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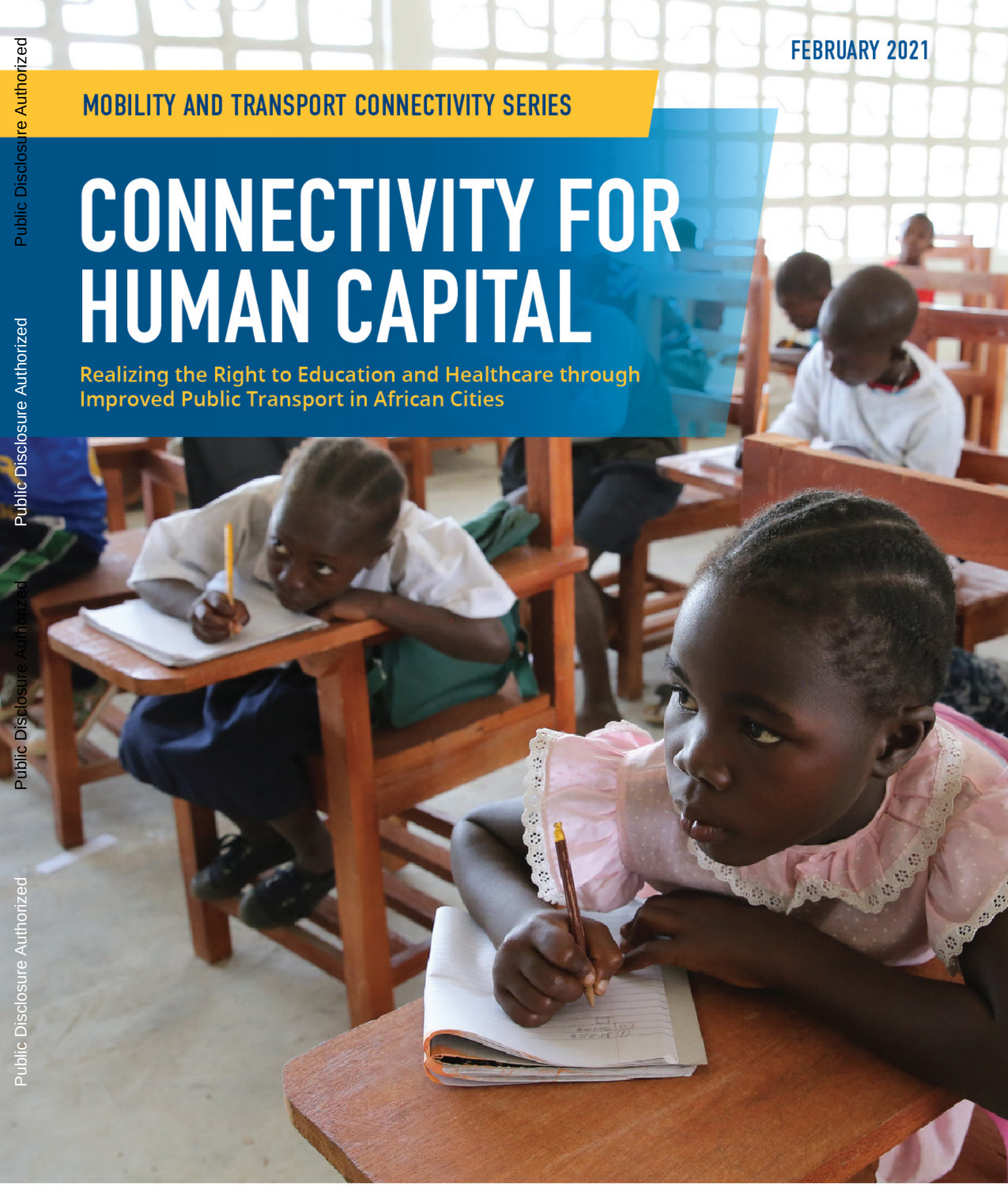
Realizing the Right to Education and Healthcare through Improved Public Transport in African Cities



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Acronyms

ACHPR	African Charter on Human and People's Rights
ACPHR	African Commission on Human and People's Rights
ARV	Antiretroviral
BRT	Bus Rapid Transit
CBD	central business district
CEDAW	Convention on the Elimination of Discrimination Against Women
CFA	West African Franc
CMOC	Comprehensive Obstetric Care facility
CRC	Convention on the Rights of the Child
CREDD	Strategic Framework for Economic Recovery and Sustainable Development (Mali)
CRPD	Convention on the Rights of Persons with Disabilities
CSCOM	Community Health Centers (Mali)
CSPS	Community Health and Social Center (Burkina Faso)
CSREF	Referral Health Centers (Mali)
END	National Development Strategy (Mozambique)
FYDP	Five Year Development Plan (Tanzania)
GKMA	Greater Kampala Metropolitan Area
GMA	Greater Maputo Area
GTFS	General Transit Feed Specification
HIV	Human immunodeficiency virus
ICCPR	International Covenant on Civil and Political Rights
ICESR	International Covenant on Economic, Social, and Cultural Rights
IDP	internally displaced person
JNA	Joint Needs Assessment (Zimbabwe)
LGBTI	Lesbian, gay, bisexual, transgender, and intersex
LMIC	Low- and middle-income countries
MICS	Multiple Indicator Cluster Survey
NMT	Non-motorized transport
NST	National Strategy for Transformation (Rwanda)
NTP	National Transport and Road Infrastructure Policy (Mali)
NUP	National Urbanization Policy (Rwanda)
OHCHR	Office of the United Nations High Commissioner for Human Rights
OSM	Open Street Maps
RWF	Rwandan Franc
SDG	Sustainable Development Goals
SOCATUR	Société Camerounaise des Transports Urbains
SOTRACO	Société de Transport en Commun de Ouagadougou
SOTRAMA	Société des Transports du Mali
SSA	Sub-Saharan Africa
UN	United Nations
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UPR	Universal Periodic Review

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Executive Summary

Despite having made tremendous progress in ensuring equal access to education and healthcare for its people, with school enrollment rates rising and children in most countries receiving the recommended preventative care, **many countries in Sub-Saharan Africa (SSA) remain at the bottom of the World Bank's Human Capital Index and the United Nations (UN) Human Development Index.** The existing data also suggests that women are being overlooked in the drive to develop human capital, and only slightly over half of all primary school students continue schooling until last grade. Issues of access loom large; millions of children are not in school at all.

The past two decades have witnessed a large and growing policy and academic interest in the social implications of transport planning alongside the traditionally well-studied economic and environmental outcomes (Lucas, 2012). It is generally accepted that access to healthcare is an important determinant of health status (Probst *et al*., 2007). Intuitively, transportation barriers lead to rescheduled or missed appointments, delayed care, and missed or delayed medication use; these consequences may lead to poorer management of chronic illness and thus poorer health outcomes. **Overall, the global evidence to date supports that transportation barriers are an important barrier to healthcare access, particularly for those with lower incomes or the under/uninsured.** Poor physical access to health facilities also in developing countries has been identified as an important contributor to reduced uptake of preventive health services, likely more so in low-income settings. Variable uptake of available health interventions in SSA has been found to undermine healthcare programs and to play an important role in child and maternal mortality (Rutherford *et al*., 2010).

Empirical evidence is not conclusive about the main factors affecting student achievement (Asahi, 2014), and researchers in the education field have typically focused on traditional schooling inputs such as teaching quality (see, e.g., Rockoff, 2004) or class size (Krueger & Whitmore, 2001). However, **a few studies have explored the impact of school accessibility on intermediate education outcomes, finding evidence that it is positive and especially so for the children on the edge of failing:** Dickerson & McIntosh (2013) found that shorter distance between the students' home and their closest school is positively related with the probability that mediocre students continue into post-compulsory education; Falch *et al*. (2013) concluded that reduced commuting time has a positive effect on graduation from upper secondary schools, and this effect is larger for students with low academic achievement.

The development of transport networks has the potential to lift people out of poverty in urban areas across the developing world and contribute to the fulfillment of their equal Rights to Education and Health. Developing regions and in particular SSA are rapidly urbanizing, which means that the supply of transport services has to increasingly play catch-up with demand. This challenge is further magnified by the form in which the growing urban areas are developing, some seeing rapidly declining densities from the immediate cores, which makes the provision of affordable transport services unfeasible. Therefore, in the race to close the remaining human development gaps, through improved access of children to schools and of vulnerable population groups to essential care, transport connectivity must be closely coordinated with strategic interventions in overall urban development and, particularly, the planning of housing and the facilities that provide schooling and health services. Moreover, the physical *availability* of school

facilities and clinics and *accessibility* to them must be accompanied by the schooling and care being *affordable* as well as *appropriate* for all, implying that the education and health services provided should be of high enough quality also for the most marginalized of people.

This study aims to shine light on the extent to which the national level commitments to ensuring education and health for all are reflected in concrete transport, education, and health sector policies and targets at the country and city level and, in turn, whether the reality on the ground in some of the major urbanized areas in SSA is one of equal and adequate access. Focusing on ten large cities across SSA and applying not only spatial modeling tools but also policy and survey analysis and insights from interviews with human rights and development practitioners working in the region, the study provides new evidence on the degree to which health and education opportunities can be physically reached using the existing fixed-route public transport systems. In doing so, it also identifies who is being left behind – both across the urban space as well as across different dimensions of marginalization such as poverty, disability, gender, or their intersection. Because of the focus on public transport modes – mostly buses and minibuses – and walking, the results should therefore be interpreted as relevant for most, but not all, of the city populations, as accessibility by private cars or motorcycles is likely be higher although will certainly come up against congestion constraints if all or even most people were to rely on these modes. Recognizing that the use of health services and ability to meaningfully take advantage of education opportunities may be only partly driven by physical access barriers, the study also highlights the broader constraints faced by certain marginalized groups.

Awareness of the role of transport connectivity and improved transport and land use planning coordination in facilitating access to essential services is noted in nearly all of the Government-level – both national and city-specific – policy documents and future strategies. At the same time, the differentiated education and healthcare access needs of the more vulnerable society groups – and targeted strategies on how to serve them – have received less attention, and the definition of sector-specific goals is not commonly informed by analysis of the existing *spatial* patterns of exclusion.

This may explain why public transport connectivity to advanced healthcare facilities in particular remains low in some of the cities. Analysis of the existing and new household data suggests that transport availability and distances that have to be traveled rank among the main constraints for households to bring their children to school and for people, including specifically women in child-bearing age, to travel to healthcare facilities. This is consistent with findings from the spatial modeling undertaken in this study, which shows that average travel times by public transport to the nearest advanced health facility exceed half an hour in three of the ten cities (Harare, Bamako, and Ouagadougou), and reach nearly an hour in the latter. Average travel times to schools are lower, although are consistently higher for secondary schools than primary ones, reaching nearly half an hour in Harare. When compared to traveling to schools on foot, the existing public transport systems appear to offer variable degrees of "value-added", depending on the city: the average travel time to the nearest primary school in Maputo is nearly half an hour longer on foot than by public transport, while in the other cities the difference in average travel time is only a few minutes or none.

Mixed-use environments and transit-oriented development promote density around corridors and allow more people to be connected to

opportunities more quickly. And, to develop effective policies to improve accessibility, understanding what drives performance – transport or land use – is crucial. In other words, how accessible are health and education opportunities in a city is a product of the efficiency of the transport system itself and the city's land use patterns – the extent to which the city's development is "transit-oriented", with higher population densities near transit routes, and the degree to which its land use is mixed in the sense that health and education facilities are locally available in the areas densely inhabited by people. The overall extent of the city, its compactness or sprawl, and the average population densities will also determine if key social services can be made directly accessible for all, given the elevated costs of doing so in sparsely populated, outlying areas.

In the ten cities in scope of this study, average travel times to the nearest primary school are closely correlated with key land use planning indicators. As might be expected, the correlation is the strongest with the share of the city population living within walking distance (1 km) of a primary school: the cities with more mixed land use have distinctly lower average travel times to the nearest school. The relationship is also quite distinct with respect to the average population size per primary school: average travel times are lowest in cities like Conakry, Douala, and Ouagadougou, where a primary school exists per every couple of thousand inhabitants, and they are the highest in cities like Harare and Maputo where population per primary school exceeds 12,000. Finally, the overall average population density of a city is also quite closely correlated with how long an average city resident has to travel by public transport to reach the nearest primary school: average travel times increase as population densities decline, with the average residents of the denser cities like Conakry, Douala, and Nairobi seeing distinctly lower travel times.

In contrast, the average travel times to the nearest primary school do not vary as distinctly with any of the two variables that characterize the extent to which the city development is transit-oriented – the share of population living within walking distance of transit and the share of primary schools located within walking distance of transit. This may be explained by the fact that in cities like Ouagadougou and Conakry, where, mostly due to the sparsity of the public transport networks, a low share of people live directly near transit and where a comparatively lower share of primary schools are directly near transit, these transport deficiencies are offset by a larger number of primary schools per capita and by the wide presence of primary schools directly within residential neighborhoods. However, this might also be at least partly due to the technical performance (slow speeds, long headways) of the public transport services, which reduce the value of being near a public transport route in some cities (e.g., Ouagadougou), and the sheer distances that have to be traveled in yet others (Harare, Maputo). Finally, the fact that population proximity to transport doesn't appear to translate into better primary school access may have to do with the way informal transport routes – which dominate many of the cities in scope – are allocating themselves. As also noted by the interviewed development practitioners, the informal transporters likely prioritize routes that are profitable, such as those used for daily commuting to jobs and major economic activity centers.

In the case of accessibility to secondary schools, the overall correlation patterns with transport and land use planning characteristics are similar although the magnitudes are lower. The correlation remains by far the strongest with the share of population living within a walking distance to a secondary school - i.e., the direct presence of secondary schools within residentially dense neighborhoods.

Accessibility to advanced healthcare facilities stands out as being comparatively more highly correlated with at least one transit-oriented development indicator – the share of people living within walking distance of transit. Thus, average travel times to nearest facility are among the lowest in cities like Kampala, Douala, and Nairobi, where the vast majority of residents live near at least one public transport route, and it is by far the highest in Ouagadougou, where less than half of the population can reach a bus route within a 1-km radius from home. This might be indicative of the "value added" of public transport services specifically for reaching these types of facilities; however, it could also be just a spurious correlation, in that the same cities in which many people live near transit also have wider availability of advanced healthcare facilities per population. Also accessibility to advanced healthcare facilities, similarly to accessibility to schools, remains the most strongly related to the direct presence of healthcare facilities within residential neighborhoods: travel times are distinctly higher in Ouagadougou, Harare, and Bamako, where only between 7 and 12 percent of the urban residents live directly near an advanced health facility, and by far the lowest in Kampala, Douala, and Conakry, where over 80 percent do.

Despite acceptable *average* accessibility as measured by travel time to the nearest facility, the spatial analysis suggests that there is sometimes significant spatial inequality within the cities, with at least several percent of the city populations facing extremely long travel times, or "accessibility poverty." If assuming an acceptable one-way travel time by public transport of half an hour for primary school children, the share of those who are characterized by accessibility poverty ranges from a few percent in Conakry and Nairobi, to over 15 percent in Harare and Maputo; only in Douala all children are within half-an-hour of at least one primary school. In the case of secondary schools, travel times in excess of half an hour each way are incurred (assuming use of public transport) by approximately the same share of people in each city except for Harare, where the share of accessibility-poor people in this case is much higher. In the case of advanced healthcare facilities, assuming a one-way travel time threshold of an hour as being acceptable, in four of the cities – Kampala, Douala, Nairobi, and Conakry – accessibility is universal; in contrast, nearly one in four residents of Ouagadougou is accessibility-poor.

Because of the spatial patterns of cities, in which the poor and precarious neighborhoods are sometimes located on their outer edges, across all the cities for which detailed poverty maps were available or could be constructed, the poor populations are estimated to incur somewhat higher travel times not only to the nearest facility of a specific type but also to the nearest public facility specifically. For example, the average residents of Kigali and Ouagadougou have to travel for 17 and 57 minutes, respectively, to reach the nearest advanced healthcare facility, while the average poor residents of these cities incur travel times of 27 minutes and 65 minutes.

While alleviating physical accessibility constraints is likely a necessary condition, it is not a sufficient one. **Accessibility inequality in many of the cities stems from marginalization along several dimensions, including not only physical access.** In particular, the range of services and medication available in the facilities vary by geographical location, and typically one needs to travel for higher quality or higher complexity treatments. Thus, even in areas where physical access appears to exist, some groups have limited access to health services in practice, or there are supply-side factors – such as limited staffing or resources (e.g., medications) available, or long wait times and crowding – impeding access to schooling or healthcare in practice. The actual use of specific health facilities and schools

is also driven by the subjective perceptions of quality, whereby in some cities people prefer to travel to the less physically accessible hospitals while foregoing the more nearby located medical centers or clinics.

To provide a richer perspective on the variety of constraints faced by specific marginalized groups in accessing needed care and schooling, the study team conducted a series of semi-structured interviews with key staff from human rights and development organizations working in the countries in scope of the study. As suggested by these interviews, **the extent to which transport infrastructure and services represent a critical barrier to accessing health services is yet more intensified for women due to a combination of constraints related to gender norms, economic dependence, and transport availability**. Similarly, even in areas where physical access exists, some groups have limited access to health services in practice, such as due to limited affordability of the health service itself and the time costs associated with the long wait times to receive care.

Equality in access to education was noted to be affected by physical access and transport gaps; inequality in quality; affordability; and the exclusion of specific groups, such as children living in city peripheries and informal settlements, "street" children, and children with disabilities; and gender norms that prioritize boys' education over girls' and impose heavier household chore duties on women and girls. The interviews also highlighted sexual harassment and gender-based violence in public transport and while walking to or from school as key constraints for girls' education in particular.

The appropriateness of mobility systems for people with disabilities was noted as a barrier for accessing healthcare in several countries. For example, blind people are reportedly not able to move independently because of the lack of appropriate transport; this, in turn, particularly excludes blind people with lower incomes who cannot afford a guide. Similarly, access to healthcare by the elderly population is reportedly restricted due to mobility constraints related to transport affordability and lack of social support. Inadequate transport infrastructure was noted to represent a barrier for gender-based violence survivors to access care services. Poor pedestrian infrastructure – which is the main infrastructure children rely on to reach schools across all the cities in scope of this study – was noted to limit walkability, disproportionately affecting children with disabilities.

Policy recommendation related to these findings need to be tailored to the specific city context – most notably, distinguishing between the need for fundamental accessibility improvements and more limited interventions to address specific spatial gaps or marginalization-based constraints. Lower-hanging fruit interventions include regular, disaggregated, sub-city data collection at the level of the transport user; strategic land use preservation by city governments anticipating future facility needs; improvements of transport infrastructure, notably pedestrian and cycling infrastructure that matters tremendously for accessing schools in particular; innovative schemes to serve lower or less predictable demand destinations through on-demand services; and the improvement of the transport planning process to ensure that the voices or the more marginalized transport users are equally heard. Longer-term but potentially higher payoff interventions include improvements in the metropolitan-scale transport and land use planning coordination, including to ensure transit-oriented development and transit access to essential services facilities; reforms of the existing – often informal – public transport services; and addressing the supply-side gaps in health and education, most notably the quality of service issues in public facilities.

1. Introduction

Over the past three decades, the number of children living in urban settings has increased by nearly a quarter, leading to concerns about available opportunities and services in cities. Globally, 43 percent of children lived in cities in 1989, compared with nearly 55 percent today. The increase has been among the fastest in Africa, where nearly one half of children now live in cities, compared with less than one third in 1989 (UNICEF, 2019).

