

What Do Existing Household Surveys Tell Us About Gender and Transportation in Developing Countries?

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Access to affordable, reliable, and safe transportation is critical in improving the welfare of individuals in developing countries. Yet, transport data are limited overall, and data that address the different patterns of use by women and men are even scarcer. A few studies have shown, however, that women and men have different transport needs and constraints. Typically, analysis of these topics has been hampered largely by the costs involved in carrying out the large-scale transportation surveys needed to provide such data. There are household surveys, however, that can provide further insights into how women and men use transportation in the developing world. Four common household surveys—income and expenditure surveys, living standards measurement study surveys, demographic and health surveys, and multiple indicator cluster surveys—are reviewed to identify the extent to which they can provide transportation planners and researchers with relevant data. The results are mixed. Substantial data on one or two aspects of transportation, such as cost and mode used to visit education and health facilities, are available across countries; however, the surveys contain little information on other important factors, such as mode choice, security, and travel patterns. A marginal influence on surveys to expand the data collected on gender and transportation may be possible. Stand-alone transport surveys, however, will continue to be needed to foster the production of gender statistics in transportation in developing countries and the incorporation of gender differences into transport decisions.

Access to affordable, reliable, and safe transportation can be critical in improving the welfare of individuals and households in developing countries. Transportation opens up earnings opportunities, facilitates schooling and health care, and allows households to take advantage of other services and infrastructure. To maximize the effect of transportation spending on development, policy makers need to understand the constraints that all individuals and households face in using transportation. Traditionally, transport planning models have not considered women's specific travel patterns. This failure to address the different travel and transport needs of men and women resulting from their social and economic roles reduces the effectiveness of transportation spending and policy and can have a negative effect on economic growth and poverty reduction.

Dedicated transport surveys, carried out at the household and individual levels, provide much of the information needed for policy in the sector, and transport planners and policy makers rely heavily on them. However, few such surveys are conducted in developing countries. Surveys that allow disaggregation of access and use patterns by gender are costly in terms of time and other resources and therefore are done infrequently.¹ Most countries cannot afford to implement such surveys at any given time and are even less able to carry out the

¹ The 2003 National Household Travel Survey by the Department of Transport of South Africa was a nationwide effort to provide strategic insight into the travel patterns and transport problems of households; it provided a unique example of what can be done to survey the demand for transport of women. The technical report highlighting the survey results can be found at <http://www.transport.gov.za/projects/nts/TechnicalReport.html>.

multiple rounds of a survey that are needed for trend analysis. Other sources of data need to be found if policy makers in developing countries are to incorporate gender considerations into transport policy.

The purpose of this paper is to explore other household and individual data sources that exist in developing countries to determine whether they can provide insights into transport and gender issues. Most countries carry out household surveys that, although not designed to provide specific transport sector data, may contain useable information for policy makers. Exploiting such household surveys could be a way to improve transport policy for women without massive expenditures. Additionally, unlike dedicated transport surveys, which are done as stand-alone efforts, the surveys that form part of a country's national statistical system are more likely to be repeated, thus ensuring the availability of future data. Finally, the methodology of these surveys is often fairly standardized, which facilitates cross-country comparisons.

To determine what type of gender data are available to policy makers in the transportation field, four common household surveys are reviewed here: household budget or income and expenditure surveys (HBS-IES), living standard measurement study (LSMS) surveys, demographic and health surveys (DHS), and multiple indicator cluster surveys (MICS). Examples of each type of survey are used to illustrate the extent to which they provide data on transportation. The paper concludes with recommendations for changes that could be made to allow greater analysis of how transportation and gender interact to affect an individual's welfare.

GENDER DIFFERENCES IN TRANSPORT

The literature on gender and transport in developing countries is not extensive. However, the work that has been done identifies some important areas for transportation and development policy. Dissimilarities between men and women exist in relation to trip purpose, frequency and distance of travel, mode of transport used, mobility constraints to access other sector services such as health, and complexity of trip making.

Accessibility and Transport Choice

Understanding and measuring accessibility is essential to assess the transport constraints that individuals may face in reaching work and nonwork opportunities (Srinivasan 2005). Women tend to have access to fewer transport choices, thereby constraining their ability to travel. Men are often given priority in terms of household transport decisions. A survey in Lagos, Nigeria, showed that the decision to acquire a private automobile was made

solely by the husband in almost three-fifths (59%) of households (Odufuwa 2007). In particular, women tend to have less access to cars; studies have shown that in households where there is a private car, men usually get priority for its use. This lack of access to private vehicles is reflected in women's less frequent travel and shorter distances traveled than men's (Anand and Tiwari 2006; Hanson and Hanson 1980). The greatest disparity in access to cars has been observed in rural areas, where three times more men than women use this mode of travel (Venter et al. 2007).

Affordability of Transport Modes

Transportation costs can represent a significant share of households' budgets in most developing countries. Goddard and Diaz (2000) found transport to account for between 8% and 16% of households' budgets in a number of developing countries in Africa. Women have been found to spend a greater share of their income on public transport than men. A study in Kampala, Uganda, revealed that women spend as much as 29% of their income on public transport (Kamuhanda and Schmidt 2009). High costs of public transportation can make services particularly prohibitive for women when it comes to reaching their workplaces. As a result, women appear to work closer to home beyond a fixed cost threshold (Srinivasan 2005). Also, women tend to walk, and they rely on public transportation primarily for longer journeys.

