information to participants. Above all, surveyors need to be trained to administer the survey in a consistent manner.

Example A: Who accompanied you to school this morning? (Only all that apply)

- A parent
- A grandparent
- A sibling
- Another adult
- I came alone

Example B: Road safety is a problem around my school (only choose one)

0-----0-----0-----0-----0-----0
 strongly agree neutral disagree strongly disagree

Example C: How often do you use the zebra crossing to cross the main road outside the school?

- I always use the crossing
- I often use the crossing
- I rarely use the crossing
- I never use the crossing
- There is no zebra crossing outside my school

Example D: In the last 12 months were you involved in a motor vehicle collision?

- Yes
- No

Example E: Do you have any suggestions on how to improve safety around your school?

▷ STEP 7: Administer the survey

Mobility surveys can be administered in different ways and these methods need to be taken into account when the survey is designed. The length, level and complexity of the questionnaire may be different.



For example:

A questionnaire that is designed to be self-administered (i.e. without the guidance of an interviewer) needs to be shorter and easier to follow, with clear instructions on how to answer the questions e.g. “please tick only one box” or “please tick one or more boxes”).

When the survey is administered by a trained interviewer, the interviewer can make sure that the respondent understands the instructions for each question.



For example:

The initial question on a child’s journey to school shows that the child travelled to school on a cycle, the interviewer can then skip to the next set of questions related to cycling. Thus the format of the questionnaire can be more complex.

Types of surveys can include:

- Self-completed, paper-based, surveys
- Self-completed, computer-based, surveys. This may be using on-line software, tool such as Survey Monkey
- An interviewer can administer a survey in person, one-to-one
- An interviewer can administer a survey or remotely on the telephone.

▷ STEP 8: Analyse, interpret and report the data

Data entry. In a well- designed questionnaire, a coding scheme should be developed for all the items in parallel with the questions.



For example:

A question about ‘How safe do you feel crossing the roads outside your school?’, can be coded 01 for ‘very safe’, 02 for ‘quite safe’, 03 for ‘a bit unsafe’ and 04 for ‘not safe at all’. Standard coding for all questions could be 77 for ‘don’t know’ and 99 for missing values.

Ideally data should be entered onto an electronic database at the end of each interview session or when questionnaires are completed. The gold standard in data entry is double data entry (i.e. where two different data collectors input the same data), however, the realities of time and financial constraints may mean that single data entry, combined with a double entry check every 20 surveys is a more appropriate means of quality control.

Data analysis. It may initially be useful to explore what the broad patterns/trends are and what are the biggest areas of concern using tabulations or percentages based on the questions asked in your survey (see Table 1 in Annex 1.4 for an example). You can generate tables and/or graphs with the results you obtain such as the ones below.

Students travel characteristics	Proportion (%)
Travels to school with others (children or adults)	61.7
Travels to school with others (schoolmates or older siblings)	29.9
Travels to school alone	38.3
By age	
11	38.2
12	36.3
13	44.7
By gender	
Boys	45.8
Girls	32.1
By home-school distance	
Less than 300 m	42.2
300-600 m	40.0
600-900 m	35.1
More than 900 m	36.0