In general, urban dwellers are better off than their rural peers. They enjoy higher incomes and levels of education, have access to more and better job opportunities and markets, and benefit from better infrastructure and services. These benefits have long been understood as conferring an 'urban advantage' on people who live in cities, including children. A closer look at the evidence reveals fissures in the urban advantage narrative, however. In reality, a considerable share of children in urban areas have been left behind, living in pockets of poverty and deprivation. Analysis by international development organizations has identified enormous inequalities in urban areas, with children from households in the richest quintile enjoying a large advantage on every indicator – such as education, immunization, and overall mortality – over children from households in the poorest quintile. The large advantage of wealthier urban households pulls up the averages for all children who live in cities, giving the impression that they are better off than their rural peers. This effect is especially pronounced in cities and towns with large slums and many children living in the streets.

Over the next 50 years, Africa will be the continent with the largest cohort of primary and lower-secondary-school-age children in the world – 40 percent of the global total. Already today, the populations of most African countries are overwhelmingly young, with half or more of the residents aged 15 or less (e.g., SSATP, 2018a). There is preliminary evidence that even in the context of low-quality primary education, being in school matters: in Sierra Leone, for instance, a Multiple Indicator Cluster Survey (MICS) literacy and numeracy module showed that children between the ages of 7 and 14 still had better foundational skills than their out-of-school peers even if they were receiving low-quality instruction. Reaching the remaining primary-school-age children who are out of school globally will require different strategies than the international community has deployed in the past – and a keener focus on equity. The children who remain out of school today are typically among the most marginalized, impoverished, disadvantaged and hard to reach. In some cities, sprawling unplanned urbanization has reduced the proximity of many impoverished and marginalized urban households to essential services. The quality of services on the urban periphery is often poor; in some slum areas, services may not even exist.

The Right to Education is defined as one of the fundamental human rights in the Universal Declaration of Human Rights, as is the Right to Equality – a concept that is multi-faceted and encompasses equality in access to all life quality enhancing opportunities such as education and healthcare. The right of everyone to enjoy the highest attainable standard of health and the right of everyone to education are also recognized in the International Covenant on Economic, Social and Cultural Rights. Interpreted in practice, the realization of these rights requires that conditions are put in place that assure to all members of society that medical services can be accessed in the event of sickness; and that primary and secondary education are made both available *and* accessible to all.

Agenda 2030 for Sustainable Development, similarly, is grounded in the commitment to leave no one behind and recognizes that there is a need to operationalize human rights in development work. Universal access

in urban areas is embodied in two targets of the Sustainable Development Goals (SDG): 9.1 and 11.2. The first of these aims to develop infrastructure to support economic development and human well-being, while the second aspires to provide sustainable transport systems for all, with a focus on public transport. Finally, the Habitat III New Urban Agenda underlines the need for accessible cities, and focuses on equal access to all services, including transport. It stresses "age and gender-responsive planning and investment for sustainable, safe, and accessible urban mobility for all", and supports a focus on the needs of marginalized groups (Mason *et al*., 2017).

The Sub-Saharan Africa (SSA) region has made tremendous progress in ensuring equal access to education and healthcare for its people. Schooling has expanded almost universally in the past decade, with the gross primary enrollment rate rising from 68% in the 1970s to above 100% in 2010. Moreover, as noted by the recent World Development Report on learning, previously marginalized groups, especially girls, are now much more likely to start primary school (World Bank, 2018).

Nevertheless, the region continues to lag behind other parts of the world. Most African countries rank in the bottom of the World Bank's Human Capital Index and the United Nations (UN) Human Development Index. The existing data also suggests that women are being overlooked in the drive to develop human capital. Only 55 percent of primary school students remain until last grade, and only 79 percent of young (15-24 y/o) males and 72 percent of young females in SSA are literate. Africa has the largest return on education of any continent, with each additional year of schooling raising earnings by 11% for boys and 14% for girls. But issues of access loom large; about 50 million children are not in school at all. Differences in access to schooling lead to impacts that persist for several generations.

The stark human development gaps contribute to SSA remaining the world's poorest and most unequal region in terms of income: it is home to 8 of the 10 most unequal countries in the world, as measured by the Gini coefficient. Importantly, SSA is also the fastest urbanizing region in the world, and most large cities in SSA are growing at annual rates exceeding 5 percent. Importantly, urbanization in Africa is occurring at a lower level of income than other regions, with implications on the region's ability to develop efficient and sustainable urban systems. With rapid urbanization, also poverty and unequal access to schooling and healthcare are becoming increasingly urban issues; solving them requires robust evidence on the full set of constraints that prevent the poor and the marginalized from realizing their rights to education and healthcare and ensuring decent quality of life.

With Africa's rapid urbanization, urban transport connectivity is becoming central to equal physical access to education and healthcare. Public transport serves most motorized travel in SSA cities today but is often inefficient or not reachable for certain socioeconomic groups such as women and the poor. Transport consumes around 40 percent of income of the poorest urban households, leaving less for education, health, and other basic needs. In individual countries, expenditures on travel to schools have been found to be on par with those on school fees, while travel to medical centers costs double the medical cost. The existing evidence points to stark inequalities in the coverage of public transport services within the cities, with people in the poorer neighborhoods depending on walking for most of their trips.

National and city governments in SSA are starting to recognize the importance of ensuring urban mobility for all by improving the existing public transport systems and have called for World Bank's assistance to

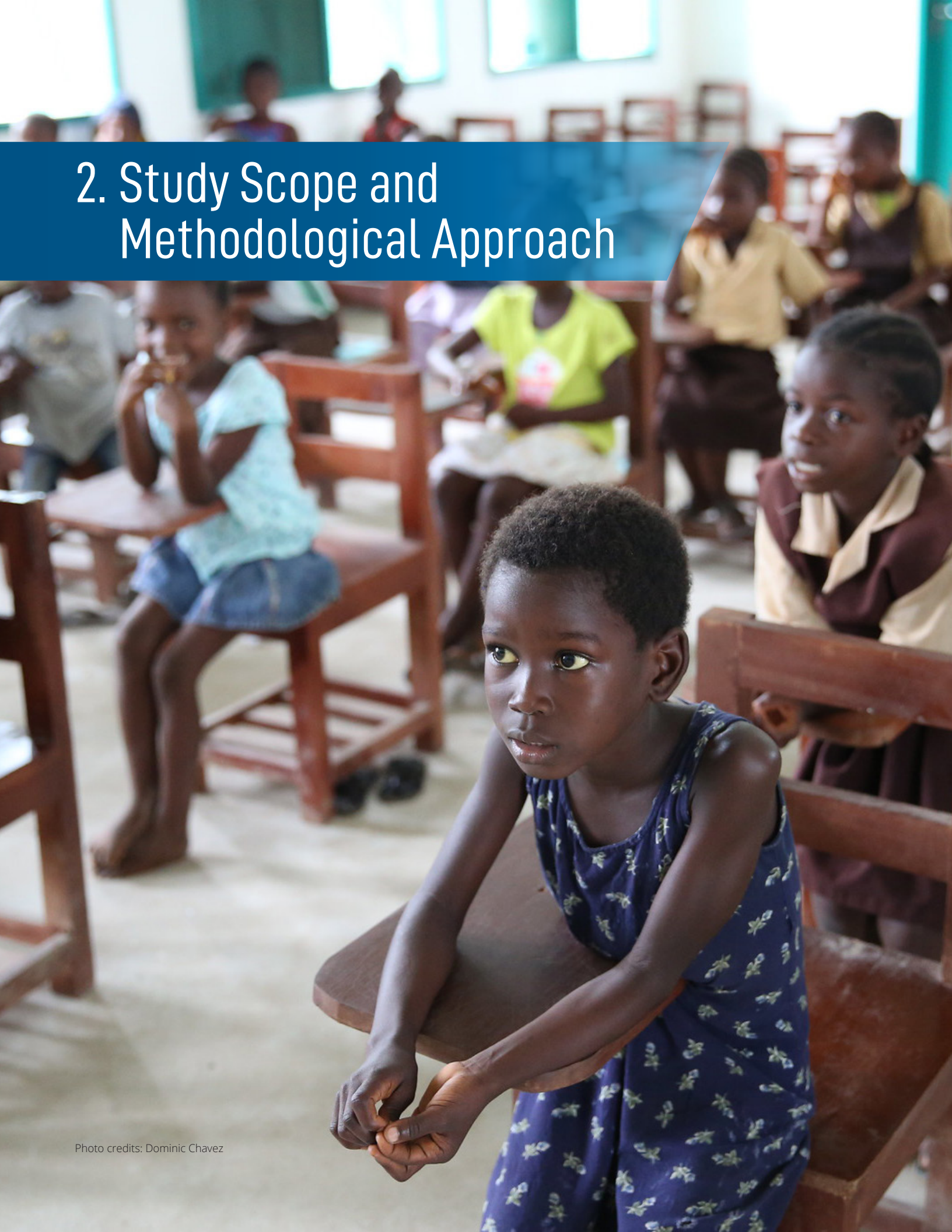
do so. Over the past few years, Bus Rapid Transit (BRT) projects have been put in place or are starting to be planned with World Bank financing in Dar es Salaam, Dakar, Abidjan, and Douala, with several other cities, such as Ouagadougou and Kigali, considering similar solutions. A departure from past practice is also the growing aspiration of the World Bank's Transport Global Practice to help the client governments design public transport systems in a way that measurably contributes to human capital objectives and allows reducing spatial and socio-demographic divides in accessibility to opportunity.

Transport connectivity and human capital indicators in SSA are highly correlated at the country level; for example, there are strong correlations between a country's Rural Access Index – or the share of the rural population living within 2 km of an all-season road – and adult literacy, primary school completion rates, and maternal mortality ratios. Comparatively much less complete is our knowledge of the level of accessibility – and the inequality in accessibility across space and across socio-demographic groups – that exists within SSA's rapidly growing cities. A more fine-grained understanding of gaps in physical accessibility to schools and health centers and their linkages to gaps in actual health and education outcomes is needed to better plan and target physical connectivity investments and policies, including public transport improvements and fare subsidy programs. With the growing pipeline of BRT and similar projects in the region, each requiring upfront financing of between US$150 and US$300 million, such an understanding is imperative for maximizing the World Bank's impact in terms of human capital outcomes and the realization of the equal rights to education and healthcare.

The World Bank's twin goals of reducing poverty and boosting shared prosperity imply the need to better target development interventions to ensure that the most marginalized groups of the population have an opportunity to equally participate in economic development. The Human Capital Project is an effort to accelerate the accumulation of human capital by encouraging more effective policies and investments. Progress on the ground, however, requires political leadership and action in key areas, such as committing to equity and inclusiveness. Generating empirical, cross-sectoral evidence and disaggregated data on the existing inequalities and on who is being left behind and why is a step towards boosting such leadership.

The current study aims to contribute to this important agenda by generating knowledge on the state of inequality – across space and across urban citizens characterized by different types of marginalization – in accessibility to health and education services in ten large African cities. The analytical outputs aim to ultimately inform the design of urban transport operations that are sufficiently tailored to realize the rights to education and healthcare by marginalized groups, with the intended long-term outcomes of improved development effectiveness and overall more streamlined reflection of the equal rights to education and healthcare in the international development organizations' transport sector country engagements.

2. Study Scope and Methodological Approach



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The study adopts an inherently cross-disciplinary and mixed-methods approach to start to build a knowledge base on the spatial and socio-economic group specific accessibility inequalities in the selected cities. These include several from each African sub-region: Kigali, Nairobi, Dar es Salaam, and Kampala in East Africa; Harare and Maputo in Southern Africa; and Douala, Bamako, Conakry, and Ouagadougou in West and Central Africa.

The study addresses the following key questions:

1. How well do the existing public transport systems in SSA's cities connect people to education and health-care opportunities? What are the drivers of inequality in accessibility *across* the cities – is inequality mostly explained by the characteristics of the public transport systems, or, rather, other factors such as degree of transit-oriented development or mixed-use planning?

2. Who is being left behind? Are there spatial and socio-demographic (gender or income-based) inequalities in accessibility *within* each city?

3. What are the constraints to accessibility specific to women and girls, the poor, or to people who experience multiple grounds of marginalization? What other barriers besides transport connectivity – such as cultural norms, lack of security in public transport – prevent certain groups in the society from accessing health and education services, and how important are these compared to transport connectivity challenges?

4. What are the linkages between inequality in the physical accessibility to schools and health centers and actual education and health behaviors and intermediate outcomes, as revealed by the global evidence to date?

Accessibility-Human Capital linkages: The study sets out by providing an overview of the importance of improved physical accessibility to education and health-care facilities, as revealed by a comprehensive review of the existing published literature.

Human rights commitments & transport policy goals: Next, we review the commitments the countries in scope of the study have made with respect to providing universal access to health and education. In addition, we summarize the city-specific and national policy goals – to the extent that such goals have been defined at all – in the urban transport sector with respect to physical accessibility to health and education opportunities for all, and the strategic goals regarding health and education outcomes defined in the country and city specific health and education sector plans.

Data assembly and mapping: The study geo-located health and education facilities (hospitals, clinics, primary and secondary schools) in each of the cities, through assembly of existing spatial datasets via collaboration with the World Bank's Health and Education Global Practices. Characteristics of interest include the level of care or education provided (for instance, availability of emergency obstetric care) and the private versus public status. For each city, population distribution data were mapped at a fine spatial resolution, overlaying the locations of health facilities and schools and the public transport network geo-spatial data. Poverty data at various spatial resolutions, depending on the city, was obtained with technical input from the World Bank's Poverty Global Practice. Original poverty analysis and mapping using existing Census and nighttime lights data was undertaken for several cities where such maps did not yet exist.

Accessibility analysis: Using the mapped spatial data of schools and health facilities, the study used spatial modeling tools to estimate physical accessibility to schools and health facilities, by type, comparing across the cities. The analysis also disaggregated results for the overall city population versus the poor population, where possible, and analyzed the within-city inequality in accessibility. To better understand the drivers of varying accessibility across the cities, the study derived a number of different transport and land use planning indicators, such as the degree to which each city's development can be characterized as "transit-oriented" and the presence of schools and healthcare facilities directly within residentially dense neighborhoods (i.e., land use that is "mixed" rather than segregated).

Modeling public transport accessibility has a long history with a trend towards increasingly sophisticated measurements; several types of indicators of public transport accessibility can be identified (Fransen *et al*., 2015). The first type measures the physical accessibility to the public transport system in terms of the proximity of people to transit. A second type of indicator additionally accounts for the technical characteristics of the public transport systems. Third, in addition to physical accessibility to the transit system and the level of service offered by the system, some indicators account for the time or cost associated with the journey to the considered destinations. In this approach, a routable transportation network is constructed, increasingly relying on General Transit Feed Specification (GTFS) data,[1] whereby travel time analysis to destinations such as schools and hospitals can be conducted by considering published timetables based on average travel speeds of public transport vehicles. The current study applies all these metrics to gain a better understanding of the drivers of accessibility inequality across cities.

A broader perspective on access constraints: A limitation of the transport system accessibility approach is its aggregate nature, which can establish general spatial patterns of access but does not provide detailed information on how specific segments of the population have experienced the system (Delmelle & Casas, 2012). To complement the "spatial lens" on accessibility inequality, the study adopts a complementary "categories lens": through analysis of existing household travel survey data and semi-structured interviews with international human rights and development organizations working in the countries covered by the study, the study uncovers the transport-related barriers to education and health access faced by specific marginalized groups, such as women, girls, the poor, and the disabled, and presents them in the broader suite of challenges these groups have to overcome to be able to realize their Rights to Health and Education.

1 Other recent studies that have applied GTFS data to estimate transit travel times at different times of the day include Farber *et al*. (2014) for accessibility to supermarkets, Peralta-Quiros *et al*. (2019), Ma & Jan-Knaap (2014), and Owen & Levinson (2014) for accessibility to employment, and Fransen *et al*. (2015) to hospitals, supermarkets, and daycare centers.

3. Linkages Between Accessibility and Education & Health Outcomes: The Existing Evidence

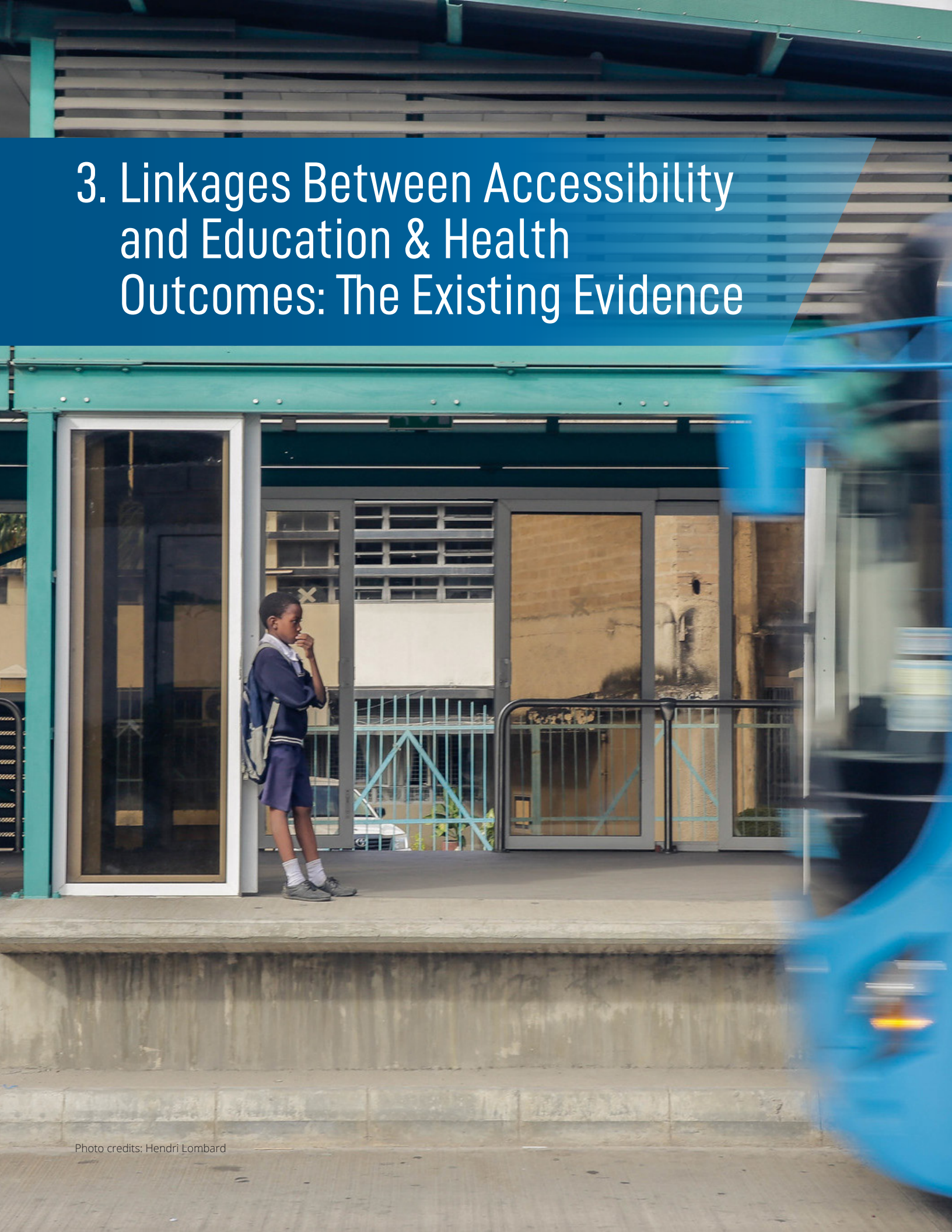

Photo credits: Hendri Lombard

Good transportation allows people to reach a high number of destinations within a certain threshold, or reduce their travel time to preferred destinations (Foth *et al*., 2013). "Spatial accessibility" is one of the most commonly used terms in the transportation geography literature (Delmelle & Casas, 2012), being a measure of the ease of traveling from an origin to a destination via a given mode of transport (Guagliardo, 2004). Authors such as Martens (2012) and Martens *et al*. (2012), among others, have argued that access or accessibility is the most appropriate measure of benefits from transportation plans and investments, and thus should be the focus of any effort to understand and measure the impacts of transportation investment programs. In the same way, Kevin Lynch (1981), one of the top thinkers on cities and urbanism, considers access to be both the reason cities have flourished and the metric by which they are judged. In planning vernacular, access is generally taken to be a function of the number and quality of activities that can be reached given a set of temporal, monetary, social, cultural, technological and physical constraints (see Hanson & Schwab, 1995). Such constraints can include poor knowledge of opportunities, limited financial means, and physical separation from opportunities and a lack of the transportation resources that enable people to overcome that physical separation (Morris, 2011). However, despite a prolific literature on accessibility studies, focus on cities in developing countries has been limited (Kneeling, 2008).