Travel Patterns and Trip Purposes of Women

Studies to determine women's travel needs in urban and rural areas of developing countries have found that women's travel patterns typically derive from the multiple tasks they must perform in the household and the community (Hanson and Hanson 1980; Rosenbloom 2005). Women have multiple roles—as earners, child care providers, household managers, and, often, maintainers of community and social networks (Moser 1993). Owing in part to these multiple roles, women's travel patterns are more likely to be characterized by more frequent and shorter trips than those of men (Hanson and Hanson 1980; Odufuwa 2005). The complexity of the trips made by women often is greater than by men, as women combine trips for shopping and household errands with their journey to work to save time. Minimizing travel time and choosing work opportunities shorter distances from home allows women to minimize their travel time and balance the overlapping schedules of work and household responsibilities (Anand and Tiwari 2006).

Quality and Security Concerns

Studies have revealed that women are more willing than men to use public transport, independent of their car access, particularly if public transport can be provided in a clean, comfortable, and regular fashion with city-wide coverage (Okoko 2007). Women, however, can be particularly concerned with issues of trust in the role of public transport conductors and security.

DATA AND METHODOLOGY

The selection of surveys for reviewing data on gender and transportation was based on three criteria. First, surveys were chosen for their frequency likelihood, as the more often specific data are collected across countries and across time, the greater is the potential usefulness of the data. Second, to be useful, surveys needed to collect data at the individual level. Finally, surveys were chosen based on a judgment, *a priori*, of each survey's potential usefulness.² A general description of the four types of surveys reviewed is presented.

Living Standard Measurement Study Surveys

LSMS surveys were developed by the World Bank in the 1980s to provide new and better quality data on household behavior and on the interaction of households and policy. To meet these goals, LSMS surveys were developed as multitopic household surveys gathering information on a wide range of household and individual characteristics that affect welfare. Samples, while small to ensure quality control, are almost always nationally representative.³ Data are collected at the individual, household, and community levels.⁴ Previous work has shown that the LSMS surveys have the potential to contribute to knowledge on transportation in general even though it is not a specific topic area (Baker and Denning 2005). LSMS surveys have an additional advantage in that, for the majority of surveys, governments have made the data sets publicly available.⁵

² For example, while many countries carry out labor force surveys with great frequency, they were not included as their focus is narrow and of little relevance to the gender and transport linkages discussed here.

³ The few exceptions are in countries where conflict, violence, and social unrest can make it impossible to visit certain areas.

⁴ Further information on LSMS surveys is available at <http://www.worldbank.org/lsmis/>.

⁵ Not all governments have allowed open access. For information on how to obtain the survey data sets or to download many of them, see the LSMS website at <http://www.worldbank.org/lsmis/>.

Household Budget–Income and Expenditure Surveys

HBS–IES are designed to collect information on household expenditures, produce or update the weights for consumer price indices, and provide inputs for national accounts. Countries often add modules on income to their HBS to facilitate the measurement of national income as well. Most HBS–IES also collect a restricted set of basic questions on household members related to demographics, education, and employment status. With the exception of agricultural modules (included for income purposes), no other specific topics are traditionally collected in HBS–IES. Data are always collected at the household level, but some surveys also contain individual expenditure diaries. The advantage of HBS–IES as a data source is that these surveys are done in most countries and are done fairly systematically—annually in some parts of the world (Eastern Europe) and every 5 years in other areas (Latin America). Thus, one can compare transport patterns across countries and, more relevantly perhaps, over time within countries. The drawback of these surveys is that they are often difficult to obtain at the unit level. Permission is usually on a case-by-case basis.

Demographic and Health Surveys

DHS are designed to collect data on health—primarily maternal and infant health—but they may also contain data on household demographics and assets. The surveys, started in 1984, usually include basic characteristics of the household and the respondents, child health, education, family planning, fertility and fertility preferences, HIV/AIDS knowledge, attitudes and behavior, infant and child mortality, maternal health, nutrition, and socioeconomic indicators based on asset ownership.⁶ In specific countries, additional modules are applied. Data are collected at the individual and the household levels. The fact that the DHS are implemented systematically in many developing countries makes them a potentially valuable data source if they contain any relevant information on transport. Additionally, the DHS are publicly available and can be accessed on the DHS website upon registration.⁷

Multiple Indicator Cluster Surveys

MICS were first carried out in 1995 to provide the data needed to monitor progress on the goals adopted at

⁶ Information on the DHS comes from Vaessen et al. (2005) and the DHS website at <http://www.measuredhs.com>.