Source: Pojani & Boussauw, 2014

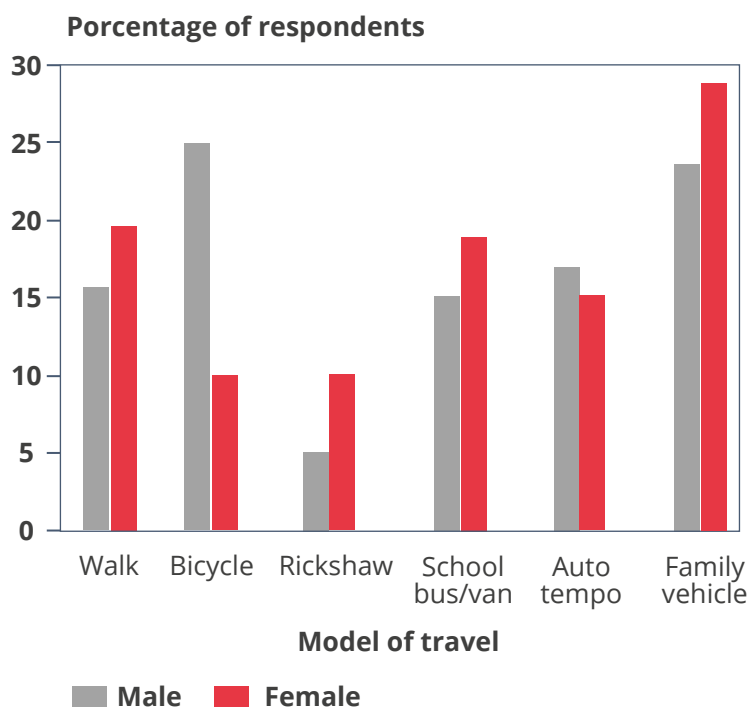


Fig 1. Gender aspect of travel mode choices for school trips. Source: (Singh & Vasudevan, 2018)

If you have access to a statistician they can assist you to analyse your data in more detail (see Table 2 in Annex 1.4). When the data analysis is complete, a brief report should be prepared and suggestions made about how the findings can be translated into action.

The report should include the following sections:

- The purpose of the mobility survey and the aims of the data collection.
- The number of participants who took part in the survey, the response rates.
- Background information about the participants (male/ female, age group etc.), the setting, where the survey was conducted.
- How the data were analysed.
- A summary of what the findings show, including graphs and tables.
- What else has been learned from the process?
- What has the mobility survey contributed to the study and how can the findings be used?

The final report should be made available to all stakeholders, and results should be presented at relevant meetings to encourage discussion.

References

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ANNEX 1.1. SAMPLE CONSENT FORM TEXT FOR PARENTS/ CARERS TO PARTICIPATE IN A SURVEY ON SAFE JOURNEYS TO SCHOOL.

(Draft only - please amend as appropriate)

[INSERT INSTITUTE LOGO]

Dear Sir/Madam,

Thank you for agreeing to take part in a short survey conducted by the (City Name's) 'Safer Roads Initiative'. The purpose of the survey is to find out from Parents/Carers how children aged 9-13 years journey to school and how we can keep them safe on their journey. The information gathered in the survey will help us to understand how to make the roads safer for your children when they go to and from school.

You can choose to stop the survey at any time and can ask at any time during the survey for your answers not to be used in the study. You do not have to answer every question. Please note that your responses will remain entirely confidential and will not be able to be traced back to you. Each completed survey will be assigned a number and your name will not be included in any report or publication that may come from this survey.

There are no right or wrong answers. We hope you will be happy to take part in the survey about your child's experience of journeying to school. The survey results can contribute to plans for making (City's name) a safer place for children in the future.

If you agree to participate in this survey we ask that you kindly sign below.

I understand this information and agree to take part in the survey.

Signed:	Print Name:	Date:



ANNEX 1.2. SAMPLE COVERING LETTER TEXT TO PARENTS/ CARERS FOR A SURVEY ON SAFE JOURNEYS TO SCHOOL

(Draft only - please amend as appropriate)

[INSERT INSTITUTE LOGO]

Dear Parent/Carer,

We hope that you will be willing to take part in our survey on Safe Journeys to School. The purpose of the Survey is to find out from Parents/ Carers how children aged 9-13 years travel to and from school and how we can keep them safe on our city's roads.

You can choose to stop the survey at any time and can ask at any time during the survey for your answers not to be used in the study. You do not have to answer every question. Please note that your responses will remain entirely confidential and will not be able to be traced back to you. Each completed survey will be assigned a number and your name will not be included in any report or publication that may come from this survey.