The past two decades have witnessed a large and growing academic and policy interest in the social implications of transport planning alongside the traditionally well-studied economic and environmental outcomes (Lucas, 2012). Accessibility may be measured in many ways (see Geurs & van Wee, 2004, for a thorough review of accessibility measures). However, much of the empirical work to date has explored these connections by examining social disparities in access to the public transit system rather than by the transit system. There are exceptions, however, such as the comprehensive study of the Bay Area, California, by the Transportation for Healthy Communities Collaborative (2002, p.22), which measured accessibility to healthcare facilities by public transport, defining "Transit-Accessible" facilities as those which can be reached by a 30-minute transit trip or a half mile walk. While indicators such as the spatial coverage of walk catchments around public transport stops are insightful in identifying socio-spatial differences in access to the public transport system (thus revealing ***how well transport planning is coordinated with land-use planning***), they do not provide much insight into whether the system brings people to desired activity locations within an acceptable travel time (i.e., ***the quality of the transport system itself***), and they ignore that inadequate proximity to public transport provision can be compensated by local availability of amenities (i.e., ***mixed use neighborhoods***). In other words, providing access to the transport system itself is an important first step; however, if the system does not enable residents to reach essential activities or opportunities throughout the city, its objectives will not have been met (Delmelle & Casas, 2012). Similarly, measures such as the supply of healthcare options within a certain geographic area can lose validity in congested urban areas (Guagliardo, 2004) where getting to even nearby located facilities may be difficult.

The concept of spatial accessibility in health and education matters because schooling and health outcomes are determined by more than just the availability and quality of healthcare and schooling. They also directly depend on factors such as whether teachers report for work (Filmer, 2003). On the so-called "demand side" of education and healthcare, benefits and costs determine how much an individual invests in education or health. Costs include both direct and indirect; among the former, user fees, textbook fees, drug costs but

also transport costs are likely to be the most important. There is a wide range of downstream outcomes of good physical accessibility to health and education facilities, among others, on the demand side, student school enrollment and attendance, patient usage of medical centers, regularity of anti-natal visits; and, on the supply side, provision of medical and school supplies and retention of medical professionals and teachers (lower staff turnover). Morris (2011) posits that inadequate access will lead to suboptimal life outcomes in a large number of spheres. These include, in health, poor knowledge of healthcare options, a constrained health care facility choice set (substandard care might have to be accepted), and needed appointments may be foregone; and, in education, less opportunity to access educational facilities, trips to desired educational opportunities must be foregone, travel time crowds out education time, and education trips are more onerous, physically and temporally. Inaccessible services raise the effective price of healthcare and schooling, which results in higher mortality and lower educational achievement (Filmer, 2003).

Health

Transportation is linked to health through the concept of access. It is generally accepted that access to health care is an important determinant of health status (Probst *et al*., 2007). Primary care is recognized as the most important form of healthcare for maintaining population health because it is relatively inexpensive, can be more easily delivered than specialty and inpatient care, and if properly distributed it is most effective in preventing disease progression on a large scale (Guagliardo, 2004).

In health policy, including in developing countries, there is increasing pressure to tackle the wider social determinants of health and health inequalities through the implementation of appropriate interventions. What is needed is evidence about which interventions are effective and for whom (Bambra *et al*., 2009). Evidence-based and replicable spatial indicators relevant to transport policy are needed to monitor pathways for health behaviors and outcomes and inform planning in this field (Badland *et al*., 2015).

Penchansky & Thomas (1981) described access in five dimensions: availability, accessibility, accommodation, affordability, and acceptability, where the latter three do not relate to spatial relationships but rather reflect healthcare financing arrangements and cultural factors. Guagliardo (2004) proposed two main spatial dimensions of access – *spatial* accessibility (availability and accessibility in a geographic sense) and *aspatial* accessibility (dependent on social class, income, ethnicity, age, sex, etc.) – and delineated four categories of spatial accessibility measurements: provider-to-population ratios (the so-called *regional availability* approach), distances to the nearest provider, average travel impedance to a provider, and gravity models. Similarly, Khan (1992) classified access to healthcare according to two dichotomous dimensions: potential versus revealed, and spatial versus aspatial. Badland *et al*. (2015) proposed a conceptual model from a public health perspective to demonstrate how multiple pathways of transport impact health behaviors and outcomes in Victoria, Australia; and identified spatial indicators policy-makers and planners could apply over a given region to determine how measures of transport support or hinder health behaviors and outcomes.

Intuitively, transportation barriers lead to rescheduled or missed appointments, delayed care, and missed or delayed medication use; these consequences may lead to poorer management of chronic illness and thus poorer health outcomes. Syed *et al*. (2013) synthesize

the literature on the prevalence of transportation barriers to healthcare access, reviewing 61 peer-reviewed studies. Overall, the evidence supports that transportation barriers are an important barrier to healthcare access, particularly for those with lower incomes or the under/uninsured.

Jones & Lucas (2012) sought to highlight the importance of understanding the social impacts and consequences, and the distributional effects of transport decision-making. They point out that different kinds of social impacts are manifest over different time periods. Some have primarily short-run outcomes, where the impacts are directly associated with a transport system or policy intervention (e.g. travel time savings, or collision reductions), while others occur over the longer term and are less direct; they may be cumulative in nature and result from interactions among several short-run outcomes. These long-run consequences are likely to include health condition, social exclusion/inclusion, social capital, etc.

Many studies have assessed the link between transportation access and health outcomes in the U.S. When getting to healthcare services is a barrier, patients often end up not seeking care, missing appointments, or delaying care until a condition deteriorates and requires emergency attention (Transportation for Healthy Communities Collaborative, 2002). Guidry *et al*.'s (1997) study of cancer patients in Texas found that patients, particularly minorities, opt to forgo needed care in the absence of available and affordable means of transportation. Inadequate transportation to pediatric facilities in Boston was found to be the largest barrier identified by Latinos when asked why they did not bring their children in for treatment or checkups (see Flores *et al*., 1998). Yang *et al*. (2006) investigated the impact of transportation problems on households' ability to keep healthcare appointments for their children in an urban setting in the U.S. Logistic regression models found that some of the key characteristic predicting inability to keep an appointment included not using a car to the last kept appointment and not keeping an appointment in the past due to transportation problems. Buchmueller *et al*.'s (2006) studied hospital closures in Los Angeles County between 1997 and 2003 and their effect on distance to the nearest hospital; they found that increased distance to the closest hospital increased deaths from heart attacks and unintentional injuries. For residents with health insurance, increased distance was found to shift regular care towards doctor's offices, and seniors in particular perceived more difficulty accessing care. Arcury *et al*. (2005) analyzed the association of transportation and healthcare utilization in a rural region in the U.S. They found that, controlling for personal characteristics, health characteristics, and distance, those who had a driver's license had 2.29 times more healthcare visits for chronic care and 1.92 times more visits for regular checkup care than those who did not. Fortney *et al*. (1999) showed that travel distance affected the probability of utilization of mental health and alcoholic treatment services. Athas *et al*. (2000) and Nattinger *et al*. (2001) found increasing travel distance to be associated with decreased utilization of breast cancer treatment. Basu & Friedman (2001) found that children living in areas with lower primary care availability were more likely to travel greater distances for ambulatory care sensitive conditions (ACSC) inpatient services, the implication being that disease rates were higher in these areas. Pesata *et al*. (1999) developed a descriptive study to analyze families' perceptions of barriers to attending clinic appointments, surveying 200 participants with a history of missed appointments, mostly families headed by single mothers. Their analysis found that families identified transportation problems as one of the key barriers. Welty *et al*. (2010) sought to determine whether limited transportation affects medication adherence in patients with epilepsy.

Health sector policymakers have cited transportation barriers as key obstacles to providing health care to low-income populations in particular. Silver *et al*. (2012), in a study of low-income, largely immigrant clients in four public clinics in a New York City suburb, found that nearly one-quarter reported having transportation problems, such as limited local bus service, that had caused them to miss or reschedule a clinic appointment in the past. Rask *et al*. (1994) surveyed disadvantaged and minority patients at an urban public hospital presenting for ambulatory care. Their analysis found that lack of transportation was one of the statistically significant predictors of delaying care for a new medical problem.

Education

Empirical evidence is not conclusive about the main factors affecting student achievement (Asahi, 2014), and researchers in the education field have typically focused in traditional schooling inputs such as teaching quality (see, e.g., Rockoff, 2004) or class size (Krueger & Whitmore, 2001).

Two studies, set in Britain and Norway, respectively, have explored the impact of school accessibility on intermediate education outcomes, namely, post-compulsory education enrolment and graduation from upper-secondary schools. Dickerson & McIntosh (2013) found that shorter Euclidian distance between the students' home and their closest school is positively related with the probability that mediocre students continue into post-compulsory education. Similarly, Falch *et al*. (2013) concluded that reduced commuting time has a positive effect on graduation from upper secondary schools, and this effect is larger for students with low academic achievement. Owen *et al*. (2012) explore the impact of low population density and transport constraints on skills development and the take-up of learning and training opportunities in a rural area of eastern England. They conclude that transport and travel play a crucial role in exacerbating poor skills and low productivity.

Developing country evidence

Poor physical access to health facilities also in developing countries has been identified as an important contributor to reduced uptake of preventive health services, likely more so in low-income settings. Variable uptake of available health interventions in SSA has been found to undermine healthcare programs and to play an important role in child and maternal mortality (Rutherford *et al*., 2010).

Based on a systematic review of 34 studies, Lankowski *et al*. (2014) concluded that geographic and transportation-related barriers are associated with poor outcomes across the continuum of human immunodeficiency virus (HIV) care in SSA. Difficulty obtaining reliable transportation to clinics is frequently cited as a barrier to HIV care in the region, and the cost of transportation for monthly clinic visits has been identified as a potential barrier to antiretroviral (ARV) adherence. Tuller *et al*. (2009) conducted interviews to understand structural barriers to ARV adherence and clinical care in Uganda. Almost all respondents cited the need to locate funds for the monthly clinic visit as a constant source of stress and anxiety, and lack of money for transportation was a key factor in cases of missed doses and missed medical appointments. Several other studies, too, have found transportation costs to be a potential barrier to sustained ARV treatment in SSA countries (see, e.g., Hardon *et al*. 2007; Mshana *et al*. 2006). Wesolowski *et al*. (2015) quantified the impact of accessibility on preventative healthcare in Kenya using mobile phone data to understand how estimated travel times to health facilities are

related to individuals' uptake of childhood immunizations and antenatal care. They combined an analysis of the geographic variation in mobility patterns of nearly 15 million anonymous mobile phone subscribers with modeled estimates of travel times to health facilities, generated through standard cost–distance-based spatial analysis methods. The authors then compared these with direct, geocoded measures of childhood immunization and antenatal care uptake, measured by household surveys during a home-based HIV counseling and testing program. Their findings were consistent with the hypothesis that remote communities experience an increased burden of travel; however, the travel patterns were also found to be locally heterogeneous. In sublocations of similar physical access to health facilities, increased mobility was associated with a higher percentage of households accessing preventive healthcare. Thus, mobility can help explain heterogeneities in accessing care for populations with comparable physical travel times to health facilities.

Despite progress in the last decades, nearly 18,000 children under the age of 5 years continue to die every day in low- and middle-income countries (LMICs), many of these deaths due to lack of access to high-quality obstetric and neonatal care (Bhutta *et al*., 2014). A multi-country study, covering 21 LMICs, including Burkina Faso, Cameroon, Zimbabwe, Kenya, Uganda, Guinea, and Mali, estimated the relationship between distance to health facilities, service utilization, and child mortality (see Karra *et al*., 2017). Its results were unequivocal: compared with children who live within 1 km of a facility, children living within 2 km, 3 km, and 5 km of a facility had 7.7-percent, 16.3-percent, and 25-percent higher odds of neonatal mortality. The authors conclude that even relatively small distances from health facilities are associated with substantial mortality penalties for children, and that policies that reduce travel distances and travel times are likely to increase utilization of health services and reduce neonatal mortality. Mucunguzi *et al*. (2014) evaluated a free-of-charge 24-hour ambulance and communication services intervention in a district in Uganda and compared the outcomes with those in a neighboring non-intervention district. They found that hospital deliveries increased by over 50 percent per year in the intervention district with a slight reduction in the average hospital stillbirths per 1,000 hospital births in the intervention district. Reliable communication and transport services increased access to and utilization of maternal health services, particularly caesarean delivery services. A study in western Uganda established that the distance and availability of quality transport were more important factors in the choice of place of delivery compared to cost and quality of health services in the health facility (see Parkhurst & Ssengooba, 2009). A similar intervention in Mali showed that reducing transport time and eliminating financial barriers doubled the utilization of major obstetric interventions, mainly caesarean sections, and was also correlated with increased utilization of health centers for deliveries (see Fournier *et al*., 2009).

Asahi (2014) is among the few studies exploring the effect of school accessibility on student performance in a developing country setting, as measured by mathematics test scores in Santiago, Chile. He posits that school accessibility could affect test scores through several potential mechanisms. First, increased transport accessibility could lead to an upturn in school enrolment, implying greater class sizes, which in turn could decrease student performance. Second, better transport accessibility could affect test scores through school competition, whereby better connected schools face more competition from other schools. Third, better transport accessibility may affect student performance through increased pupil turnover or changes in neighbors' characteristics. The author's own study found that schools that experienced large distance reductions to

the subway network also experienced an increase in their enrolled students, and that increased proximity to the subway network was associated with statistically significantly lower test scores, thus lending evidence to the plausibility of the first potential causal mechanism.

A World Bank team led by Barrett *et al*. (2019) reviewed current research studies on how school infrastructure affects children's learning outcomes and identified key parameters that can inform the design, implementation, and supervision of future educational infrastructure projects. The report describes the key conditions for maximizing effective access to school places, which, among others, involves schools that are locally distributed to maintain reasonable travel-to-school distances. It also cites robust evidence, for example from South Asia, that "school building programs rank among the most effective educational interventions" (Asim *et al*. 2015; Petrosino *et al*. 2012).

Equity of accessibility

Accessibility to transportation systems from population centers has also been explored in relation to the broader concept of "spatial equity" (Delmelle & Casas, 2012). Early discussions of transport equity in the literature revolved around a more economic basis, considering how public transit changed consumer welfare and profit maximization. Later, the focus turned towards a more socially oriented consideration of equity, with attention to how public transportation access was distributed amongst captive or low-income riders (Welch & Mishra, 2013). Transport-related social exclusion refers to the notion that individuals are physically unable to participate in everyday activities, including necessary services and employment (e.g., Church *et al*., 2000). The exclusion itself, however, may be due to a variety of reasons, such as lack of affordability of transportation services, poor public transportation infrastructure or coverage, or the person's physical limitations such as a disability that prevents access to the transportation system.

Policy interest in social exclusion originated in the United Kingdom in the late 1990s as part of a broader social welfare reform under the New Labor government. A Social Exclusion Unit set up in 1997 has sparked off a series of policy documents, including a widely disseminated report that focused on the interactions between social disadvantages and transport disadvantages (Fransen *et al*., 2015). Since the publication of the report, researchers from around the world have built up empirical evidence of social exclusion as an outcome of transport problems, including, to a limited extent, in African countries (see Lucas, 2011; Porter *et al*., 2012).

Equity has been a major concern of public transport provision and is required by legislation in many countries. A range of legislation now requires that government agencies consider fair treatment of all population groups in the provision of services (see, e.g., American Public Transport Association, 2005). In the U.S., metropolitan planning organizations typically undertake an analysis of regional transportation plan equity to comply with federal anti-discrimination law, such as Title VI of the 1964 Civil Rights Act, and federal agencies, both the United States Department of Transportation and the Federal Transit Authority are required to conform to equity standards in terms of vehicle loads, vehicle assignment, vehicle headway, distribution of transit amenities, and transit access (Welch & Mishra, 2013). However, in the absence of detailed guidance, practice has become dominated by a single method that has foundations in the spatial analysis of environmental exposures and the neighborhood effects literature (Karner & Niemeier, 2013). There is no standard definition of distributional equity for transportation benefits (Martens *et al*., 2012). In turn, different definitions of

equity can point to very different priorities for route and service allocation (Litman, 2007).

One approach to defining equity, proposed by Martens *et al*. (2012), relies on theories of justice to support a "maximax" criterion to guide investments that would maximize average access while limiting the maximum gap in accessibility between the lowest- and highest-accessibility groups. Drawing on philosophies of social justice and following a similar approach proposed by Wachs & Kumagai in 1973, Golub & Martens (2014) explore how distributional measures of benefits can be incorporated into the evaluation process for regional transportation plans. They present an equity assessment of the distribution of accessibility in San Francisco Bay Area in order to define the rate of "access poverty" – akin to income poverty – among the population. Fransen *et al*.'s study (2014) set in Flanders, Belgium,[2] proposes a methodology for identifying a mismatch between the socially driven demand for transit and the supply provided by transit agencies. The obtained index of public transport provision is compared to a public transport needs index based on the spatial distribution of various socio-demographics.

Another approach to defining transport equity has been proposed by Litman (2007), who distinguishes between "horizontal equity" and "vertical equity." Horizontal equity (or fairness) distributes benefits evenly to all groups; equity here is essentially defined as equality in terms of uniform spatial distribution in a geographical region or the same distance from each resident to public facilities (e.g., Chang & Liao, 2011). Yet measuring uniform distribution or distance ignores varying population densities in regions and fails to assess whether all residents require the same level of access to benefits (Foth *et al*., 2013). On the other hand, vertical equity (or social inclusion) is concerned with distributing resources between individuals of different abilities and needs; it favors groups based on social class or specific needs in order to make up for overall societal inequalities. These two frameworks reflect two contrasting perspectives in public transport planning. One emphasizes the need to efficiently move the largest numbers of people (Hay, 1993), while the other been called the "social transit" perspective (Betts, 2007), whose goal is to provide transit access to those with greatest need, such as those without private transport or specific demographic groups such as the low-income, youth or ethnic minorities (Deakin, 2007).