⁷ For more information on DHS or for registering to obtain data sets go to <http://www.measuredhs.com>.

the 1990 World Summit for Children.⁸ A second round was done in 2000 and a third was done in 2005–2006. More than 100 countries implemented MICS in the third round. The fourth round is planned for 2009–2010, and the frequency is expected to increase from every 5 years to every 3 years, given the importance of many of the indicators that are monitored with these surveys. The main topics covered by MICS are nutrition, child health and mortality, water and sanitation, housing, reproductive health and contraceptive use, literacy, child protection, labor, domestic violence, and other issues related to children and their welfare. A core questionnaire exists for each round of the survey, with each country doing some degree of customization given its circumstances and health issues.⁹

Twelve data sets or questionnaires were reviewed to determine the surveys' ability to inform transport policy from a gender perspective. From the pool of LSMS surveys, Bosnia and Herzegovina (2001), Guatemala (2000), Malawi (2004), and Panama (2003) were included. Guatemala was picked for the extra transportation questions that had been added for a specific policy concern. Only one HBS–IES survey was included: Brazil's household expenditure survey [*Pesquisa de Orcamentos Familiares* (POF) 2002–2003].¹⁰ Ethiopia (2000) and Haiti (2000) were the two surveys included from DHS, and for MICS the core questionnaire was reviewed as well as those of Thailand (2005), Bosnia and Herzegovina (2006), and Kazakhstan (2006).

WHAT THE SURVEYS CAN TELL US

Addressing all the issues relevant for understanding gender-specific transportation behavior requires a substantial amount of data. Four areas were identified where better data on how gender and transport interact could be of use for transportation planners: (a) access to transport by women, (b) affordability, (c) journey length and reasons for travel, and (d) quality of transport. The reviewed surveys show several limitations for the analysis of transport access and gender, as these different types of surveys do not address the full range of questions of interest. Useful information is being collected, however; the most common type of data available relate to transport use for accessing health and education facilities.

⁸ Information describing the MICS is available at http://www.unicef.org/statistics/index_24302.html. MICS data sets and documentation are available at http://www.childinfo.org/mics3_surveys.html.

⁹ Most MICS data sets are available from <http://www.childinfo.org>.

¹⁰ A second data set with individual diary information from Belize, the Household Expense Survey 2008–2009, was not available in time to be included in this paper.

Transport Access

No overall measure of transport access can be constructed from any of the surveys. The LSMS surveys provide the most detailed data, with trip and use information collected for some specific activities such as health, education, and labor (see section on journey length and reasons for travel), but the overall use or demand for individual transport needs cannot be determined. In addition, while LSMS surveys do collect community-level information on transportation (e.g., community access to paved and unpaved roads, existence of bus service), there is a lack of information on the choices an individual has in terms of transportation for specific activities. This situation limits the assessment of preferences in transportation and access.

HBS–IES can provide individual expenditures on mode of transport, by urban and rural areas, allowing more analysis of transport access and gender differences. Brazil's household expenditure survey (POF) reports the number of individuals with expenditures on modes of transportation the week before the survey. The survey results for 2002–2003 appear to indicate that women tend to rely on public buses, informal private modes (vans, minivans, and moto-taxis), and intermediate modes of transport such as taxis more than men (see Figure 1). This finding appears to confirm results from existing transport surveys. In particular, the results showed that 65% of all women used public buses in the week before the survey, while only 42% of men did.¹¹ Men were more likely to use private modes of transport such as cars, with more than a third of all men paying for gas (categorized as gas, ethanol, diesel, kerosene, or liquid gas) while only 11% of women did so.

When distinguishing between urban and rural areas, the Brazil POF shows that men who lived in rural areas had almost twice the average expenditure on interstate buses compared with men in urban areas, while women from rural areas averaged less spending on interstate buses than did urban women (see Figure 2). This finding may be explained by the fact that men from rural areas are more likely commute to work by interstate bus, whereas rural women are more likely to travel closer to home—and most likely on foot—to accomplish their household and domestic work.

Although the Brazil POF uses individual diaries, data are collected in an aggregated form. Specifically, this practice means that while data are collected for a wide range of transport-related expenditures (see Appendix A for complete list) they are not collected for each trip but instead are aggregated by type of expenditure over the entire reference period (7 days). As a result, the data

¹¹ Public buses refer to the following categories: bus, intercity bus, and interstate bus.