Enclosed with this letter is the survey questionnaire which we hope you will complete and return in the envelope provided. For each question please follow the instructions provided – some questions require just one answer whilst others may involve ticking more than one box. If you have any questions about the survey or any concerns about how the findings will be used, please contact the Project officer by telephone or email (contact details provided below).

The information gathered in the survey will help us to understand how to make the roads safer for your children when they journey to and from school.

Yours sincerely,

Name, Project Office, Safer Roads Initiative (telephone number:....., email:.....)



**ANNEX 1.3.
EXAMPLE MOBILITY SURVEY (SOURCE: TETALI S ET AL, 2015)**

Survey in the Public Health Impacts of Children’s Travel to School

Please answer the following questions as best as you can-there are no right or wrong answers. The answer you give will be kept private. Thank you for your help.

1. Name

2. Age years

3. Gender 1. Boy 2. Girl

4. Home adress & landwark

Travel to School

5. How did you travel to school today?

No.	Model of travel	From	To	Time taken (minutes)
1	Walk			
2	Cycle			
3	School bus			
4	Car			
5	2 wheeler			
6	RTC bus			
7	Auto-rickshaw			
8	Cycle-rickshaw			
9	Train			
10	Other			

6. With whom did you come to school today?

1. Parent 2. Grand-parent 3. Other children 4. Other adult 5. Alone

7. How do you travel to school during a usual week

1. Walk 2. Cycle 3. School bus 4. Car 5. 2 wheeler
6. RTC bus 7. Auto 8. Rickshaw 9. Train 10. Other

Travel to Home

8. How will you go from school to home today?

1. Walk 2. Cycle 3. School bus 4. Car 5. 2 wheeler
6. RTC bus 7. Auto 8. Rickshaw 9. Train 10. Other

9. With whom will you go from school to home today?

1. Parent 2. Grand-parent 3. Other children 4. Other adult 5. Alone

10. How do you travel home during a usual week?

1. Walk 2. Cycle 3. School bus 4. Car 5. 2 wheeler
6. RTC bus 7. Auto 8. Rickshaw 9. Train 10. Other

11. How will you LIKE to or WISH to travel to and from school?

1. Walk 2. Cycle 3. School bus 4. Car 5. 2 wheeler
6. RTC bus 7. Auto 8. Rickshaw 9. Train 10. Other

12. How do you travel to school during the RAINS?

1. Walk 2. Cycle 3. School bus 4. Car 5. 2 wheeler
6. RTC bus 7. Auto 8. Rickshaw 9. Train 10. Other

13. How do you travel to school during the HOT WEATHER?

1. Walk 2. Cycle 3. School bus 4. Car 5. 2 wheeler
6. RTC bus 7. Auto 8. Rickshaw 9. Train 10. Other

14. Are you allowed by your parents to cross main roads alone? (Main roads are important, busy roads with lots of traffic)

1. Always 2. Sometimes 3. Rarely 4. Never

15. Are you allowed by your parents to cycle on main roads alone?

1. Always 2. Sometimes 3. Rarely 4. Never 5. I don't know cycling

16. How safe do you feel when you travel to and from school? (Safe means not worried, not feeling uneasy about anything in particular)

1. Very safe 2. Fairly safe 3. Not very safe 4. Not at all safe

17. What are you worried about, during your journey to school?

1. Traffic 2. Strangers 3. Being late
4. Getting lost 5. Being teased 6. Nothing

18. During the past week, after school, on how many days did you exercise?

*(Example: running, fast walking, playing games, cycling, dancing, sports).
Do not include your PT or games period.*

- None 1 day 2 days 3 days 4 days
5 days 6 days 7 days

19. During the past week, after school, how many hours did you exercise?

Do not include your PT or games period.

- None half an hour a week 1 hour a week
2-3 hours a week 4-6 hours a week 7 hours a week

20. During the past week, how many PT or games periods did you attend?

- None 1 period 2 periods 3 periods 4 periods
5 periods 6 periods 7 periods

21. During the past 12 months, were you injured in a road accident? (An injury is when it makes you miss at least one full day of usual activities **OR** requires treatment by a doctor or a nurse).