Delbosc & Currie (2011b) proposed a simple measure of transit system equity performance in the form of Lorenz curves that measure the relative supply of transit to the population and compares public transport supply for different social groups. In economics, Lorenz curves are a graphical representation of the cumulative distribution function of wealth across the population (Lorenz, 1905). The most common measure for this inequity is the Gini index, which has traditionally been used to calculate the distribution of wealth among a population. The Lorenz curve is a visual representation of equality whereas the Gini coefficient is a single mathematical metric to represent the overall degree of inequality, represented by the ratio of the area between the perfect equity line (a straight line where 50 percent of total income is held by 50 percent of the population) and the Lorenz curve. When there is no difference between the perfect equity line and the Lorenz curve, the index value is 1, representing perfect equity. Following a similar approach, Welch & Mishra (2013) propose a methodology to estimate transit equity using a stylized connectivity measure

2 Flanders is one of the only regions in the world where the right to basic provision to public transport, formulated as having spatial access to a minimum level of public transport service irrespective of the location of residence, is granted by law.

with a Gini index for equity estimation at different levels such as stop, line, zone and area. Murray & Davis (2001) evaluate equity by comparing the need (primarily an index dominated by income) and access (the availability of transit in a particular location). In a study set in Perth, Australia, Ricciardi *et al*. (2015) found that the public transport distribution[3] for socially disadvantaged groups is less equitable when compared to the population as a whole and that, overall, Perth's population exhibits a 0.52 Gini coefficient suggesting a relatively unequal spatial distribution of services to the population yet more equal than that of Melbourne (0.68). Peralta-Quiros *et al*. (2019) used GTFS data for the same SSA cities as the current study to estimate the extent to which the existing public transport systems ensure accessibility to employment opportunities.

Kaplan *et al*. (2014) propose the assessment of equity in transit provision in Copenhagen by considering in-vehicle time, access/egress times, waiting time, service reliability, frequency, and 'seamless' transfers along multi-modal paths, as well as by weighing the impedance components *according to their relative importance to travelers.*

Finally, for the current study, perhaps the most useful conceptual framework for thinking about transport equity is that proposed by Church *et al*. (2000), among others, which distinguishes between the ***category approach*** and the ***spatial approach***. While the spatial approach focuses on the equity of transport access across the urban space, the category approach focuses on the travel patterns, attitudes and needs of particular social groups, for example, women, the poor, or the elderly. For example, research by the Department of Environment, Transport and the Regions (2000), among others, has shown how perceived lack of security in public spaces varies distinctly with social characteristics, especially gender, and strongly influences how public spaces – including transport facilities – are used. Delmelle & Casas (2012) explore the spatial accessibility landscape created by newly implemented BRT system in Cali, Colombia, in terms of both access to the system itself and access to three distinct activities around the city, and explore the equitable distribution of accessibility patterns in relation to neighborhood socio-economic strata. They find that accessibility is the least equitable for hospitals which tend to be spatially clustered.

Of course, particular social groups may not be homogenous in terms of their perceptions or activity patterns, which will affect transport needs and accessibility preferences; there may also be multi-dimensional reasons why individuals are disadvantaged in relation to transport (e.g., not only their income but also physical disability). Still, it is clear that the differences and connections between the `category' and the `spatial' approach lie at the heart of questions over how transport resources are used to tackle social exclusion and to what extent resources should be allocated to benefit particular social groups, or to specific geographical areas.

Delbosc & Currie (2011a) explore the hypothesis that transport disadvantage will have a greater impact on social exclusion and well-being in remote areas than it will in accessible urban areas, as has been theorized in the literature (e.g. Pucher & Renne, 2005). Probst *et al*. (2007) aimed to quantify geographic and race-based differences in distance traveled and time spent in travel for medical/dental care using representative national data in the U.S. They found that rural residents experience higher travel burdens than urban residents when seeking medical/dental care.

3 As measured by the "public transport supply index" initially proposed by Delbosc & Currie (2011a), that is based on proximity to the transit stops and the service level (number of bus and train arrivals per week).

4. Overview of Health and Education Indicators, Commitments, and National and City-Level Policy Goals

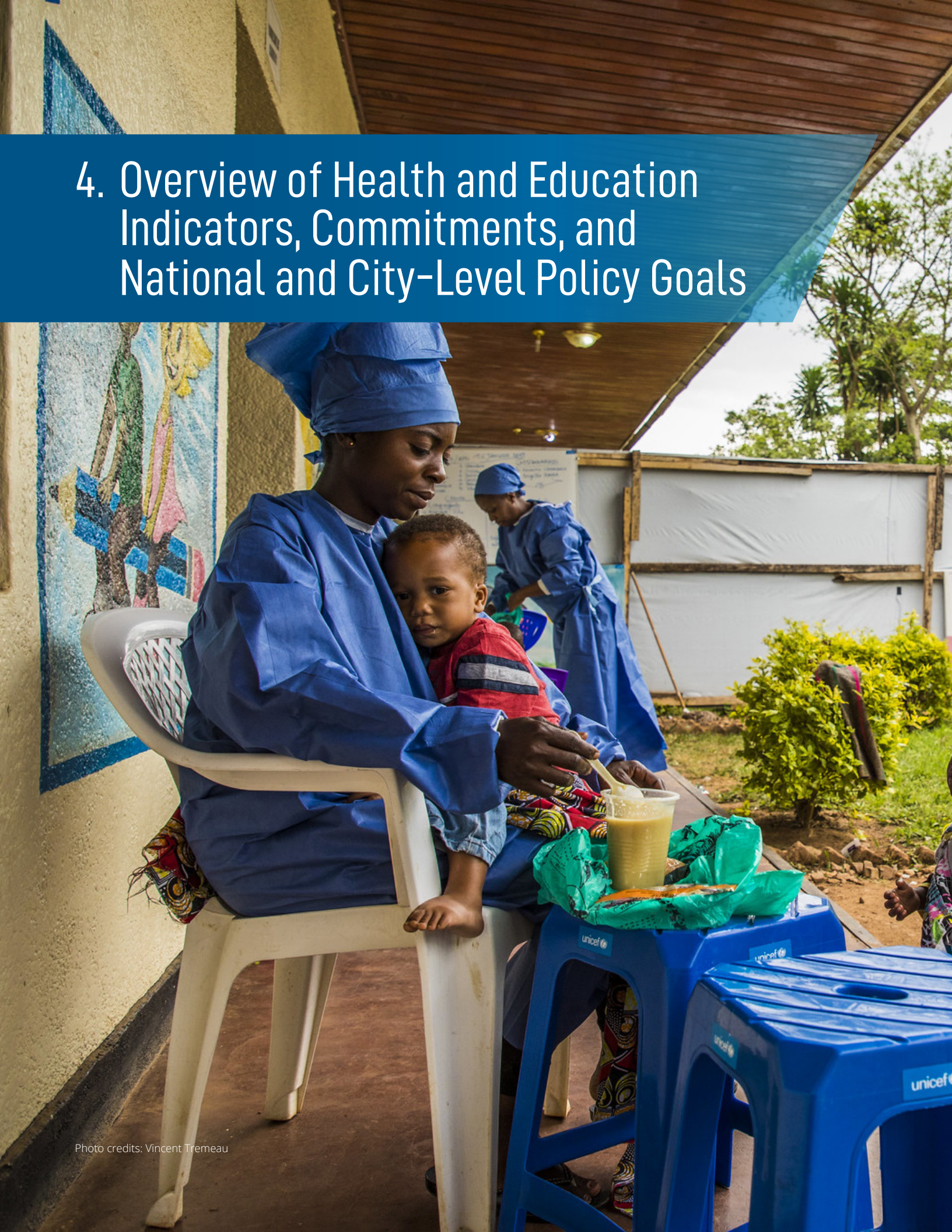

Photo credits: Vincent Tremeau

4.1. Basic health and education indicators

In the three decades following the adoption of the Convention on the Rights of the Child, despite an exploding global population, it has been possible to reduce the number of children missing out on primary school by almost 40 percent. Gains in child survival and health are matched by leaps in access to schooling and enhanced protection of children from harmful practices. In 1990, almost 20 per cent of children of primary-school age were not in school; now this ratio is below 10 per cent globally. Gender disparity in access to primary education has largely disappeared in most countries, although Africa remains an exception. Despite these and many other successes, in terms of both influence and tangible results, the Convention stands at a crossroads, as its realization – translating rights into results for children – has been mixed and uneven. Progress on realizing children's right to education is also a cause for concern. Globally, the number of out-of-school children at the primary level has remained largely static since 2007, as increased access to primary education has barely kept pace with global child population growth – particularly in Africa. Gender gaps, while diminishing in some cases, persist in many areas of child rights that have seen strong gains, including access to secondary education. While the global number of out-of-school children of primary-school age dropped from 100 million in 2000 to 59 million in 2018, in percentage terms, the reduction in the number of out-of-school children has just about kept pace with the expansion in the total population of primary-school-age children, particularly in Africa (UNICEF, 2019). SSA also contributes more than a half of the world's maternal mortality and has had the slowest annual reduction rate of maternal mortality from 1990 (Mucunguzi *et al*., 2014).

Across the cities in scope of the study, basic health and education indicators – such as primary school enrollment rates, infant and maternal mortality, and preventative healthcare access – have improved over the recent decade and are also characteristically superior to the averages in the countries overall. Table 1 summarizes the key indicators at the country level based on the most recent data available from UNICEF. The purpose of this summary is not a direct comparison across countries but rather the setting of the stage for the later discussion on spatial and population groups-based inequalities.

Among the health indicators, some of the greatest variability across the countries in scope of this study is in terms of maternal and infant care and directly relates to the persons' ability to physically reach healthcare services (or be reached by health professionals). For example, the share of infants who have received three doses of the DTP vaccine, a combined vaccine against diphtheria, pertussis (whooping cough) and tetanus, ranges from just 45% in Guinea to more than double that in Burkina Faso, Rwanda, and Tanzania. Similarly, the proportion of births attended by skilled medical personnel is less than half in Mali but over three-quarters in Burkina Faso, Rwanda, and Zimbabwe.

As noted, these averages are not directly relevant to the countries' largest cities, where health facility coverage is much better and so are the average incomes. For example, in Bamako, the vast majority of deliveries (97%) take place in a health facility – a much higher share than in Mali overall (67%) (Republique du Mali, 2019). In individual countries, also the progress over time in closing human development gaps has been more significant in urban areas. For example, as noted in Cameroon's National Development Strategy 2020-2030, despite some progress reached in the past, the country's Human Capital Development Index slightly between 2012 and 2017, which can be attributed to infant malnutrition and education and health policies that focused the resources in urban areas at the expense of the rural ones.

Table 1: Key indicators of current health and education status

	Burkina Faso	Cameroon	Rwanda	Zimbabwe	Kenya	Tanzania	Mali	Guinea	Mozambique	Uganda
Population, million (2018)	18.1	23.3	11.6	15.6	46.1	53.5	17.6	12.6	28	39
HEALTH										
Child mortality (<5) per 1,000 live births	81	84	38	50	46	54	106	86	72	49
Infant mortality per 1,000 live births	51	55	29	36	34	38	66	56	53	35
<5 children with suspected pneumonia taken to health provider (%)	52	28	54	51	66	55	23	30	50	80
Infants who receive 3 doses of DTP vaccine	91	86	98	89	82	97	66	45	80	85
Children who received the 2nd dose of measles containing vaccine	50	NA	95	78	35	79	NA	NA	45	NA
Antenatal care coverage for at least 4 visits (%)	47	59	44	76	58	51	38	51	51	60
Proportion of births attended by skilled medical personnel (%)	80	65	91	78	62	63	44	63	54	74
Births who had their first postnatal check-up within the first 2 days after birth (%)	33	68	19	73	36	42	63	63	NA	11
EDUCATION										
Attendance in early childhood education (%)	3	28	13	22	NA	NA	5	NA	NA	NA
Adjusted net attendance rate, primary education	52	85	94	95	85	81	53	60	71	85
Adjusted net attendance rate, lower secondary education	18	50	30	55	42	28	30	29	16	19
Adjusted net attendance rate, upper secondary education	5	30	15	24	36	3	13	12	3	8
Completion rate, primary education	31	65	54	88	79	80	43	42	40	36
Youth (15-24) literacy rate	50	81	85	90	87	86	49	46	71	84
Adult literacy rate, male	37	78	71	88	78	75	43	37	67	83
Adult literacy rate, female	22	65	62	80	67	61	20	12	36	65

Source: UNICEF (https://data.unicef.org/country/)

Under-5 mortality has declined across the region; for example, over the last 25 years, better access to public healthcare in Tanzania has saved many young lives and the under-5 mortality has been nearly halved. Nevertheless, children's use of potentially life-saving healthcare services remains limited in some countries, at least partly due to inability or unwillingness of families to physically travel to health facilities that could provide the care needed. For example, only half or less of all children under 5 with suspected pneumonia are taken to a health provider in Cameroon, Mali, Guinea, and Mozambique.

School attendance rates – similarly at least partly a function of the children's ability to physically reach school facilities – decline markedly as one moves from primary to upper secondary education levels. In all countries in scope of this study, the difference between primary and upper secondary attendance rates is above 40 percentage points; in all countries except Kenya, the net attendance rate at the upper secondary level is less than one-third. Zimbabwe's Interim Poverty Reduction Strategy Paper 2016-2018 highlights the high rates of literacy and enrolment in primary level but less than optimal transition rates to secondary education. Similarly, many Tanzanian children continue to miss out on education: about 23% of children aged 7-13 years are not in school, and, while 80% of children complete primary school, only 31% – lower secondary school. Less than half of all 5-year-olds have access to pre-primary education.[4]

Gender gaps in adult literacy rates remain significant across the region, exceeding 20 percentage points in Mali, Guinea, and Mozambique, which are at least partly explained by gender gaps in school enrollment and attendance. In Conakry, and Guinea overall, there are notable gender inequalities in school enrollment and attendance, in particular at the secondary level. The ratio of female to male enrolment rates drops 20 percentage points from primary to secondary education, reaching only 60% in the case of the latter (World Bank Group, 2018b). Attendance rate in Conakry is 84% for boys and 81% for girls at the primary level but decreases to 58% and 48%, respectively, at secondary level. In Mozambique, the education sector has been reported to suffer from absenteeism and low primary and secondary completion rates, and even while there has been progress in gender parity, enrollment rates and educational attainment at higher levels of education have large gender gaps (World Bank, 2016c). In Dar es Salaam, primary net enrollment ratios in 2011-12[5] were 91% for boys and 89% for girls but the gap was wider at the secondary level, where the respective shares were 62% and 48% (The United Republic of Tanzania, 2013b). In Kampala, despite a high school attendance rate among 6-12 year old children (97%), there is a slight disparity against females (UBOS, 2016). In Mali, while girls are slightly more likely to attend school in the youngest age group, enrollment rates among boys are higher in all older age groups, and the gap between male and female enrollment rates widens to 5 percentage points at ages 16–18 (Kuépié, 2016).

A notable exception is Zimbabwe, which, according to MICS 2019, had somewhat higher effective transition rates to lower secondary school for girls than for boys (75% and 66%, respectively); the overall effective transition rate in Harare specifically was 84% (ZIMSTAT, 2019).

4 Basic Education Statistics in Tanzania (BEST) 2017; Final Findings Report, Tanzania National Early Grade Reading Assessment (EGRA), 2016; Out of School Children: Tanzania Country Report

5 These indicators were not available in the 2017/18 Household Budget Survey.

4.2. National laws and commitments to relevant international human rights treaties on education and health access

International and regional human rights law provides for the right to education and healthcare for all. The Rights to Education and Healthcare are defined as fundamental human rights in the Universal Declaration of Human Rights, as is the Right to Equality – a concept that is multi-faceted and encompasses equality in access to all life quality enhancing opportunities such as education and healthcare. This concept in further enshrined in the International Covenant on Civil and Political Rights (ICCPR). The International Covenant on Economic, Social, and Cultural Rights (ICESR) further recognizes the right to education (Articles 13 and 14), as does the Convention on the Rights of the Child (CRC) (Articles 28 and 29). The Convention on the Elimination of Discrimination Against Women (CEDAW) recognizes the right to education for women (Article 10). The Convention on the Rights of Persons with Disabilities (CRPD) recognizes the right to education for persons with disabilities in Article 24, and this is also recognized for children in the CRC (Art. 23). The African Charter on Human and People's Rights (ACHPR) defines the right to education in Article 17. The African Charter on the Rights and Welfare of the Child provides for the right to education in Article 11. This right for women is also included in the Maputo Protocol (on the Rights of Women in Africa) in Article 14.

Likewise, the Right to Health is part of the right to an adequate standard of living (Universal Declaration of Human Rights, Art. 25) and was again recognized as a human right in the ICESR (Art. 12). The CRC recognizes the right for children (Article 24), and CEDAW recognizes the right to health for women (Art. 12). The CRPD recognizes the right to health for persons with disabilities in Article 25, also recognized in the CRC (Art. 23). The ACHPR defines the right in Article 16. The African Charter on the Rights and Welfare of the Child provides for the right to education in Article 14. This right is also included in the Maputo Protocol (on the Rights of Women in Africa) in Article 12.

Underlying disparities mean that, regardless of the efficiency of the a city's transport system, education and health may not be accessible for the entire population. This section outlines the implementation of the international and regional human rights treaties which the ten targeted countries have ratified. It does so by summarizing findings from key human rights reports, submitted during the Universal Periodic Review (UPR) to the Office of the United Nations High Commissioner for Human Rights (OHCHR), as well as reports from the African Commission on Human and People's Rights (ACPHR) over the past decade as related to the rights to education and healthcare. Particular attention is given to access by women and children.

All of the countries whose cities are covered in this report have ratified most, if not all of the relevant human rights treaties. Individual exceptions include Cameroon, which has signet, but not yet ratified, the Convention on the Rights of Persons with Disabilities, and Mozambique, which has yet to ratify the International Covenant on Economic, Social, and Cultural Rights.

Despite the formal commitments, challenges remain in ensuring access to education for all, and gender disparities are reported to persist in most countries. In Cameroon, school attendance is free and compulsory. Still, financial constraints are reported to be a barrier, particularly for women, to access education due to the indirect costs of attendance.[6] Other barriers include "lack of infrastructure, lack of educational

6 Consideration of reports submitted by States parties under article 18 of the Convention, Seventh to ninth periodic reports of States parties due in 2014, para. 29, 13 July 2015.

materials and the shortage of qualified teachers."[7] In some locations, armed groups have called for boycotting schools, and have used schools as bases. While this has not been reported in Douala, as it occurs in English-speaking parts of the country, it has an impact on the education system generally (Human Rights Watch, 2020c).

In Burkina Faso, similarly, the Education Policy Act provides for free schooling and mandatory attendance for students, reducing gender gaps and increasing enrolment.[8] However, several attacks on schools by armed groups have affected access to education. Armed groups have also reportedly threatened teachers, children, and families, causing fear about attending school, and in some cases, resulting in school closures. In March 2020, the Ministry of Education reported that 2,500 schools had been closed due to attacks or insecurity. Some children began to attend schools further from their homes in order to access education, but they are exposed to other dangers during long transits (Human Rights Watch, 2020a). This violence interferes with children's right to education.