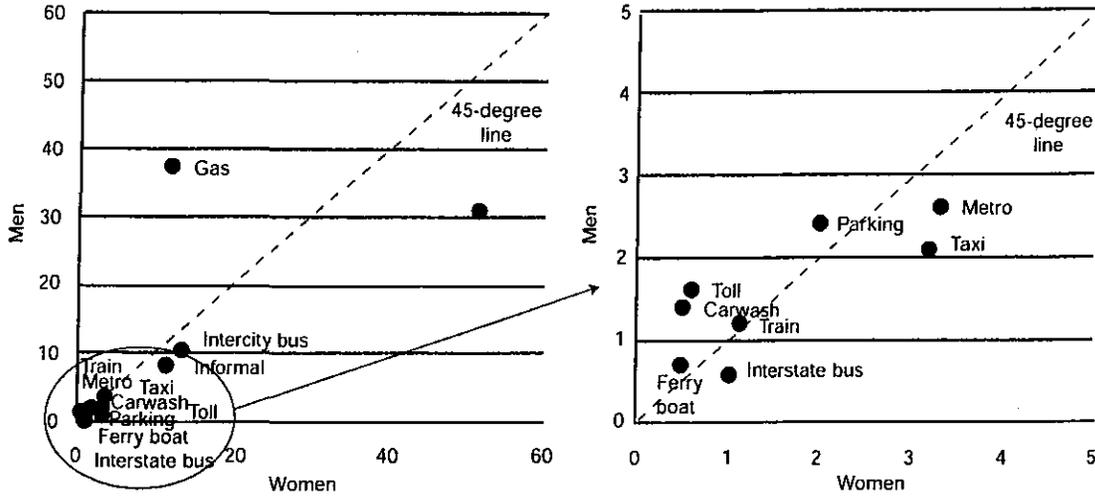


FIGURE 1 Type of transport expenditure made by women and men in Brazil (percentage of men and women who made each type of expenditure per week): 2002–2003. (SOURCE: POF 2002–2003; authors’ calculations.)

can show how much a person spent on local bus trips during the week but not how many trips were taken. Other HBS–IES with individual diaries may not have this limitation.

Using HBS–IES surveys for analyzing gender and transport access has limitations. The surveys typically present no disaggregation per trip type or number of trips taken, making it difficult to assess mode shares and individual demand

for transportation. Also, as HBS–IES are expenditure surveys, any movements that do not require an expenditure are not recorded, which includes any travel by foot. Likewise, trips by private transport that do not incur an immediate cost, such as using one’s own bicycle, do not appear, nor do trips that are subsidized in their entirety, such as school buses and employer-provided transport. Finally, HBS–IES do not permit an assessment of what share of movements

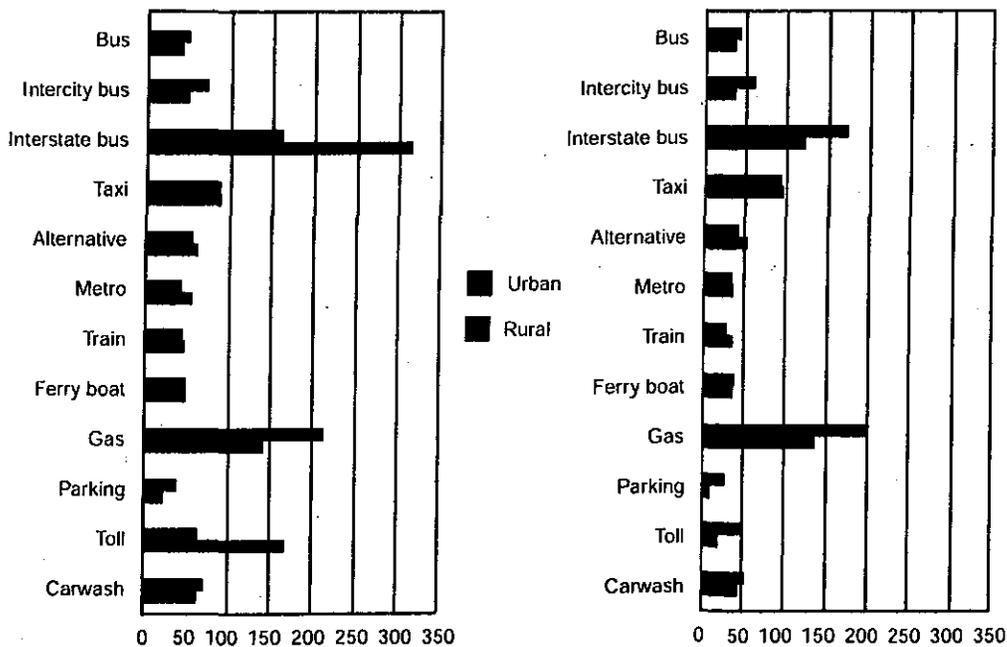


FIGURE 2 Average expenditures (reais per week), by mode of transport used by (a) men and (b) women in Brazil: 2002–2003. (SOURCE: POF 2002–2003; authors’ calculations.)

(school, work, market, social engagements) are done by using different forms of transportation.

A second limitation in using HBS-IES data for assessing gender differences in accessibility is that costs related to mode use in such surveys are aggregated, posing difficulty for estimating private transport use. For trips by private vehicle, it is not possible to directly link cost with use. One person in the household may drive the car but not pay for gas, leaving that to another household user. Items such as daily parking and tolls provide indications of use patterns but, in their absence, the actual use of a household-owned private vehicle cannot be determined.

Transport Affordability

HBS-IES appear to be the most relevant surveys for collecting information about expenditures on transport, but such surveys are often done at the household level only. However, more HBS-IES are including individual diaries of expenditures in addition to the overall household diary. This information allows an examination of spending by males and females on transportation. In some cases, the surveys may also provide information on the types of transportation being used. The usefulness of HBS-IES depends on the level at which expenditures are recorded and entered into the data set.

Results from Brazil's POF showed that men's expenditures on all items related to private vehicles (tolls, parking, gas, car washes) are higher than those for women (see Table 1). However, no conclusions can be drawn on whether one form of transport is more or less expensive for men or women as there are no data on the number of trips. Looking at the incidence of transportation expenditures by welfare quintile (based on consumption) shows that, as expected, as welfare levels rise the incidence of public transportation expenditures falls and private transport expenditures increase. The decline is less for women than for men in most areas. For both men and women, informal transport expenditures are the most common among the poorest, with the amount dropping dramatically as welfare levels rise, indicating, perhaps, the lower quality of this good.