1. Yes 2. No

Source: Tetali S, Edwards P, Murthy GV, Roberts I. Development and validation of a self-administered questionnaire to estimate the distance and mode of children's travel to school in urban India. *BMC Med Res Methodol.* 2015;15(1):92.



ANNEX 1.4. EXAMPLE OF AN ANALYSIS OF MOBILITY SURVEYS (SOURCE: TETALI S ET AL, 2017)

Aim of study: The purpose of this study was to explore the determinants and distribution of school travel in Hyderabad, India – looking at what factors are associated with using differing modes of transport and how distance from to school may have an effect on the journey.

Sampling Frame: Type of school (Government, semi-private and private) was used as a marker of socio-economic status and parental influence. The schools in the study were selected at random from lists of schools obtained from the District Education Office. All children from grades 6-9 who were present on the day of the survey in the selected schools were included in the survey.

Survey Tool: The self-administered questionnaire which had pre-tested and validated in previous studies (see Annex 1.3) was used to collect information on the usual mode of transport to school, mode of transport during the heavy rains, parental permission for independent travel, children’s perception of safety and physical activity after school.

Method of analysis: Data was entered into Stata and statistical analysis run looking at associations between travel to school and distance from school.

Results: Table 1 shows the main characteristics of the survey sample. Table 2 demonstrates the distribution of the usual mode of transport to school by school type. The study showed that most children in Hyderabad walk (57%) or cycle (6%) to school. Distance to school was strongly associated with the use of motorised transport. The authors of the study concluded that with high levels of walking and cycling amongst children in Hyderabad there is an urgent need to ensure the safety of the children on their journey to school. Social policies that decrease the distance travelled to school by children could have a large impact on road traffic injuries, air pollution and physical activity levels.

	Government	Semi-private	Private	Total
Number of schools	16	15	14	45
n (%)	1,836 (31)	1,585 (27)	2,421 (41)	5,842 (100)
Boys n (%)	768 (42)	762 (48)	1,129 (47)	2,659 (46)
Girls n (%)	1,068 (58)	823 (52)	1,292 (53)	3,183 (54)
Age in years (mean, SD)	13 (2)	13 (2)	13 (1)	13 (1.3)

Travel mode to school	Government		Semi-private		Private		Overall	
	%	(95 % CI)	%	(95 % CI)	%	(95 % CI)	%	(95 % CI)
Walk	69.0	(58, 79)	68.0	(59, 76)	53.0	(34, 71)	57.0	(41, 71)
Cycle	6.0	(4, 11)	6.0	(4, 9)	6.0	(3, 9)	6.0	(4, 8)
School bus	0.6	(0.2, 2)	1.0	(0.2, 8)	11.0	(5, 21)	8.0	(4, 17)
Car	0.5	(0.2, 1)	0.2	(0, 1)	5.0	(2, 16)	4.0	(1, 12)
2 wheeler	2.0	(1, 3)	10.0	(6, 16)	11.0	(7, 16)	9.0	(6, 14)
RTC bus	19.0	(10, 34)	10.0	(4, 25)	2.0	(1, 5)	5.0	(3, 10)
Auto-rickshaw	2.0	(1, 6)	4.0	(2, 7)	12.0	(5, 27)	10.0	(4, 21)
Cycle-rickshaw	1.0	(0, 1)	1.0	(0.2, 1)	0.3	(0.1, 1)	0.3	(0.1, 0.5)
Train	0.0	(0, 0)	0.0	(0, 0.3)	0.0	(0, 0)	0.0	(0, 0)
Other	0.1	(0, 1)	0.1	(0, 1)	1.0	(0.3, 3)	0.07	(0.3, 2)
Distance (km) to school (mean, SD)	1.7	(24)	1.4	(2.9)	2.3	(2.1)	2.0	(2.6)

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