In Rwanda, primary education is compulsory and free, and the Government provides additional, targeted support to low-income families to support indirect costs.[9] Work to improve school environments for girls in particular helped to increase attendance. The country no longer penalizes girls for their pregnancies, allowing them to stay in school.[10] However, the CRPD Committee expressed concerns about ongoing barriers to accessing education, in part due to long distances and accessibility accommodation, though this is more pronounced in rural areas.[11] Children in Rwanda reported that teachers' conduct and punishments may pose a barrier to student's attendance in school.

Barriers to women's education in Zimbabwe are reported to include cultural attitudes, early marriage, and challenges of returning to school after pregnancy.[12] In part, this is reportedly due to religious beliefs that girls cannot continue education after marriage.[13] The Government is working to eliminate negative attitudes and has provided for girls with children to return to school.[14] However, practices persist that preclude girl mothers from being readmitted.[15] Likewise, travel to school includes risks, particularly for girls, of harassment and violence, though most often in rural locations. The Government is working to minimize distances to school and increasing accountability for perpetrators of sexual harassment and abuse.[16]

Guinea has prioritized gender equality policies, including to repeal measures banning pregnant girls from schools. Primary education in Guinea is compulsory,

7 CRPD/C/RWA/CO/1, para. 43.

8 Committee on the Rights of the Child Seventy-first session, 11-29 January 2015, List of issues in relation to the second periodic report of Zimbabwe, Replies of Zimbabwe to the list of issues, 15 October 2015.

9 Human Rights Watch Submission to the Committee on the Elimination of Discrimination against Women (CEDAW) of Zimbabwe's periodic report for the 75th CEDAW Session, December 2019.

10 CEDAW Sixth periodic report submitted by Zimbabwe under article 18 of the Convention, para. 60, 6 December 2018.

11 Committee on the Rights of the Child Seventy-first session, 11-29 January 2015, List of issues in relation to the second periodic report of Zimbabwe, Replies of Zimbabwe to the list of issues, 15 October 2015.

12 Id., para. 68.

13 Committee on Economic, Social and Cultural Rights, Initial report submitted by Guinea pursuant to articles 16 and 17 of the Covenant,, E/C.12/GIN/1, para. 270, 29 March 2019.

14 Committee on the Elimination of Discrimination against Women, Consideration of reports submitted by States parties under article 18 of the Convention on the Elimination of All Forms of Discrimination against Women, Combined seventh and eighth periodic reports of States parties, CEDAW/C/GIN/7-8, para. 84.

15 Amnesty International, GUINEA: SUBMISSION TO THE HUMAN RIGHTS COMMITTEE, LIST OF ISSUES, AI Index: AFR 29/7600/2017, 13 December 2017.

16 FIDH, et. al., Comité CEDEF, Examen de la Guinée Rapport alternatif conjoint, FIDH-OGDH-MDT-AVIPA- CODDH. October 2014.

but difficult learning conditions are thought to drive up dropout rates:[17] an estimated 72% of girls are out of school, compared to 55% of boys.[18] Guinea recently modified its criminal code to criminalize forced marriage, having had a high rate of child marriage: three in five girls were married before 18 according to the United Nations Population Fund (UNFPA), impeding girls' access to education.[19] There are reports of sexual abuse and sexual harassment in schools, particularly affecting girls, likely impacting girls' enrolment and attendance, and relatedly, literacy.[20] The country's National Habitat III report notes the need to increase citizen participation and to improve the consideration of human rights in urban development, in particular, by putting in place initiatives to protect and promote the rights of women and girls (see Republique de Guinee, 2016).

Tanzania provides free and compulsory primary education, but there are reports that additional fees and geographic disparities limit access for all children.[21] The Government has reportedly agreed not to pursue discriminatory actions against pregnant girls' access to school.[22] However, even where girls may not be banned from attending, there are concerns that they may stop accessing education for fear of the stigma and of possibly being expelled subsequently.[23] Further, girls may not access school due to risks of sexual violence while traveling to or from school. In urban areas, there are reports that children must use commuter buses to access schools, which are reported to be unsafe for them, possibly affecting access to education.[24] There have also been reports that schools are the second most common context for sexual violence.[25]

Public education is provided for in Mali's Constitution, but low school attendance persists, in part due to the lack of school infrastructure. Early marriage and high rates of child labor may also affect school enrolment.[26] Mali has worked to improve girls' enrolment and develop non-formal education options.[27]

Kenya has free primary education; however, other barriers include shortage of teachers, insufficient facilities, indirect costs, and poor learning environments.[28] The Government has worked on equipping schools to be more inclusive for girls to improve access, including through provision of sanitary towels.[29]

Mozambique has removed barriers to pregnant girls from attending class, banned child marriage to improve

17 Convention on the Rights of the Child, final recommendations, 3 March 2015.

18 United Republic of Tanzania United Nation's Convention on the Rights of the Child (UNCRC) NGO REPORT.

19 Human Rights Watch, Q & A on Ban on Pregnant Girls and World Bank Education Loan

20 United Republic of Tanzania United Nation's Convention on the Rights of the Child (UNCRC) NGO REPORT.

21 Center for Reproductive Rights, Re: Supplementary information on Tanzania scheduled for review by the Committee on Elimination of Discrimination against Women during its 63rd Pre-sessional Working Group, June 2, 2015

22 CEDAW/C/MLI/Q/6-7/Add.1, 7 March 2016.

23 Committee on Economic, Social and Cultural Rights, Initial report submitted by Mali under articles 16 and 17 of the Covenant, para. 368. 8 February 2018.

24 Ministry of Education, Science and Technology Strategic Plan 2013-2016, Education under Threat: The Commercialization of Education in Kenya, Supplementary report submitted by the Economic and Social Rights Centre, January 2016.

25 E/C.12/KEN/2-5, para. 9.

26 Combined third to fifth periodic reports submitted by Mozambique under article 18 of the Convention, CEDAW, 22 March 2018.

27 Supplementary Information on the Status of Women's Economic Social and Cultural Rights in Uganda to the Committee on Economic, Social, and Cultural Rights during its 55th session prepared and submitted by the Women NGOS on ESCRs in Uganda, June 10, 2015.

28 Consideration of reports submitted by States parties in accordance with articles 16 and 17 of the International Covenant on Economic, Social and Cultural Rights, Burkina Faso, E/C.12/BFA/1, para. 230 (received February 25, 2015).

29 Center for Reproductive Rights CEDAW Submission, Rwanda.

girls' access to education (Human Rights Watch, 2020e), and there are measures in place to limit sexual harassment in schools.[30]

Uganda has increased access to primary schools and provides universal primary education free of charge. However, teacher absenteeism, in part due to lack of transport and low pay, continues to inhibit access to education in practice.[31]

Access to health for all is still impeded by many challenges, including accessibility related ones, although affordability and quality appear to be more constraining issues. Free primary healthcare in Burkina Faso is guaranteed, but not all medical procedures are free of charge,[32] and there continues to be high infant and child mortality. Cameroon has the third highest cost of healthcare in SSA, resulting in 64% of households not seeking healthcare due to the cost (Human Rights Watch, 2020d). To address this issue, the country has provided vouchers to expand access for mothers and children to maternal care.

Adolescents and low-income women in Rwanda reportedly face obstacles accessing family planning services, in part due to social stigma.[33] Rwandan women and girls reportedly walk an hour to reach the nearest health facility in some locations, though more so in rural areas. This distance poses a barrier to accessing these services. Rwanda is investing in additional health centers within an hour walking distance to improve access; universal insurance has also helped improve access.[34]

Guinea has suffered from conflicts, internally and in neighboring countries, which has affected health outcomes. In addition, the Ebola virus negatively impacted health outcomes, including maternal mortality.[35] Maternal mortality remains high, while access to quality obstetric care is low.[36]

While maternal and child health care is provided for free in Tanzania, stockouts and other fees reportedly continue to limit access to care.[37] Adolescents have reported discrimination in accessing reproductive health services, as have survivors of sexual violence.[38] Access to reproductive health is also reportedly a challenge following government policies discouraging usage.[39]

In Kenya, there is free maternity care in public hospitals, and for children under five.[40] Kenya piloted universal

30 Consideration of reports submitted by States parties under article 40 of the Covenant, Fourth periodic reports of States parties due in 2013, Rwanda, para. 134, 11 July 2014]

31 CRC/C/GIN/3-6, Combined third to sixth periodic reports submitted by Guinea under article 44 of the Convention, para.79, 28 August 2018.

32 Committee on the Elimination of Discrimination against Women, Consideration of reports submitted by States parties under article 18 of the Convention on the Elimination of All Forms of Discrimination against Women, Combined seventh and eighth periodic reports of States parties, CEDAW/C/GIN/7-8, para. 126-127.

33 Center for Reproductive Rights, Re: Supplementary information on Tanzania scheduled for review by the Committee on Elimination of Discrimination against Women during its 63rd Pre-sessional Working Group, June 2, 2015.

34 Center for Reproductive Rights, Re: Supplementary information on Tanzania scheduled for review by the Committee on Elimination of Discrimination against Women during its 63rd Pre-sessional Working Group, June 2, 2015

35 Id.; Convention on the Rights of the Child, final recommendations,

36 Consideration of reports submitted by States parties under articles 16 and 17 of the International Covenant on Economic, Social and Cultural Rights, Combined second to fifth periodic reports of States parties due in 2013, E/C.12/KEN/2-5, para. 1. 1 July 2013.

37 Center for Reproductive Rights, CRC Submission.

38 Committee on the Elimination of Discrimination against Women, Consideration of reports submitted by States parties under article 18 of the Convention, Eighth periodic report of States parties due in 2015, CEDAW/C/KEN/8, para. 168, 3 March 2016.

39 Center for Reproductive Rights, letter January 13, 2019 to The Human Rights Committee RE: Supplementary information for list of issues for Kenya, scheduled for adoption by the Human Rights Committee during its 128th session (2 to 27 March 2020).

40 Committee on the Rights of the Child, Combined third and fourth periodic reports submitted by Mozambique under article 44 of the Convention, para. 242, 28 March 2018.

health care and continues to expand maternal care. However, challenges to access are reported to include poor quality, long distances to facilities, cost, and risk of detention for any unpaid bills.[41] Women with lower incomes and lower education levels have additional challenges in accessing healthcare, according to reports:[42] they are reportedly unaware of how to register for free maternal care services, and those who do register report that post-delivery services are not covered. Unsafe abortion is another contributor to high maternal mortality due to women's inability to access safe abortions.[43]

Expanding the number of healthcare centers has reduced the transport time for the population in Mozambique, resulting in increased access of health services.[44] However, while public health facilities are legally obligated to provide free healthcare services to pregnant women, this is being inconsistently applied in practice (World Bank, 2016c).

In Uganda, women continue to experience challenges in accessing healthcare, in particular reproductive care, due to reports that their partners make decisions regarding healthcare.[45]

The countries have made progress in ensuring education and healthcare access for people with disabilities, but disparities remain. In Burkina Faso, children with disabilities who have a disability card have the right to education based on Act No. 012-2010/AN of 1 April 2010.[46] School fees and costs of supplies are covered by the Government. The Act requires that schools themselves be "adequately equipped to accommodate pupils with disabilities," and also provides that transport companies must make transport accessible to persons with disabilities.[47] Persons with disabilities also have the right to health care benefits, including free consultations and treatment.[48] Nonetheless, human rights reports state that difficulties to access public services continue, particularly affecting girls' school attendance.[49]

Cameroon has taken action to make education accessible for persons with disabilities. Still, some human rights actors have reported that discrimination continues to be an impediment to access, particularly for girls.[50]

Despite attention provided to persons with disabilities in Rwanda, and an inclusive education plan, there are concerns about neglect and abuse of persons with disabilities.[51] Affordable and accessible public transport

41 November 2015, Banjul, The Gambia Concluding Observations and Recommendations on the 5th Periodic State Report of the Republic of Uganda (2010 – 2012), para. 77; Center for Reproductive Rights, CEDAW Committee Submission, 15 September 2010.

42 Consideration of reports submitted by States parties in accordance with articles 16 and 17 of the International Covenant on Economic, Social and Cultural Rights, Burkina Faso, E/C.12/BFA/1, para. 141 (received February 25, 2015).

43 Initial report submitted by Burkina Faso under article 35 of the Convention, due in 2011, CRPD/C/BFA/1, para. 37, 108.

44 Initial report submitted by Burkina Faso under article 35 of the Convention, due in 2011, CRPD/C/BFA/1, para. 37, 117 (received November 30, 2018).

45 CNDH, Rapport Alternatif De La Commission Nationale Des Droits Humains Sur La Mise Eb Œuvre De La Convention Relative Aux Droits Des Personnes Handicapees, para. 1, 2. July 2020.

46 International Disability Alliance, Suggestions for disability-relevant questions to be included in the List of Issues prior to reporting, Country report task force, Human Rights Committee, 103rd Session.

47 CRPD/C/RWA/CO/1, para. 29.

48 CRPD/C/RWA/CO/1, para. 43(c).

49 Combined fifth and sixth periodic reports submitted by Rwanda under article 44 of the Convention, para. 61, 10 July 2018.

50 Our views on how Children's Rights are respected in Rwanda- Report by Children, CRC Submission, August 2018.

51 Convention on the Rights of the Child, final recommendations, 3 March 2015.

is one challenge.[52] The Government's education plan ensures that schools are disability friendly.[53] However, children report that sign language and other disability accommodation remains inadequate.[54]

In Tanzania, there are reports that children with disabilities continue to face stigma, possibly affecting their access to education, though mostly in rural areas.[55] Due to risk of attacks on children with albinism, there are Government-established boarding schools. While these protect against violence, they separate children from their families.[56]

Although Guinea has ratified the CRPD, inclusive policies and practices have yet to be implemented.[57] Children with disabilities are reported to not have adequate support services, impeding their access to education.[58]

In Zimbabwe, discrimination on the grounds of disability is forbidden in the Constitution and the Disabled Persons Act.[59] Healthcare facilities in Zimbabwe are being made accessible for children with disabilities, including by teaching sign language to professionals.[60]

Mali has worked to improve infrastructure, to make public services more accessible for persons with disabilities. However, limitations on transport are reported to continue to be problematic, possibly impeding access to healthcare and education.[61] The country has also developed special education for children with disabilities is provided in some parts of the country. Due to limited financing, the services available do not yet meet the needs of children with disabilities.[62] Regulations protect persons with disabilities from discrimination when accessing healthcare.[63] However, healthcare access remains challenging, in particular, reproductive and sexual health services are reportedly not universally accessible.[64]

Kenya's Constitution grants the right to the highest attainable standard of health, and the country provides free treatment to children with disabilities whenever possible.[65] Kenya has strong disability inclusion policies and requires all Ministries to mainstream disability inclusion.[66] Kenya's Persons with Disabilities Act (2003), and its Constitution provide access to free, compulsory, and inclusive educational and reasonable access

52 Id.

53 CRC/C/GIN/3-6, Combined third to sixth periodic reports submitted by Guinea under article 44 of the Convention, para.76, 28 August 2018.

54 Committee on Economic, Social and Cultural Rights, Initial report submitted by Guinea pursuant to articles 16 and 17 of the Covenant,, E/C.12/GIN/1, para. 287, 29 March 2019.

55 Human Rights Watch Submission to the Committee on the Elimination of Discrimination against Women (CEDAW) of Zimbabwe's periodic report for the 75th CEDAW Session, December 2019.

56 Committee on the Rights of the Child Seventy-first session, 11-29 January 2015, List of issues in relation to the second periodic report of Zimbabwe, Replies of Zimbabwe to the list of issues, 15 October 2015.

57 Initial report submitted by Mali under article 35 of the Convention, CRPD/C/MLI/1, para. 128, June 24, 2019.

58 Initial report submitted by Mali under article 35 of the Convention, CRPD/C/MLI/1, para. 129, June 24, 2019.

59 Initial report submitted by Mali under article 35 of the Convention, CRPD/C/MLI/1, para. 108, June 24, 2019.

60 L'application de la Convention sur l'Elimination de toutes les forms de Discrimination à l'Egard des Femmes, RAPPORT ALTERNATIF AUX 6ème et 7ème RAPPORTS PERIODIQUES DU GOUVERNEMENT DU MALI.

61 Consideration of reports submitted by States parties under article 35 of the Convention Initial reports of State parties due in 2010, CRPD /C/KEN/1, para. 116. 3 April 2012.

62 Consideration of reports submitted by States parties under article 35 of the Convention Initial reports of State parties due in 2010, CRPD /C/KEN/1, para. 49, 69-70. 3 April 2012.

63 Consideration of reports submitted by States parties under article 35 of the Convention Initial reports of State parties due in 2010, CRPD /C/KEN/1, para. 178. 3 April 2012.

64 Consideration of reports submitted by States parties under article 35 of the Convention Initial reports of State parties due in 2010, CRPD /C/KEN/1, para. 105. 3 April 2012.

65 Center for Reproductive Rights, CEDAW Submission.

66 Id.

to public transport for children with disabilities.[67] The Kenyan government supports students with disabilities to attend university, and the country's Ministry of Education and Ministry of Health work to identify children's needs early on.[68] Still, very few children with disabilities attend school after primary school. Advocates report that girls with disabilities are particularly prone to sexual abuse and that they may be discouraged from accessing education for fear of potential harassment.[69] There are also reports that individuals with disabilities face stigma, discrimination, and other challenges in accessing family planning services.[70]

The Persons with Disabilities Act of Uganda provides the right to access medical care. While being implemented, there are reports of inadequate access to health facilities for persons with disabilities, finding that, in 2012, only 2-25% had access to rehabilitation services.[71] Challenges also remain in terms of access to education for children with disabilities.[72]

Mozambique is reported to monitor transport and public infrastructure for accessibility for people with disabilities.[73]

In most of the countries, persons identifying as lesbian, gay, bisexual, transgender, and intersex (LGBTI) continue to face implicit or explicit discrimination in accessing education and healthcare; this is often also the case for people living with HIV/AIDS. In Burkina Faso, there are reports that LGBTI individuals are unable to access healthcare due to discrimination. Due to fear of harassment and stigma, LGBTI persons may not seek healthcare. Likewise, HIV-positive individuals reportedly fear accessing medical services due to fear of harassment (U.S. Department of State, 2019).

Cameroon's penal code criminalizes same sex relations, and LGBTI persons have also reportedly been attacked physically, with impunity (Human Rights Watch, 2020b). Due to the law criminalizing homosexuality, LGBTI individuals may be less likely to access healthcare for fear of repercussions if their sexual orientation is exposed.[74] The UN has found that, although HIV prevalence in Douala was 24% in 2011, members of the LGBTI community were unable to obtain HIV services.[75]

There are reports of ongoing stigma and discrimination against LGBTI people in Zimbabwe (Human Rights Watch, 2019a), and local groups report that LGBTI populations face discrimination in healthcare settings in particular; many LGBTI persons do not seek services out of fear of stigma.[76]

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67 November 2015, Banjul, The Gambia Concluding Observations and Recommendations on the 5th Periodic State Report of the Republic of Uganda (2010 – 2012), para. 118; Consideration of reports submitted by States parties under articles 16 and 17 of the International Covenant on Economic Social and Cultural Rights, Initial reports submitted by States parties due in 1990, 6 December 2012.

68 Consideration of reports submitted by States parties under articles 16 and 17 of the International Covenant on Economic Social and Cultural Rights, Initial reports submitted by States parties due in 1990, para. 74, 6 December 2012.

69 Committee on the Rights of Persons with Disabilities, Initial report submitted by Mozambique under article 35 of the Convention, para. 1, 3 January 2020.

70 Submission by Human Rights Watch to the Committee on Economic, Social and Cultural Rights on Cameroon 65th session, 2019.