Other HBS-IES, unlike the POF reviewed here, use more open-ended questions to collect transport-related expenditure data. Surveys, such as the Belize 2008-2009 Household Expenditure Survey, collect data on each specific expenditure for transportation. These data provide a more comprehensive look at transportation spending by men and women, the modes of public transport used by gender, and the associated expenditures. One can relate expenditures on transport to total expenditures of individuals and households and how they vary geographically and by the welfare status of households.¹²

TABLE 1 Incidence of Expenditures in Brazil, by Consumption Quintile and Type of Transport

Consumption Quintile	Female (%)	Male (%)	Total (%)
Municipal bus	(n = 10,720)	(n = 7,906)	(n = 18,626)
1	24.4	27.2	25.6
2	23.7	24.5	24
3	21.3	20.7	21.1
4	18.3	16.6	17.6
5	12.3	11	11.7
Alternative	(n = 3,138)	(n = 3,061)	(n = 6,199)
1	43.7	48.6	46.1
2	23.7	22.7	23.2
3	17.1	14.7	15.9
4	9.9	8.5	9.2
5	5.7	5.5	5.6
Intercity bus	(n = 2,630)	(n = 2,642)	(n = 5,272)
1	30.7	35.2	32.9
2	22.1	25.4	23.7
3	19.5	17.4	18.5
4	16.2	13.4	14.8
5	11.5	8.6	10.1
Taxi	(n = 832)	(n = 669)	(n = 1,501)
1	13.2	18.7	15.7
2	15.4	17.5	16.3
3	16.1	17.9	16.9
4	21	16.3	18.9
5	34.3	29.6	32.2
Gas	(n = 2,617)	(n = 10,474)	(n = 13,091)
1	3.8	14	11.9
2	7.9	16.7	15
3	13.8	20.5	19.1
4	24.8	22.4	22.8
5	49.7	26.5	31.1

SOURCE: Brazil, POF 2002-2003. Individual expenditures on transportation.

Journey Length and Reasons for Travel

LSMS surveys can provide evidence of whether there are different uses of transportation by males and females for two important areas of transportation use: health and education. Data also exist on transportation related to labor but only in a small fraction of countries (see Appendix A). While the core questionnaire of the MICS does not contain related questions, some of the countries have customized their survey to incorporate such variables. The DHS has limited information and the HBS-IES has none.

Education

No information on the reasons for travel, existing transportation options, or why an individual—male or female—chooses one form of transport over another can be found in the HBS-IES, as they focus on expenditures only. LSMS surveys, on the other hand, while collecting data on transportation expenditures and vehicle ownership at the household level, also collect data for individuals. In almost 60% of the countries with LSMS surveys reviewed

¹² The Belize data were not available at the time of writing this paper.

within the context of the World Bank's website on LSMS surveys,¹³ all individuals attending school were asked questions about the type of transportation used to get to school and, in many cases, the amount of money spent on school-related transportation. Questions on education-related transportation are typically asked of individuals of primary-school age and older and are conditioned on whether the individual attends school. If so, the child (or the child's parent or guardian) is asked to provide information on the mode of transport used and how much was spent on education-related transport. Also, data are collected on reasons for not attending school: distance and transport issues are usually included in the list of possible answers. (Appendix A provides examples of these types of questions from different LSMS surveys.)

These types of questions, while limited to education-related travel, address many of the key gender-transport questions raised in the literature: reasons for transport, types of transport used, cost, and average time needed. An overview of the data available from four LSMS surveys—Bosnia and Herzegovina, Guatemala, Malawi, and Panama¹⁴—shows the type of information available and provides quick insights into how much transportation can vary across countries and the extent to which gender matters.

In Malawi, as shown below, practically all children who attend school walk to their school:¹⁵

Mode of Transport	Percent
Foot	98.5
Bicycle	0.6
Bus/Minibus	0.5
Private Vehicle	0.4
All	100.0

The situation is different for children in Panama, where almost half use buses as their primary mode of transportation—some are specifically designated as school buses and others are regular buses (Table 2). As most children walk to school in Malawi, there are no significant differences between boys and girls:¹⁶

¹³ Data are from <http://research.worldbank.org/lsmssurveyfinder.htm>. This website contains information only on LSMS surveys done with the support or involvement of the World Bank; many other LSMS surveys have been done in recent years, but reviewing their content is outside the scope of this paper. The number of surveys with transport by gender information is probably greater.

¹⁴ The surveys in Bosnia and Herzegovina, Panama, and Malawi are fairly standard in terms of the transportation questions asked. The Guatemala survey, however, had significantly more questions related to transport as it was a topic of interest at the time.

¹⁵ Source: Second Integrated Household Survey, Malawi, 2004. Authors' calculations.

¹⁶ Source: Second Integrated Household Survey, Malawi, 2004. Authors' calculations.

	Time to School (min)	Standard Error
All	25.2	-0.162
Boys	25.2	-0.231
Girls	25.1	-0.237

In Panama, however, girls are more likely than boys to travel to school by bus (Table 2). While the difference is statistically significant (at the .001 level), it is not large, which helps to explain why there are no differences in terms of transportation spending and in terms of time spent traveling to school (Table 3). In contrast, females in Bosnia and Herzegovina pay almost a third more for transport than boys do (Table 4). Time traveling to school, however, does not vary and since the Bosnia and Herzegovina survey does not ask about mode of transportation, it is not clear what is driving the greater expenditures for girls.

Using the Guatemala survey as an example of the importance of being able to link community level data with the household or individual data, the characteristics of the community and its location vis-à-vis schools can be used to assess the impact of distance on use of services. Enrollment is higher in communities with paved roads. As one would expect, the percentage of children enrolled in school declines the farther away the schools are (Table 5).

Health

As is the case with education, LSMS surveys provide some information on transport for access and use of health services. The surveys often ask individuals how long it took them to get to a health facility, the mode of transport used, and the associated costs. As data are collected at the individual level, it is possible to determine how men and women vary in their use of transportation to access health services. (A list of the questions related to transportation and health in several LSMS surveys is provided in Appendix A.) In addition, for health care

TABLE 2 Mode of Transport Used to Attend School in Panama: 2003

Mode of Transport	Males	Females	All
Bus or taxi	34.4	39.9	37.2
School bus	9.4	9.4	9.4
Private car	6.4	6.9	6.7
Bicycle	1.4	0.6	1
Boat	0.9	0.6	0.8
Horse	0.3	0.3	0.3
Walking	47.1	42.3	44.6
Other	0.1	0.1	0.1

SOURCE: Encuesta de Niveles de Vida, Panama 2003, authors' calculations.

TABLE 3 Schooling and Transport in Panama: 2003

	Annual Transport Costs for Preschool for Children Under Age 6	Children Age 6 and Older	
		Time to School (min)	Annual Transport Costs for Schooling
All	141.5 (-10.617)	25.3 (-0.355)	151 (-3.047)
Males	137.3 (-14.483)	24.8 (-0.504)	149.1 (-4.753)
Females	145.9 (-16.371)	25.8 (-0.51)	152.6 (-3.987)

NOTE: Standard error in parentheses.

SOURCE: Encuesta de Niveles de Vida, Panama, 2003; calculations by authors.

TABLE 4 Transportation to Schooling Among School Attendees Age 7 or Older in Bosnia and Herzegovina: 2000

	Time to School (min)	Distance (km)	Amount Spent Weekly (KM)
All	35.34 (-1.557)	9.25 (-1.412)	7.79 (-0.847)
Males	33.45 (-1.748)	7.7 (-1.368)	6.31 (-0.684)
Female	37.12 (-2.538)	10.71 (-2.439)	9.2* (-1.516)

NOTE: Standard error in parentheses. Authors' calculations. KM = konvertibilna marka.

*Difference significant at .1 level.

SOURCE: Living Standards Measurement Study, Bosnia and Herzegovina, 2000.

TABLE 5 Enrollment of Girls and Boys in Primary School in Guatemala, by Distance to Nearest Primary School and Type of Road Access: 2000

Distance to Nearest Primary School (km)	Girls (%)	Boys (%)	Total (%)
Paved communities			
<1	79.2	80.4	79.8
1-10	62.2	78.3	71.3
>10	51.3	65.8	59.0
All other communities			
<1	67.5	87.1	75.8
1-10	67.3	65.4	66.3
>10	50.1	56.2	53.2

use, individuals who self-report illness or injury in the time before the survey but who did not seek health care are asked why they did not do so: transport difficulties are options to this question.

The Bosnia and Herzegovina LSMS survey¹⁷ shows that women pay significantly more than men for transport to health care, while in Panama the differences between genders are insignificant (Table 6).¹⁸ No data were collected for Malawi. The Panama data show that there are also no significant differences in men's and

¹⁷ The Bosnia and Herzegovina survey of 2001 collected data on health transport expenditures for all types of services, some for the 4 weeks before the survey and some annually. In other surveys, only transport expenditures for the prior 4 weeks are collected, and typically they are for a specific provider.

¹⁸ This survey does not control for the amount of health care used.

women's transport to health facilities in terms of the average time spent and the type of transport used.

As with LSMS surveys, the DHS ask reasons for nonuse of health care, with distance and lack of transport as options. In the case of the DHS, however, the question refers only to why a woman did not use a health facility for giving birth. A question also lists eight factors that limit the use of health care. Among the eight factors are distance and lack of transport and whether any of these factors is a constraint to health care access. As other factors that inhibit access to health care are also questioned, the surveys allow the issues that affect health care access to be ranked, thus showing the importance of transport. For very specific purposes related to health access, the DHS provide key data on transport but are not an important source of other transport-related information.

The reviews of the core MICS questionnaire show that transport questions are included at the household level with a focus on the types of transport modes owned by the household. However, because each country can customize the core questionnaire, there can be additional questions related to transport in some cases. (The text of example questions used in several countries is shown in Appendix A.) For example, in Thailand in 2005, reasons for not attending school were questioned as well as reasons for not registering children's birth. For both questions, distance and time of travel were options.