71 Id.

72 Submission to the UN Committee on the Elimination of Discrimination Against Women, 75th Session (10-28 February 2020), Review of Zimbabwe.

73 United Republic of Tanzania United Nation's Convention on the Rights of the Child (UNCRC) NGO REPORT.

74 Human Rights Watch 2019 Annual report, Tanzania; Human Rights Watch, Obstructions to LGBTI Health Rights.

75 Convention on the Rights of the Child, final recommendations, 3 March 2015.

76 List of Issues Relating to the Violence and Discrimination against Lesbian, Bisexual, Transgender, Intersex and Queer Women in Kenya, Submitted for the consideration of the 8th periodic report by Republic of Kenya for the 68th Session of the Committee on the Elimination of all forms of discrimination Against Women, Minority Women in Action, AFRA-Kenya, Kenya Campus Lasses Association and the National Gay and Lesbian Human Rights Commission.

In Tanzania, the Government has reportedly agreed not to pursue discriminatory actions with regard to LGBTI populations,[77] but reported arrests have taken place of LGBTI individuals (Human Rights Watch, 2019b). Tanzania makes adult same sex conduct punishable, and drop-in centers for health care for LGBTI patients have been closed, impeding LGBTI individuals' access to health.[78] Children with HIV and AIDS have reportedly been unable to access proper health services, particularly for adolescents and due to sexual orientation.[79]

In Kenya, and non-cis women reportedly face discrimination at health facilities and have reported to have been refused services.[80]

In Mozambique, homosexuality has been decriminalized; nonetheless, reports that LGBTI women are discriminated against persist and may affect their access to services.[81] Similarly, individuals with albinism reportedly continue to face discrimination and stigma, and are unable to access services (Human Rights Watch, 2019c), and children with albinism are reported to have limited accommodations in schools (Human Rights Watch, 2019d). Children living with disabilities and HIV/AIDS are guaranteed education assistance.[82] On the other hand, while the country's laws provide rights to healthcare for HIV positive individuals, access to reproductive health and family planning remains limited.[83]

Discrimination is reported to persist for sexual minorities in Uganda, as same sex relationships remain illegal.[84] There are reports that sexual minorities and sex workers are unable to access healthcare due to stigma and punitive laws on same sex relationships (Human Rights Watch, 2014). Recent policies seek to eliminate discrimination in accessing HIV/AIDS and reproductive health services for persons with disabilities.[85]

Rwanda's healthcare policies take into consideration needs of children affected by HIV.[86] However, there remain gaps in availability of accessible health facilities, particularly with regard to HIV/AIDS services and sexual and reproductive health services.

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77 Contribution to the Committee on the Elimination of All Forms of Discrimination against Women in relation to the consideration of the State report of Mozambique (73 Session (01 -19 Jul 2019) Presented by ODRI "Intersectional rights" - Office for the Defense of Rights and Intersectionality, June 10, 2019.

78 Committee on the Rights of the Child, Combined third and fourth periodic reports submitted by Mozambique under article 44 of the Convention, para. 279, 28 March 2018

79 Consideration of Reports Submitted by States Parties under Article 62 of the African Charter on Human and Peoples' Rights, Concluding Observations and Recommendations on the Second and Combined Periodic Report of the Republic of Mozambique on the Implementation of the African Charter on Human and Peoples' Rights (1999 – 2010).

80 Consideration of reports submitted by States parties under articles 16 and 17 of the International Covenant on Economic Social and Cultural Rights, Initial reports submitted by States parties due in 1990, para. 74, 6 December 2012.

81 Consideration of reports submitted by States parties under article 35 of the Convention, Initial report of State party. Uganda, 22 January 2013.

82 Combined fifth and sixth periodic reports submitted by Rwanda under article 44 of the Convention, para. 63, 10 July 2018.

83 Consideration of reports submitted by States parties under article 35 of the Convention Initial reports of State parties due in 2010, CRPD /C/KEN/1, para. 103. 3 April 2012.

84 Consideration of reports submitted by States parties under article 35 of the Convention Initial reports of State parties due in 2010, CRPD /C/KEN/1, para. 105. 3 April 2012.

85 Child Poverty in Tanzania report, 2016

86 Combined fifth and sixth periodic reports submitted by Rwanda under article 44 of the Convention, para. 63, 10 July 2018.

4.3. National and city-level transport and urban development policies to improve accessibility to education and healthcare opportunities

Awareness of the role of transport connectivity and improved transport and land use planning coordination is noted in nearly all of the Government-level – both national and city-specific, where available – policy documents and future strategies. Similarly, human capital development, to be achieved through better access to schooling and healthcare opportunities, is nearly unanimously part of national level Vision documents and metropolitan master plans. At the same time, the differential education and healthcare access needs of the more vulnerable society groups – and hands-on strategies on how to serve them – receive more variable attention, and analysis of the existing spatial patterns of exclusion is not commonly reflected.

The National Study for "Burkina 2025" (Conseil National de Prospective et de Planification Strategique, 2005) was developed to analyze the past and current economic, social, political and cultural situation of Burkina Faso, and to determine the future development mechanisms. The Vision 2025 for Burkina Faso is a nation that is inclusive of all groups, especially the most vulnerable, and that ensures access for all to quality education and health services. The National Health Policy (Ministère de la Santé, 2011) presents a vision that is aligned with the National Study for "Burkina 2025"; moreover, it notes that its goal is to support Burkina Faso in achieving its international commitments, including those envisioned in the Universal Declaration of Human Rights, such as by ensuring universal access to healthcare and improving health services for vulnerable groups. The earlier National Health Development Plan 2001-2010 (Ministère de la Santé, 2001) specifically acknowledged the limited financial and geographic access to health services and defined specific targets with respect to the most basic healthcare facilities: in rural areas, there should be a Health and Social Promotion Center (CSPS) within a 10-km radius; in urban/dense areas, one CSPS should be available for 10,000 people.

The National Plan for Economic and Social Development 2016-2020 (Government of Burkina Faso, 2016) has three strategic axes, including development of human capital. Specific strategic objectives include the promotion of population health and acceleration of the demographic transition, which is expected to guarantee access to quality health services for all. Another objective is to increase the supply and quality of education, including access to quality higher education. Burkina Faso's Basic Education Strategic Development Program 2012-2021 proposes providing universal, free and obligatory access to ten years of education (Ministère de l'Enseignement de Base et de l'Alphabétisation, 2012). The Sectoral Program for Education and Training 2012-2021 (Ministères en Charge de l'Education, 2013) goes further in recognizing the role of transport accessibility in reaching education goals: under the theme of access to formal education and training, the document notes the need to improve the study conditions for students, including transport to schools; with respect to higher education, it proposes acquiring dedicated bus transport.

The National Housing and Urban Development Policy (Ministère de l'Habitat et de l'Urbanisme, 2008) envisions that urban planning should provide people with access to transport infrastructure, education and health facilities, while recognizing the lack of sufficient human resources to implement urban planning policies, the lack of coordination among urban stakeholders, and the poor implementation of urban planning guidelines. In 2014, the Ministry of Housing and Urban Planning hired a consultant with funding from UN-Habitat to work on the "Preparation of the National Habitat

III Report" of Burkina Faso (2015). Among the issues addressed by the report were the need to respond to the needs of the youth in the urban environment, the needs of the elderly, and the need to integrate gender equality in urban development, including by removing barriers for girls to enroll in- and complete- school. Finally, the National Urban Mobility Policy 2030, which is part of the current National Economic and Social Development Plan (2016–2020), intends to improve access to not only economic opportunities but also health and education services for as many people as possible. To this end, the Commune of Ouagadougou has developed an Observatory for Urban Movement, a mechanism of coordination and collaboration that aims to centralize information regarding the mobility practices of the city's residents and brings together various transport stakeholders.

Vision 2035 for Cameroon (Ministry of Economy, Planning and Regional Development, 2009) aims to, among other things, improve and expand the provision of social services, including education and health. The Vision recognizes that population growth puts pressure on the provision of social services and this pressure is more evident in the urban context. Key identified needs include the improvement of the quality and quantity of the education services and in particular to facilitate access to primary education for the poorest sectors of the population. Other goals include expanding the availability of health services and strengthening the role and financial independence of women and other groups living in vulnerability. Covering the first decade of the Vision's timeline, the Government of Cameroon developed the Growth and Employment Strategy 2010-2020 to serve as a integral framework of development, among others, noting the poor state of the roads. The Strategy's human development objectives include the provision of universal access to healthcare and improved access to basic education. Further, the National Development Strategy 2020-2030 (Republic of Cameroon, 2020) provides guidance for the second phase of Vision 2035, defining the development of human capital as one of its pillars and recognizing the continued issues with mobility and access in urban areas, despite the efforts of the past decade. While mostly focusing on improving access to basic services in rural areas, to reduce the existing disparities among regions, the Strategy sets targets that also apply to cities, specifically, a 100-percent rate of achievement in primary education and ensuring the functioning of 80% of intermediate and peripheral health facilities.

The country's Health Sector Strategy 2016-2027 (Ministry of Public Health, 2016a) states the vision of universal access to quality health services ensured for all social strata by 2035, with the full participation of communities, with its first guiding principle being equity in geographical, financial and cultural access to health services. In its assessment of the 2001-2015 Health Sector Strategy, it mentions the failure in some indicators including the large spatial gaps in the share of districts serviced by health centers and the continued high maternal mortality, which was aimed to be reduced but in fact increased between 2004 and 2011 from 669 per 100,000 live births to 782. The Strategy acknowledges the importance of the spatial distribution of care and the difficulty of physically access. Similarly, the National Health Development Plan 2016-2020 (Ministry of Public Health, 2016b) recognizes that inadequate physical access to services contributes to the poor performance of some of health indicators, for example, delivery assisted by professionals. Similarly, Cameroon's Education and Training Strategy 2013-2020 (Republic of Cameroon, 2013) defines "access and equity" as one of its guiding principles, specifically, the objective of improving access and equity at all levels of education. Specifically, it defines measures to ensure attendance to school of vulnerable populations considering their

levels of poverty, their place of residence and their gender (among others, proposing to study the possibilities of providing dedicated transport or boarding options); increase rates of pre-primary enrollment; construct and rehabilitate educational facilities, etc.

The Strategy for the Development of Douala and its Metropolitan Area (Republic of Cameroon, 2009) builds on ten strategic axes, including among them the need to improve accessibility of and to neighborhoods and public services. However, the document does not go further into the topic of physical access to schools or health centers. The Agenda Douala 2021 (Douala Urban Council, 2010) document, which is intended to be continuously updated, sets as objectives the promotion of clean transport and sustainable mobility, including cycling and the use of public transportation; development of support systems for vulnerable groups; and improvement of access to municipal buildings and other services to people living with disabilities. Another guiding document for the city is the Development of a Transport Plan and Urban Travel For Douala (Ville de Douala, 2009); however, for accessing social services specifically, it only notes the need for traffic calming measures around schools.

Mali's Strategic Framework for Economic Recovery and Sustainable Development 2019-2023 (CREDD) defines the country's vision of "inclusive growth and a structural transformation of the economy", recognizing the importance of mobility issues in urban areas (see Ministry of Economy and Finance, 2019). CREDD aims for a process of wealth creation that is inclusive and respectful of the environment and values human capital, especially benefiting the youth and women. CREDD acknowledges the current situation in the country as unequal and characterized by difficult access to health and education services, partly due to the prevailing security situation. Mali also has a National Urban Mobility Policy 2030 that it is closely aligned with CREDD and aims to improve urban living conditions and mobility. This policy is targeting the problem from a multimodal approach in which urban planning and mobility are done in coordination. It acknowledges the gaps in considering non-motorized modes in urban planning and seeks to rectify this by giving importance to creating secure pedestrian routes. The National Transport and Road Infrastructure Policy (NTP) acknowledges that the enabling role the transport sector plays in Mali's development, through promoting people's access to social services, among others (Republique du Mali, 2015). The NTP's strategic objectives includes the provision of access to health centres and the improvement of public transportation via increasing its capacity, the coordination of the different systems, and attracting more people (i.e. through differentiated tariffs catering to different population groups).

The National City Policy of Mali notes the role of the lack of basic infrastructure and education and health facilities in the use of residential facilities as education/health centers and the streets as playgrounds, which affects not only the health and safety of children but also the mobility of the populations (see Republique du Mali, 2014). The Policy also points to the inadequate roads and public transportation as a general problem in urban centers. For people with disabilities, the Policy acknowledges the lack of guidance in facilitating their easy access to public places and transport services. As its General Objective number one, the Policy notes improving access to education and health services and to transport, including by identifying and adopting modes of public transport that are adequate for Bamako and by creating road spaces (lanes) for the circulation of motorcyclists and cyclists.

Mali's Ten Year Health Plan 2014-2023 notes as among the main issues affecting the sector the spatial gaps in

access, as only 42% of the population has access to a health facility within 5 km radius, and only one in three people seek medical consultations. To promote the use of health services, the Plan proposes increasing the coverage of health care and looking for alternatives to cover more women and more of women-related issues (see Republique du Mali, 2014b).

Human capital is among the six pillars of Guinea's Vision 2040 (see Republique de Guinee, 2017) as a necessary driving force of the country's development, with intermediate objectives including equitable access to a quality education for all and a healthy life for every Guinean. The National Health Policy (Republique de Guinee, 2014) has a Vision of a Guinea with "universal access to high-quality, fully inclusive health care and service," with specific priority areas including the need to increase availability, access, quality and coverage of maternal care; and to strengthen community based initiatives and multi-sectorial interventions to reduce the exclusion of certain population groups. Similarly, the Government's 10-Year Education Program for 2020-2029 puts emphasis on inclusive development of human capital. The Program stresses the need to increase the coverage of education services to reduce inequalities of all types (gender, spatial, etc.); however, it does not explicitly mention the role of physical accessibility, instead, suggesting school meals as an effective tool for increasing enrolment and retention of children, and the need for improvement of classrooms and toilets to accommodate children with disabilities (see Republique de Guinee, 2019b).

Guidance documents at the city level include the Urban Mobility Plan for Conakry (Republique de Guinee, 2019a) and Grand Conakry Vision 2040. While the Plan does not explicitly mention access to schools or health centers, it places emphasis on planning for pedestrians and their travel needs, by providing the necessary infrastructure and enforcing its protection for pedestrian use, such as by not permitting informal vendors to occupy sidewalks or the sidewalks to be used as parking spots. These policy document notwithstanding, there is a need for mechanisms to align and delimitate responsibilities and coordination among the Ministries and institutions in charge of the different themes (SSATP, 2018a). Strategic initiatives have also seen a mixed record of implementation, are not always well known to the authorities, and sometimes lack the supporting policies in place to be executed (World Bank Group, 2019).

Tanzania's Vision 2025 aims to guide the nation to a middle-income country that is educated and highly productive and that brings opportunities for all, including people with disabilities. Among the targets, the Vision 2025 aims to realize universal education, gender equality and empowerment, access to quality primary health care and quality reproductive health services, and an adequate level of physical infrastructure. Tanzania's Five Year Development Plan II (FYDP-II 2017/18-2020/21) is aligned with the Vision 2025 and contains several objectives for enhancing the country's human capital, through diverse mechanisms such as matching of skills and market needs, high quality of life, and quality of education, and with specific targets for enrolment and students passing exams (The United Republic of Tanzania, 2016a). To achieve this, Tanzania recognizes it needs to improve the teacher-student ratios and the learning and teaching environment. In the health sector, FYDP-II aims to improve service delivery and reduce the share of people traveling long distances to health facilities from 36% in 2014/15 to 15% in 2025/26.

Tanzania's National Transport Policy (see The United Republic of Tanzania, 2013a) sets the direction for the management of transport in urban areas, with strong focus on reducing congestion around the business

district, and recognizes the role that transport plays in enabling access to education and healthcare. The 2017 update acknowledges that, regardless of the introduction of the BRT in Dar es Salaam, the characteristics of commuting in Dar es Salaam are still poor, with congestion, pollution, poor road safety, and lacking of provisions to accommodate pedestrians and cyclists (see United Republic of Tanzania, 2017). Regarding land use planning, the Policy recommends to allocate facilities such as schools and other amenities close to residential areas. It also specifically speaks about transport for disadvantaged groups in urban areas, such as students, the elderly, and people living with disabilities, recommending that the Government, communities and operators contribute to solving the mobility issues for these groups without jeopardizing the commercial aspects of the service. The guidance for public vehicle design, moreover, specifies that public transport should be able to accommodate safely and with comfort all users, including those belonging to disadvantaged groups.

The Dar es Salaam Transport Policy and System Development Master Plan, now over a decade old, focuses mostly in large-scale infrastructure interventions, while also recognizing the dependence of many of the city's residents on walking and public transportation. It proposes several policies, such as "Pedestrian and Non-Motorized focus development and Urban Road Development", "Public Transport Oriented Development', and "Accessibility and Mobility to all" (see JICA, 2008).

Among the priorities defined under the social transformation pillar of the Rwandan Government's National Strategy for Transformation (NST) 2017-2024 are ensuring access to quality health for all, and increasing access to and improving the quality of education (see Republic of Rwanda, 2017a). NST 2017-2024 focuses on Economic Transformation, Social Transformation, and Transformational Governance as its three pillars. The Social Transformation Pillar provides the framework to enable Rwandan citizens to develop their capacities and skills, including by ensuring access to quality health for all; specifically, this goal is expected to be achieved by constructing and upgrading health facilities. The same Pillar also includes an education goal, specifically focusing on increasing pre-primary enrollment and decreasing drop-out rates. While it does not mention tackling barriers related to traveling to school, the document notes that special attention will be paid to people with disabilities to be able to access education and that the education facilities have adequate infrastructure (i.e. sanitation facilities). The United Nations Children's Fund (UNICEF) is working closely with the Government to implement its Education Sector Strategic Plan 2018/19–2023/24, with a focus on three key areas: (1) increasing access to education for vulnerable groups; (2) quality of education; and (3) increasing access to quality pre-primary education. There is also a consistent focus on ensuring gender equity and inclusion in all efforts. Participation of education has improved, as evidenced by an increase in access to pre-primary education and a reduction in dropout rates. In 2017, more than 20,000 refugee children, children with disabilities, and out-of-school children had opportunities to access quality education in an inclusive environment.

Rwanda's National Urbanization Policy (NUP) (Republic of Rwanda, 2015a) provides a framework to that aims to guide urbanization in the country based on principles of sustainability, resilience, inclusivity, participation, and flexibility. Its four pillars, namely coordination, densification, conviviality and economic growth, are also embedded in the Master Plan for Kigali of 2018 (Surbana Jurong Consultants Private Limited, 2018). The NUP does not directly speak to the connection between transport and access to services; however, its Conviviality Pillar states that as part of the urban quality of life, the residents should have easy access to education and

health facilities. It also brings a strong angle of inclusivity and women's empowerment by bringing the diverse urban groups into the planning discussion to address their needs.

The Kigali Master Plan, updated in 2018, builds on three components: green and efficient city, inclusive city, and vibrant and productive city. Among the issues identified in the Plan is also the need to reduce existing disparities in live quality and the lack of physical and social infrastructure, with the envisioned approach based on inclusive development and consultations reaching all members of the city's diverse community, including vulnerable populations. It estimated that approximately 60% of Kigali's urban households live in substandard conditions, with poor access to health and education services and infrastructure, mainly derived from their location in unplanned settlements. It also acknowledged the disproportional burden of road accidents on the most vulnerable road users, with 71% of accidents in Kigali involving a pedestrian, cyclist or a motorbike. The Vision 2050 for Kigali, described in the Master Plan, proposes Kigali's living standards to be increased through "faster, inclusive urbanization and greater agglomeration", emphasizing the importance of urban mobility and public transport.