Domestic and Household Work

The review of the core MICS questionnaire also shows that the only quasi-individual-level question included relates to who is mainly responsible for fetching water (adult female, adult male, female child, or male child). However, because each country can customize the core questionnaire, there can be additional questions related to transport. Some, but not many, LSMS surveys gather information on who collects water and fuel; the Malawi survey does.

A further area of investigation concerning the MICS is the ability to link household data sets to other data sets in individual countries. The MICS data sets do not include any community-level data that could provide information on access to roads as well as distance to health, education, and other facilities. However, the survey developers recommend that Global Positioning System data be collected as part of the MICS to allow household survey data to be linked to other administrative data sources. It is not clear from the available information how many countries have collected these data, let alone matched them to administrative data sets that would allow more analysis of transportation. Some LSMS surveys are georeferenced and similar analyses could be possible.

TABLE 6 Transport Costs Related to Health in Bosnia and Herzegovina (2001) and Panama (2003)

	Transport Costs		Time to Health Provider, 0- to 5-year-olds (Panama)	Transport to Health Provider (Panama)	
	BH (mean KM)	Panama (balboas)		Walking (%)	Private vehicle (%)
Total		4.63 (0.420)			
Males	5.23*** (0.485)	4.91 (0.692)	32.9 (2.36)	30.9 (2.36)	10.9 (1.68)
Females	7.89*** (0.655)	4.46 (0.531)	30.2 (2.03)	30.8 (2.55)	13.5 (2.07)

NOTE: Bosnia and Herzegovina (BH) collects information on all health related transport spending by type of provider using different reference. For both questions, distance and time of travel were considered as options. Where feasible, MICS are coordinated with the DHS or LSMS surveys. To the extent that this coordination is really an integration of the surveys, there may well be further data on transport available periods. Panama data are for past 30 days. KM = konvertibilna marka. Standard error in parentheses.

***Significant at the .01 level.

SOURCE: BH Living Standards Measurement Study, 2001; Panama Encuesta de Niveles de Vida, 2003.

Quality of Transport

None of the surveys reviewed provided information on the quality or safety of various transportation options, which tend to play an important role in a woman's decision to travel and in her overall mobility.

CONCLUSIONS AND RECOMMENDATIONS

In-depth transportation surveys cannot be replaced by alternative data sources: data needs for assessing how gender and transport interact to affect access and mobility are too great to be covered in multitopic surveys or in those with a specific focus on another topic. None of the surveys reviewed provided information on the quality or safety of various transportation options, which can be important for women's overall mobility. Also, each type of survey serves specific purposes, which are not aimed at transportation planning in particular: the purpose of MICS is to provide indicators that track the Millennium Development Goals and the goals of the World Summit for Children; DHS aim to shed light on fertility decisions and maternal-child health; HBS-IES seek to measure expenditures, and LSMS surveys assess welfare and the factors that affect it. However, much remains to be learned from these surveys and exploiting existing data sets can be useful and cost-effective. In particular, the LSMS surveys reviewed confirmed differences in health and education-related travel: girls are more likely than boys to use public transportation to travel to school; girls and women are more likely to pay significantly more than boys and men for transport to access education and health facilities.

The most relevant data for assessing gender needs and differences in relation to transport access and use are the HBS-IES expenditures on transportation, with some of these surveys collecting data at the individual level. MICS typically include questions at the household level related to modes of transport owned by the household and, in any given country, may collect data on transport use for

accessing education and social and economic activities. Potential linkages with community-level data sets might provide more relevant data but they will still be limited. However, adapting this type of survey for monitoring transport and gender data could have a substantial impact, considering the number of countries in which they are implemented. The LSMS surveys can provide data relevant for the transportation sector in relation to community access to paved and unpaved roads, existence of bus service, and all-weather road access.

Some data on transport affordability can be found in those HBS-IES that include individual diaries of expenditures in addition to the overall household diary. This information can allow an examination of spending by men and women on transportation. In some cases, the surveys may also provide information on the types of transportation being used. The usefulness of the HBS-IES will depend on the level at which expenditures are recorded and entered into the data sets. LSMS surveys also provide expenditure data for some types of trips; however, they are usually limited to education and health facilities.

In terms of household data on travel patterns and trip purposes, MICS can provide occasional information but LSMS surveys provide the most substantive information on transportation and gender that relates to health and education. However, the same questions across surveys do not always exist, thus creating some limitations to cross-country analysis. When individual countries maintain the same questions over time, the surveys can help assess tendencies and linkages between changes in transportation policy and actual use over time. Additional information exists in some surveys on labor-related transportation, what is used, and, in at least one survey, the provision of employer-subsidized transport as well and in others on firewood and water collection, but they are rarer.

DHS questionnaires also provide information on transport use for accessing health care. To the extent that DHS link to other data sources (other surveys or through georeferencing), there may be country-specific opportu-

nities to analyze gender and transport. National statistical systems are increasingly likely to have georeferenced road networks and many countries have administrative data on public transportation, such as routes and costs, that could be linked to the household survey data based on geography.

Four recommendations can be made for improving the surveys reviewed in relation to transport data that focus on gender issues. First, adding more questions could ensure a focus on transport and gender issues. This recommendation is probably most feasible in the LSMS surveys as they are designed to look at the factors that affect welfare and is less feasible in the MICS as they are focused on indicators and not the linkages among the indicators or cause and effect. DHS already include some questions that are relevant for understanding the effect of transport on health care; it appears unlikely that questions related to more general transport use would fit. The IES-HBS provide the most potential for new analysis but only on expenditures.

Second, survey questions could be systematized as much as possible. Among LSMS surveys, the questions vary because of the heavy customization of these surveys to meet country demands for data. Some attention to ensure that questions are similar over time within each country should be simple to implement and comparability

across countries may also be possible. DHS are already quite harmonized in terms of the few transport questions, which facilitates comparisons across time and space.

Third, data on expenditures collected through IES-HBS would be more useful if disaggregated by expenditure, which would increase the costs of data collection, entry, and processing and may not be feasible. However, in some surveys data are collected at the expenditure level but are then aggregated to the category level when the data are entered; providing guidance to countries on the benefits of maintaining the expenditure-level data may be effective in increasing the availability of good expenditure data for men and women.

Finally, before designing a full transportation survey for collecting gender data in a given country, transportation planners and analysts should investigate existing data sources; depending on the country, there may be substantial information that can be gleaned from existing surveys. If a country is planning to implement a survey in the near future, it is worth exploring the possibility of adding critical transport questions to that survey. Statistical offices are often willing to add specific questions to an ongoing survey for a cost that would be well below that of carrying out a dedicated transport survey. Only after these options have been exhausted would it appear to make sense to invest in an in-depth transport survey.

APPENDIX A

Examples of questions from household surveys are shown in Table A-1.

TABLE A-1 Household Survey Questions

LSMS Survey		MICS
<p>Education</p> <p>What is the distance to the kindergarten where [CHILD's NAME] is taken care of?</p> <p>What is the distance between your home and school?</p> <p>How much time does it take to travel to the school where you were attending?</p> <p>How much do you spend for transportation to school each week?</p> <p>What means of transportation did you mainly use from your house to the school or educational center?</p> <p>Bus or taxi..... 1 School bus..... 2 Private car (own or friend's).... 3 Bicycle..... 4 Boat..... 5 Horseback..... 6 On foot..... 7 Other, specify..... 8</p>	<p>Health</p> <p>How much did you pay in money or in kind for transport costs associated with these visits to [HEALTH PROVIDER/ FACILITY]? (<i>question repeated for each provider</i>)</p> <p>During the previous four weeks did you need medical services but did not obtain them?</p> <p>What was the main reason you did not obtain them:</p> <p>Minor disorder, self-treated.... 1 Minor disorder, did not treat. 2 No health insurance..... 3 Too far..... 4 Institution closed..... 5 Poor service..... 6 Too expensive..... 7 Other..... 8</p> <p>In total, how much time did it take to go from your house to the (health provider) location where you were seen?</p> <p>What means of transportation did you use most of the time to go to the (health provider) location where you were seen?</p> <p>On foot..... 1 By horse or other animal..... 2 Boat or motor boat..... 3 Bicycle or motorcycle..... 4 Bus or taxi..... 5 Private or own means..... 6 Ambulance..... 7 Plane, helicopter..... 8 Other, which?..... 9</p>	<p>Water, Health, Registration</p> <p>WS3. How long does it take to go there, get water, and come back?</p> <p>WS4. Who usually goes to this source to fetch the water for your household?</p> <p>Adult woman..... 1 Adult man..... 2 Female child (under 15)..... 3 Male child (under 15)..... 4 Don't know..... 8</p> <p>C10. Does any member of your household own...?</p> <p>Watch Bicycle Motorcycle or scooter Animal-drawn cart Car or truck Boat with motor</p> <p>BR2. If child's birth not registered with civil authorities: Why is ... birth not registered?</p> <p>Costs too much..... 1 Must travel too far..... 2 Didn't know it should be registered..... 3 Don't want to pay fine..... 4 Don't know where to register..... 5 Other..... 6 Don't know..... 8</p>
<p>Labor and Time Use</p> <p>In this job did you receive free transportation or money for transport to your work?</p> <p>How much did you receive last month?</p> <p>If you had to pay for the transport, how much would you spend a month?</p> <p>What means of transport do [YOU] mainly use to go to your job?</p> <p>Public services (bus, taxi)..... 1 Own or friend's car..... 2 Transport from business..... 3 Bicycle or motorcycle..... 4 Boat..... 5 Horse or other animal..... 6 Other private..... 7 Don't use (walk)..... 8</p>		<p>HBS</p> <p>Expenditures for</p> <p>Bus (local, long distance) Alternative transport (unlicensed motorcycle, van, and car taxis) Taxi Subway, train Boat Airboat Ferry boat Gasoline, alcohol fuel, diesel Parking Tolls Transfers (bus-subway-train)</p>

SOURCE: LSMS questions from Bosnia and Herzegovina 2001 and Panama 2003 questionnaires; MICS questions from Thailand 2006 questionnaire; HBS questions from POF, Brazilian Institute of Geography and Statistics 2003.

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