In the education sector, the Vision 2030 for Zimbabwe "towards a prosperous and empowered upper middle income society by 2030, with job opportunities and a high quality of life for its citizens" focuses on the improvement of curricula, STEM, and facilities for tertiary education, also noting the need to develop special needs education and adult training (see Republic of Zimbabwe, 2018). In the health sector, priority is given to preventative care and bringing services closer to communities by decentralizing services from Referral to Provincial, and from there to District Hospitals. The country's Roads Act establishes as an important goal the accessibility of centers of social and economic importance through the development of the road network, with the participation of road users, including the civil society (see Parliament of Zimbabwe, 2002).

The United Nations, The World Bank and the African Development Bank, responding to a request from the Government of Zimbabwe, in 2019 conducted an exercise to assess the needs to be addressed over time. In terms of specific policy needs, This Joint Needs Assessment for Zimbabwe (JNA) points to the finalization and implementation of the Education Act and the development of a Strategy for Post-Secondary Education. In the health sector, the JNA highlights the need to revise the country's Health Financing Strategy, specifically the user fee policy for vulnerable population groups. No policy documents regarding health and education access and/or the role of transportation are available specifically for Harare.

Kenya's Vision 2030 is to become a 'globally competitive and prosperous nation with a high quality of life', in part, by investing in people (see Government of the Republic of Kenya, 2007). Vision 2030 sets goals of increasing enrollment rates and transition rates to technical schools and universities, to reform the curriculum for secondary education, to develop key programs for learners with special needs, among others, and to strengthen education infrastructure. In the health sector, it envisions the revitalization of community health centers to promote preventative healthcare and to support disadvantage groups (youth and economically vulnerable households). The Vision also notes that it is imperative to provide convenient and efficient transportation that cuts commuting times and transport costs, and to provide for the specific needs of women in the working class, such as by expanding the availability of childcare facilities. The National Urban Development Policy, formally endorsed in 2016, envisions Kenya to

have well-governed, competitive, and sustainable cities that contribute to the achievement of the broader national development goals articulated in the Constitution and Vision 2030. The Policy aims to facilitate sustainable urbanization through good governance and delivery of accessible and efficient infrastructure and services, based on the principles of inclusivity, connectivity, and livability (adequate quality services and infrastructure). The National Spatial Plan (2015-2045) guides Kenya's spatial development and is aligned with Vision 2030. The NSP recognizes the need to improve accessibility and recognizes the role of transport as a catalyzer for other sectors. The National Integrated Transport Policy has identified challenges for users and a plan for more accessible infrastructure.[87] Additional regulations from 2009 require various modifications to traffic signals and on the pavement for improved access.[88]

Nairobi Metro 2030 (Government of the Republic of Kenya, 2008) is the Nairobi Metropolitan Region's guideline to achieving high quality of life and sustainable wealth; its building blocks also include optimizing mobility and connectivity through effective transportation and enhancing inclusiveness. The document recognizes the challenges in the region, such as poor mobility and connectivity, which translates into poor and expensive transport services and, therefore, poor quality of life and access to basic services, such as education and health care. Nairobi Metro 2030 sets the goal of a transit-oriented development structure for the city, aiming to fully integrate mobility planning into the land use planning and development processes, and considering the social profile of the residents. The document also notes the objective of developing an integrated institutional framework for transport management that ensures affordability and cost effective modes of transport. The Integrated Urban Development Master Plan for the City of Nairobi (JICA, 2014a), similarly, presents a vision for the city's CBD as a compact urban center that is bot efficient but also inclusive. Finally, in 2015, the Non-Motorized Transport Policy for Nairobi was launched, which, among others, acknowledges the data gap on the importance of NMT modes for different users (see Nairobi City County Government, 2015). The Africa Transport Policy Program's assessment recognizes the steps Kenya has already taken towards improving urban mobility and access (see SSATP, 2018b). As an example, in 2017, the Nairobi Metropolitan Area Transport Authority was established with the mandate to "regulate and oversee the establishment of an integrated, efficient, effective and sustainable public transport system within the Nairobi Metropolitan Area".

As part of Uganda Vision 2040, the country has plans to develop five regional cities: Kampala, Gulu, Mbale, Mbarara, and Arua (see The Republic of Uganda, 2010). For the Greater Kampala Metropolitan Area (GKMA), Uganda envisions that by 2040 it will be providing high quality public transport and a complementary non-motorized transport network. Urbanization in the GKMA has been characterized by uncoordinated planning and developments leading to sprawl. Therefore, the Government aims to develop and ensure implementation of physical Master Plans that drive the development of the GKMA, which will take into account considerations of provision of social amenities, including education and health. The Vision 2040 recognizes that previous efforts to promote gender equality and women's empowerment have yield positive results, but are still insufficient. Therefore, it puts a stronger focus on targeted policies,

87 Consideration of reports submitted by States parties under article 35 of the Convention Initial reports of State parties due in 2010, CRPD /C/KEN/1, para. 103. 3 April 2012.

88 Consideration of reports submitted by States parties under article 35 of the Convention Initial reports of State parties due in 2010, CRPD /C/KEN/1, para. 105. 3 April 2012.

strategies and programs that facilitate the participation of women in the development process, including flexible working conditions. With respect to Education, Uganda's Second National Development Plan (2015/16-2019/20) identifies several sector constraints, including shortage of critical infrastructure and overcrowding but does not to mention distance or access to education centers as a key issue (The Republic of Uganda, 2015).

The Ugandan Ministry of Works and Transport's National Transport Master Plan 2008-2023 for the country and the GKMA identified several challenges, some of them associated with the lack of regulation in the sectors linked to transport, such as land and governance (see The Republic of Uganda, 2008). For example, it recognizes that the lack of structural planning is one of the causes of the rapid increase of urban sprawl along the main radial routes, that city dwellers walk long distances to access public transportation and that pedestrians, non-motorized transport (NMT) and trips made through these modes were not taken into account when designing roads and infrastructure.

Kampala Capital City Strategic Plan 2020/21-2024/25 (KCCA, 2020), which includes "enhanced quality of life" as one of its core pillars, envisions access to all basic services; this also entails that accessible and affordable transportation systems, either roads or pedestrian infrastructure, are accessible to everyone, allowing to "to move around the city quickly and comfortably". The strategic objectives of the Plan include (1) improving the lives of vulnerable groups, (2) improving the quality of educational opportunities, and (3) improving public health and environmental management. Specific commitments under the second objective include the identification of the barriers for completion of secondary education (including gender-related) and implementing mitigating solutions. Activities defined as necessary to reach the third objective include expanding and improving quality of, and access to health services, although physical access is not mentioned explicitly. Transport issues are addressed under a different Pillar of the Plan, namely "City Economic Growth," where the Plan aims for the implementation of multi-modal urban transport solutions to address congestion, a key challenge mentioned during the stakeholder engagement undertaken during the preparation of the Plan. The Kampala Physical Development Plan, similarly, emphasizes the need to infrastructure planning to deliver a highly connected transport network and accessible social services.

In terms of access of education, according to the KCCA, 65% of the traffic congestion in Kampala is caused by school-related traffic, due to the location of the top performing schools in City Centre. To respond to this issue, the KCCA, under the Kampala Model School Project, is considering to support the relocation of some of the City Centre schools to residential areas to ensure easier access. This is aligned with the Kampala Physical Development Plan, were a goal of creating a new hierarchy of organized and accessible services is envisioned, among other objectives.

Human capital is extensively emphasized in Mozambique's Agenda 2025, the country's strategic vision prepared in 2003 (see Comité de Conselheiros, 2003), of which health and education are noted as fundamental components. In this regard, the document acknowledges the importance of extending the coverage of health and education services and of having an efficient patient transport system among health facilities. The document provides strategic options for the provision of schools providing Upper Primary Education, noting that at least 50% of the spaces available for students should be for girls and that incentives need to be put in place for families to continue sending girls to school. The Agenda also envisions creating schools for

children with a physical or mental disabilities. The role of transport services is acknowledged in the document with respect to providing access to jobs and facilitating the satisfaction of basic need, specifically encouraging NMT. Development of human capital is also among the pillars of the National Development Strategy (END 2015-2035, Government of Mozambique, 2014), emphasizing the need to adopt land-use management plans that ensure access to quality services. While it does not mention lower levels of education, the END refers to the importance of promoting access, equity and expansion of coverage of technical and vocational education. Also the Government's current Five Year Program (Government of Mozambique, 2020) defines as its first priority the Development of Human Capital and Social Justice, recognizing the current gaps and the need to, among others, promote an inclusive education system; increase access to health services; and promote gender equality, social inclusion and protection of the most vulnerable populations. This is consistent with the National Strategy for Basic Social Security 2016-2024 (Government of Mozambique, 2015), which aims to contribute to the development of human capital through improving access to education and health for the poor and the most vulnerable and defines priorities in the health sector of particular importance to women, such as increasing the quality of the so-called *Casas de Espera para Mulheres Grávidas*.[89] It is also consistent with the vision of the Health Sector Strategic Plan 2014-2019 (Ministry of Health, 2013) which aims to "progressively achieve Universal Health coverage enabling all Mozambicans, especially the most vulnerable groups", through reforms and more and better services. The Plan delves into limited physical access and financial barriers (such as cost of transport) as determinants of the use of health services.

The country's Action Plan for Poverty Reduction 2011-2014 (Government of Mozambique, 2011) establishes as a strategic objective guaranteeing access to transport for urban users, minimizing distances and travel and wait times, through the liberalization of transport rates and putting in place protections for students for traveling to school and for other vulnerable groups.

As part of the Comprehensive Urban Transport Master Plan for the Greater Maputo (JICA, 2014), the shared vision for Greater Maputo was defined as "socially and environmentally sustainable urban transport systems facilitating the international gateway capital"; however, access or affordability are not explicitly mentioned. The Plan notes the role of public transport in increasing mobility and accessibility, along with the need to improve the use of road space and the pedestrian environment. However, the Master Plan has been criticized for paying little attention to chapas (minibuses) whose recent mapping provides an opportunity to better plan and integrate the various parts of the transport system in terms of access and equity (Klopp and Cavoli, 2019).

89 Waiting Homes for Pregnant Women: accommodations where pregnant women can wait and be closer to health centers to deliver safely.

5. Barriers to Health and Education Accessibility: The Categories Lens

Photo credits: Trevor Samson

5.1. Evidence from household travel surveys, and policy documents

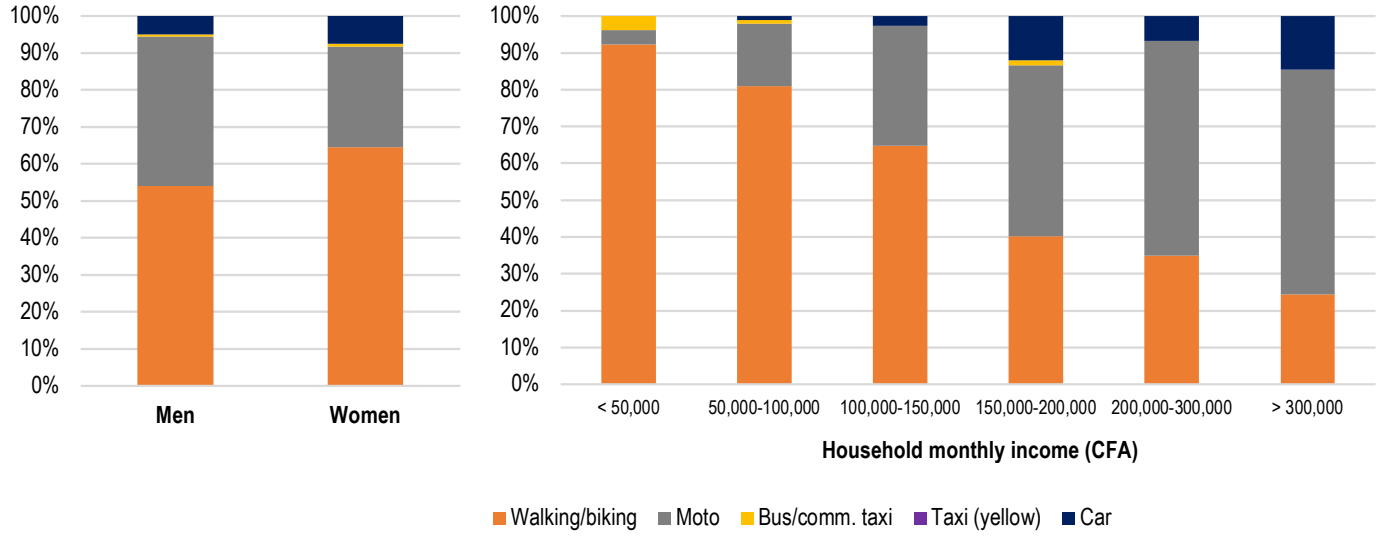
5.1.1. Transport distance as a barrier for some groups

Across the cities where detailed survey data is available, albeit sometimes not directly comparable due to its variable recently, distance to facilities represents a major obstacle to schooling and to seeking care. However, it is one of several challenges households face, with affordability – of transport but, more so, of the health and education services themselves – playing an equally important role.

To better understand the connectivity constraints faced by Ouagadougou residents for accessing key social services and facilities, a field survey as part of this study was conducted in the city in June, 2020, altogether surveying 2,086 individuals. The survey asked a number of questions regarding the general role of transport constraints in the individuals' ability to access healthcare opportunities and, for those who have children in primary or secondary school, ability to access education facilities. The vast majority of respondents (71%) typically use a motorcycle or a scooter to reach health facilities. Only a slightly greater share of women than men rely on walking and biking (10% vs. 8%); however, modal shares differ more significantly across the household income spectrum, with walking and biking dominating in the low-income groups but being entirely absent in the upper ones.

Over one in five respondents report distance/ availability of transport as either *the* most important constraint or one of the main constraints in accessing healthcare: 19% of men and 22% of women. As a comparison, the share of women aged 15-49 in Ouagadougou reporting distance to health facilities as a barrier to seeking healthcare was 34% according to the most recent available Demographic and Health Survey for Burkina Faso (now a decade old) (see Burkina Faso, 2010).

Figure 1: Travel by children to school, by mode, in Ouagadougou (by parent gender and household income)



Source: Survey in Ouagadougou by SATREC, 2020

Transport availability/ distance presents a much more common constraint to accessing healthcare services for the poor compared to the better off, with 38% of respondents in the lowest-income group saying it is the most important or one of the main constraints. However, it represents a constraint even for many of the upper income respondent and is more concerning for older respondents compared to younger ones.

About one-third of Ouagadougou residents report using a motorcycle or scooter to transport their children to school, slightly less than those who bike. Walking is also a common mode, reported by 27% of the respondents. Looking at differences by gender in this case is not as meaningful, as the survey does not record the child's gender but only the parent's. Nevertheless, some differences in modal shares emerge, with women reporting their children using a bike or walking more commonly than men (65% vs. 54%). As with attending to regular medical needs, also with regard to children's travel to school the poorer households rely on walking and biking much more than the upper-income ones. In the lowest-income group, children walk or bike to school in 92% of the cases, compared to 24% in the upper-income group. Still, unlike in the case of travel for regular medical needs, walking and biking are important modes for children to get to school even for the better-off households, which may be explained by the fact that households send their children to schools relatively nearby, given the relatively dense distribution of primary and secondary schools in Ouagadougou, but this is not always possible with medical facilities.

Nearly one in four respondents say that distance/availability of transportation is *the* main constraint or among the main constraints affecting the frequency of their children's schooling. Female parents are more likely than male ones to perceive transport availability as an important constraint (26% vs. 22%), perhaps reflecting the fact that it is more commonly the households' women who are responsible for bringing the children to school. In contrast to travel for regular medical needs, the availability of transportation as a constraint for children to frequent school is not clearly related to household income, possibly again due to the wider availability of schools in the respondents' immediate neighborhood, regardless of income.

In Douala, residents perceive travel time as the main issue of traveling in the city (15%), approximately the same as the share of those who are worried about road safety issues, difficulties to find a vehicle, and transport cost. For about 9% of the residents the main issue is the access to a transport service by walking, which is more prevalent among the low-income residents (likely because they have to walk further to find any public transport options). Low-income residents of Douala are also disproportionately more concerned about long travel times and ability to find a transport vehicle (Douala Household Survey, 2018).

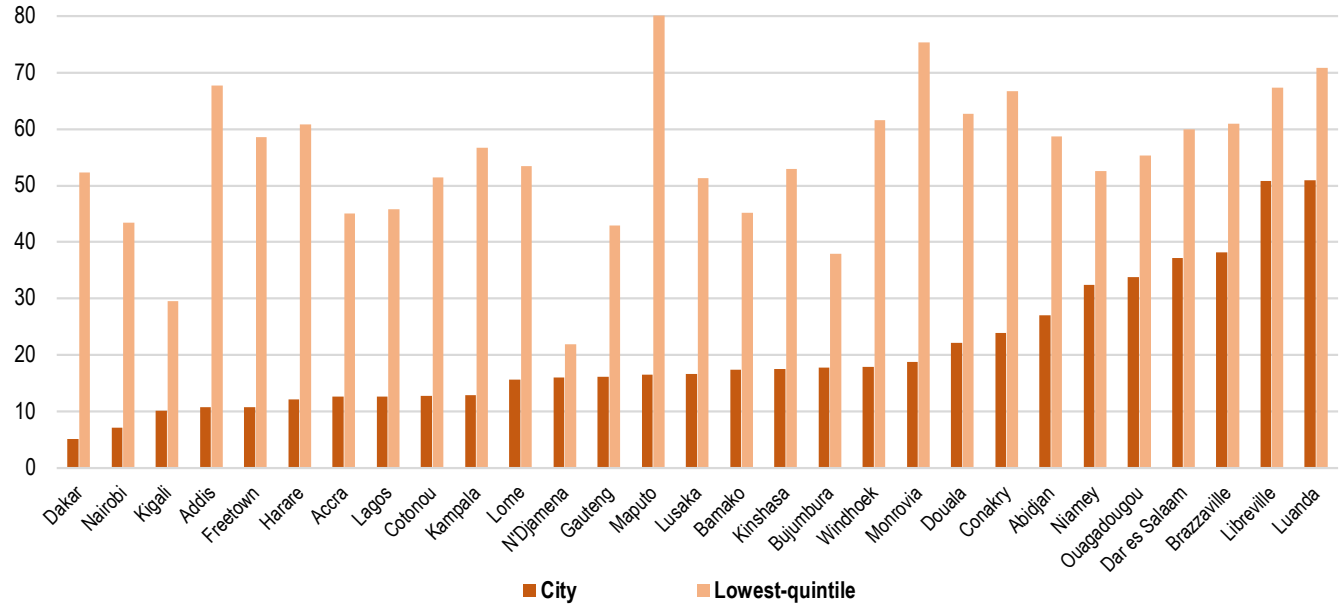
A study by SSATP (2004a) estimated that most trips to school are made on foot, also identifying the barriers for this mode: obstruction of sidewalks, poor condition of roads, and bad smells. In discussing the reasons for gaps in school enrollment between the poor households and the non-poor, which are more manifest in the 6-9 and the 14-21 age groups, the study suggests that the inadequate supply of public schools implies that distances to public schools are longer than to private ones (more widely available); however, the cost of private schools can be a deterrent for the poor to enroll their children. The study found that almost all children in primary school get to school by walking; 22% of children of poor households in who are in public schools and 13% of those who are in private schools have to walk more than half hour each way. At the secondary school level, while walking is still the main mode

of transport used to reach schools, children from poor households are more likely to walk than from non-poor households, especially so among the poor children who attend private secondary schools: 84% of children in poor households enrolled in private secondary schools walk versus 56% of children in private schools from non-poor households. The difference is not as wide when comparing poor and non-poor children enrolled in public secondary schools (71% vs. 65%).

According to baseline analysis underlying Cameroon's Growth and Employment Strategy 2010-2020, in the health sector, there is wide availability of informal health services and other structures that offer cheaper services. While the problematic of accessing health services is mentioned more in relation to rural areas, also for the urban areas the document expresses the need of having 'mobile health teams' that can access the populations in need. In Douala, over 22% of women aged 15-49 report distance as the constraint for seeking care at health facilities, while in the country's other major city, Yaoundé, the share is 26% (Republique du Cameroun, 2018).

Because of lack of supply of the public healthcare services, about three-quarters of all households visit private facilities and less than half visit public facilities. When accessing the services by public transportation, 9% of Douala's poor households were estimated to ride for more than half hour to access either a public or a private center (SSATP, 2004). When accessing the next level of care, hospitals and clinics, walking is not prevalent; about one-third of the poor households reported riding public transportation for more than half hour when accessing public facilities, and 48% when accessing private facilities; for the non-poor households the

Figure 2: Distance to health facility as a barrier for seeking treatment at health facility in past 5 years among 15-49 year old women: in largest cities vs. among lowest-wealth quintile in country overall (%)



Source: Countries' most recent available Demographic and Health Surveys (DHS)

respective shares were lower – 26% and 25%. While access is not commonly cited as a concern in seeking more advanced healthcare services given that the cost of the actual care is what concerns dwellers the most, it does feature more frequently among the poor.

In Bamako, walking is the mode of transport for more than half of all trips (SSATP, 2020b). The average number daily trips per person (3) is among the lowest in West Africa, and over half of all trips that do take place are short distance. Most trips (57%) in the city are made on foot, 17% by bus, and 9% by car, although data is not available on the differences by gender. For accessing healthcare, distance to the facilities is mentioned as a major constraint by 17.4% of women aged 15-49 in the city, behind getting the money to pay for the services and getting the permission to seek treatment (Republique du Mali, 2019). While disaggregated data was not available for Bamako, in Mali overall distance to school is named as a reason for never attending a formal school by about 10% of children and young adults aged 7-24. Among children ages 5–10, girls are less likely than boys to visit a clinic or other health facility when they experience an illness (42% versus 49%), which may reflect a lower priority being given to girls' health (World Bank, 2020).

The mobility of Conakry residents is low, at only 1.8 trips per person per day, and traveling on foot is common, accounting for about 70% of trips in urban areas. At the same time, despite the importance of walking as an access mode in Conakry, the provision of infrastructure and policies have been lagging that would make travel on foot safe (SSATP, 2018a).

Based on data from 2012, approximately 10% of Guinea's urban poor spend between 30 and 44 minutes to even reach public transport (Republique de Guinee, 2016). Poor households spend 19% of income on urban travel alone; the burden exceeds 30% of income for one-quarter of poor households, and expenditure on public transport is 20% higher if they live in the outer suburbs (see SSATP, 2004b). The same study reports that the city's pedestrians face numerous issues, including bad smells, garbage, and filth; poor road conditions; and obstruction of sidewalks. An overwhelming share of the poor household students in Conakry rely on walking to get to school: 96% among primary school students, 61% and 75% of secondary school students enrolled in public and private schools, respectively. About a fifth of children from poor households enrolled in public school walk half hour or more to reach school. Among children from non-poor households, a much smaller share, though still very large, depends on walking to reach school – about 45% of those in public schools and 56% of those in private ones. This is explained by the fact that, because they are more abundant, private schools are more likely to be in the same district as the residence than public schools. According to this same study, albeit now over 15 years old, half of the children in Conakry have to go to city center to attend school, but the location is directly correlated with the grade. Among primary school children, 59% attend a school in their district and another 29% in an adjacent district, and the share of the trips to primary school made by foot is as high as 94%. To attend secondary school, 60% of children have to travel beyond even any adjacent district, and the share reaches 88% among high-school students. At the secondary school level, even children from non-poor households travel longer if they are in public school (31 minutes one way) than if they are in private school (22 minutes). Finally, the same study also found that, while both male and female primary and secondary school students cited bad smells, garbage, and filth as the main problem when walking, the second most mentioned issue among girls was risk of assault, while it was mentioned by less than a third of the male pupils.

Dissatisfaction with schooling in Conakry mostly relates to excessive fees, crowding, and lack of books/furniture, and regarding the reasons for not attending school, only 0.7% of children aged 7-19 mention distance, according to a 2012 Government survey. Similarly, distance to health centers was named only by 0.1% of respondents as a reason for not seeking healthcare, while a considerably larger share (4.9%) named cost (Republique de Guinee, 2012). However, these findings are in contrast to those of the most recent Demographic and Health Survey for Guinea (2018), which found that nearly a quarter of women aged 15-49 in the city find distance to be the barrier for not seeking treatment at a health facility.

The share of the poor in Conakry who walk to seek primary healthcare – at least according to the 2004 data – is high in the case of lower-level health facilities such as health centers and dispensaries that are more widely distributed: among poor households, 72% walk to public facilities and 79% walk to private ones (SSATP, 2004b). These types of facilities appear to be accessible, given that the average time spent by poor households to reach the health facility by any mode of transport is between 22 and 25 minutes, depending on whether the facility is public or private. However, about one-third of poor households and 17% of non-poor ones do not use any healthcare services in either public or private hospitals, which there are much fewer. Of those who do use hospital care, the vast majority choose public facilities and tend to travel by *magbanas*. Across all modes of transport, poor households spend an hour traveling to a public hospital, and 44% have to ride public transport over an hour to reach it. The travel time to a public hospital for poor households was estimated to increase progressively as their residence moves spatially outward – from an average of 28 minutes for those who live in the city center to 113 minutes for dwellers of outer suburbs.

At the national level, 24% of Ugandan households have a bicycle, 8% a motorcycle and 3% a vehicle. However, male ownership of bicycles is almost 5 times higher than women's and ownership of motorcycles – as much as 18 times higher (UBOS, 2018). Nearly three-quarters of households in Uganda live within 5 km of a health facility; in Kampala specifically, the first point of entry for seeking healthcare is about 2.4 km to a Government Health Facility and less than a kilometer to a non-government facility (UBOS, 2016). Nevertheless, 41% of Ugandan women mention distance as a challenge to seeking medical services. In the education sector, the Ugandan Government considers an acceptable distance to travel to school to be 3 km; however, in Kampala, about 16% of school-attending children are reported to travel over 3 km. Between 9% and11% of communities cite long distance as a barrier to accessing health services, either private or public, and about 6% cite lack of transport (UBOS, 2018). Approximately 13% of Kampala's female residents aged 15-49 perceive distance to health facility as a problem to accessing healthcare (UBOS and ICF, 2018). In contrast, only about 3% of Ugandan children reported not attending school because of distance, and transport was not mentioned among the reasons for children to leave school.

In its analysis of the determinants of housing demand in Kigali, the Kigali Master Plan (2018) notes the importance of access to schools, with 60% of the children in Kigali traveling 1 km or less to reach their schools. Walk time to a primary school in the Nyarugenge and Kicukiro districts in 2013 was reported to be up to 29 minutes for about 80% of the children, but in Gasabo about 40% of the children have to walk half hour or more (see Rwanda Environment Management Authority, 2013). Also regarding access to health services, most residents of Nyarugenge and Kicukiro walk about 30 min to a health center, while most Gasabo residents spend between 30 and 60 minutes. Only one-fourth of transport users

report reaching a transportation hub within 20 minutes, which explains why the vast majority of commuters (70%) either walk or use motorcycle transport.

The Road and Public Transport Accessibility Study in Rwanda (Esri Rwanda Ltd, 2019) mapped public transportation stops across the country and estimated the number of schools and healthcare facilities located in close walking distance from the stops. Nation-wide, only a quarter of health facilities and only about one in twenty primary schools were estimated to be within 500 m of a bus stop. However, the study points out that primary schools are intended to serve a specific community and the need of public transportation to access primary schools is not be as relevant as it is for other levels of education. For Rwanda's secondary schools, the study found a slightly higher share (13% of Level A and 5% of Level O) to be within 500 m of a bus stop. In the country overall, the study estimated 4.2 million people (37% of the population) to live within 45-minute walk of a public transport stop, with Kigali outperforming the rest of the country. Distance presents a problem to accessing healthcare for about 8% of women aged 15-49 living in the country's urbanized areas, and for over10% of women in this age group in Kigali specifically (Republic of Rwanda, 2015b). Within Kigali, while only 3% of women aged 15-49 report this as a problem in Kicukiro, in Nyarugenge and Gasabo the respective figures are 12-13%. As a result of the overall high share of women who do not perceive distance to be an issue, delivery in health facilities across Rwanda is comparatively very high, ranging from 88% in the East of the country to nearly 91% in Kigali. Recent studies have also looked at the actual use of different health facility types for different purposes. These have found that, for example, most Rwandan children under the age of 5 are treated at a health center, and less than 2% - at a provincial or district hospital (Republic of Rwanda, 2017b).

Data on average distances traveled to school and the modal shares – in Zimbabwe or Harare specifically – is not available in recent Government surveys (for example, this information is not captured in the Educational Management Information System 2019). Regarding healthcare services access, the distance is perceived as a constraint by 12% of women aged 15-49 years old in Harare (Republic of Zimbabwe, 2016b); in Zimbabwe overall, female respondents have noted 'distance to health facility' as the second main obstacle to accessing healthcare after 'getting money to pay for health care', according to the Data Collection Survey on Health Sector (JICA, 2012). Similarly to Kigali, the rate of deliveries in healthcare facilities is relatively high – in Harare, about 78% are performed in a public hospital and 12% in a private one, and only 8% - at home.

The Kenya Urbanization Review of 2016 estimates that an average trip related to schooling in Nairobi takes 38 minutes, which, although high, is less than for other needs (World Bank, 2016a). Extensive surveys by Salon & Gulyani (2019) found that 74% of school children in Nairobi walk for most of their commutes and report walk times of between 10 and 20 minutes, while those who do not walk use matatus and incur longer travel times. According to an earlier travel survey conducted in 2013 (JICA, 2014a), even among children from households who own a private car, one fifth walk. About 7% of women aged 15-49 in Nairobi perceive distance as a problem for seeking healthcare (Kenya National Bureau of Statistics, 2015).

Gap analysis conducted in Nairobi by JICA (2014a), based on the guidance that for every 25,000 people there should be a health center, found there to be a shortage of 47 facilities. With respect to primary schools, where it suggests the need for a school for every 5,000 people and availability of a school within a 500-meter walk, the study identified a shortage

of more than 400 schools, especially in areas such as Mukuru Kwa Njenga and Kayole. For secondary schools, it proposed that a school should be available for every 25,000 people, with a walking distance of no more than 1 km, finding a shortage of 77 schools.

In the case of Dar es Salaam, distance does not figure among the reasons why children aged 7-13 do not attend school (The United Republic of Tanzania, 2013b). The same survey data, albeit now nearly a decade old, suggests reliance on walking to access school in the city (78% of children), followed by public transport (12%), private vehicles (4%), and biking (<1%). Among the primary school children who walk to school, the time required in Dar es Salaam is less than 15 minutes for about 90%. In contrast, children in O-Level secondary schools walk about 28 minutes; among those children who arrive to school by private vehicle or public vehicle, the average travel times are 49 and 46 minutes, respectively. Distance to the healthcare provider was not cited as a reason for not seeking care. However, about 37% of women in Dar es Salaam aged 15-49 perceive distance to health facility as an issue (see The United Republic of Tanzania, 2016b).

Mozambique's Agenda 2025 (Comité de Conselheiros, 2003) notes distance to school as a barrier to schooling, specifically interfering with the transition of students from EP1 (grades 1-5) toEP2 (grades 6-7). Almost half of all trips (45.9%) in the city are made by walking or bicycle, and trip to school represent the send most important trip purpose (JICA, 2014). Distance to health facility is a constraint to seeking healthcare for 16.5% of women aged 15-49 in Maputo City (Instituto Nacional de Estatística, 2013).

In other SSA cities where detailed household survey data is available, similarly, children appear to be overwhelmingly dependent on walking to reach primary school. For example, in Dakar, 94% of children who attend *daara* (religious school) or a public primary school reach school by walking, which is explained by the fact that the vast majority of children attend a school that is located within their residential neighborhood (see Republique du Senegal, 2015). Reliance on walking is lower among Dakar's private primary school pupils, of whom three-quarters walk to school. Among all the children attending daara, 12% report transport as a constraint for attending school, while the respective share among public or private primary school pupils is 4-5%. The average trip to primary school in Dakar takes about 14 minutes. At the secondary school level, less than half of students attend school within their own residential neighborhood; however, most of them (about three-quarters among public secondary school students and 56% among private school ones) nevertheless rely on walking to reach school. Across all secondary school students, the average trip to school takes between 17 and 22 minutes, depending on the type of school. Issues with transport as a constraint for attending school are reported by about 6% of all secondary school students, both public and private. Among all students under the age of 19, a very small share rely on public transport modes – buses, informal minibuses, communal taxis – to get to school; the figure is somewhat higher among girls than boys, with over 5% versus 3%, respectively.

Transport (including congestion) in Dakar does not appear to be a common constraint – at least relative to others – for accessing healthcare facilities, either. Here, the various modes of public transport, including formal buses, informal minibuses, and communal taxis, represent at least 10% of all trips (and over one-third of trips for accessing public hospitals specifically); however, less than 5% of respondents consider transport access to the health facility an issue. However, this figure is not fully consistent with the comparatively high share of all

Dakar residents – 10% - who say that they have foregone health-related needs due to transport constraints.

In Abidjan, the average trip to primary school lasts 16 minutes and is nearly the same across different household income brackets. About 94% of trips are undertaken on foot, and the share is the same for girls and boys but reaches 96% among children from the lowest income group (Republic of Cote d'Ivoire, 2013). Among secondary school students, about 63% walk, and also among the lowest-income households the share increases only slightly, to 67%. The average trip lasts about 21 minutes one way but ranges from 17 minutes for pupils from households in the highest income bracket to 23 minutes for pupils from the lowest-income households.

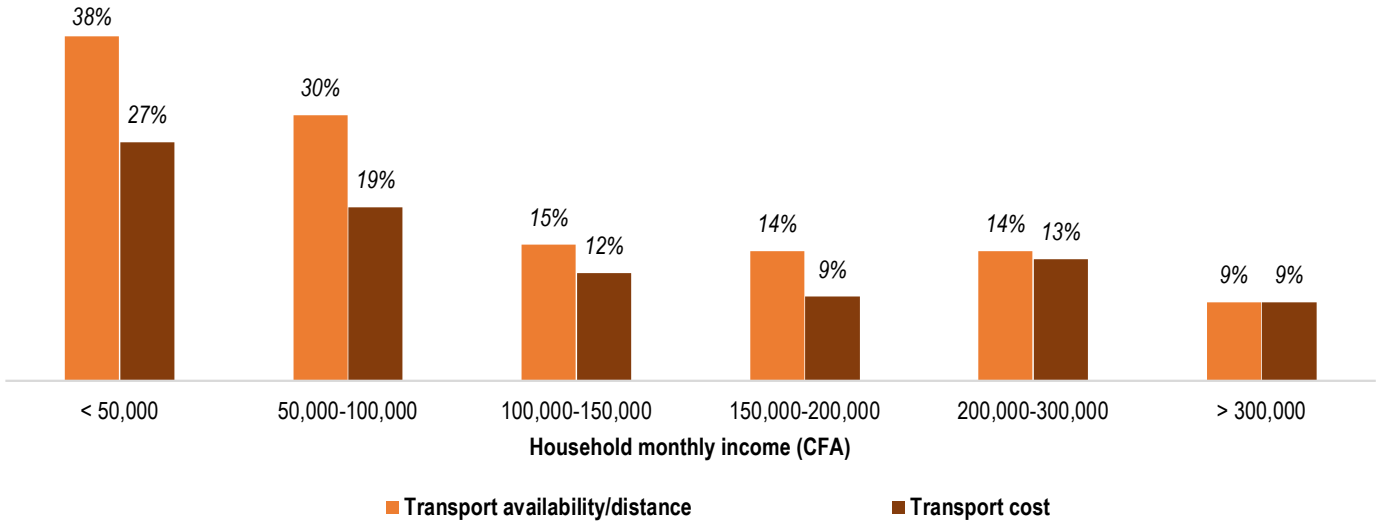
5.1.2. Transport costs as a barrier to accessing schools and healthcare facilities

According to the surveys conducted in Ouagadougou in June 2020, on average, the one-way cost of traveling to a medical facility was reported at about US$2.54; however, the average was as high as US$5.71 for those who had traveled by car but was only US$0.36 for the person who had traveled by bus. For travel to schools, the average one-way cost of transport was reported at about US$1.61, but ranged from zero monetary cost incurred by those who walked to US$17.81 for the person who traveled by car. Nearly all those respondents who on the day of the interview had traveled to a school by bus did not report a per-trip cost but said that their transport costs for travel to the school amount to about US$5.30 per month, quite a significant sum for many households.

In fact, compared to travel for medical needs, transport cost appears to be a more important constraint for children to attend school, *relative to other constraints*, and also somewhat more important than transport availability/distance, with 26% of the respondents saying it is either the most important constraint or one of the main ones. Female parents are more likely to report transport cost as an important constraint compared to male parents (30% vs. 22%) and also more likely to report it as a constraint compared to transport availability/ distance. The number of respondents in each household income bracket is relatively small, and a large share of those respondents who reported transport cost to be an important constraint either declined to report their household income or did not know it. Nevertheless, some differences can be observed across the household income spectrum, with the respondents in the lower-income groups much more likely than those in the upper-income ones to report transport cost as an important constraint for their children to attend to school.

For 16% of the respondents, transport cost is among the main constraints affecting access to healthcare, and it is equally so among women as among men. Transport cost is a more common constraint for the older respondents and, as expected, among the respondents belonging to lower-income households. Across all household income categories except the very upper one, however, transport availability/ distance represents a more important constraint than transport cost, while for the highest income household individuals both factors are reported as important by equal shares of respondents. Within the lowest-income group, both transport availability and cost in fact appear to be constraining for a larger share of men than women; in other words, a higher share of low-income women than men consider *other* constraints to be more important in their ability to access healthcare services.

Figure 3: Availability/distance of transportation vs. transport cost as "the most important constraint" or "one of the main constraints" in accessing health services, by household income in Ouagadougou (% of respondents)



Source: Survey in Ouagadougou by SATREC, 2020

Ugandans living in urban areas use 6.9% of total monthly expenditure on transportation; in Kampala, this figure is 7.9% (UBOS, 2018). Expenditure on transport to and from school in urban areas differs by the level of education: children in primary education pay 1.6 times more than children in secondary education.

According to the Kigali Master Plan of 2018, depending on the Kigali district, children spend between RWF 790 (Gasabo district) and RWF 1,285 (Kicukiro), on average, to travel to school, equivalent to US$0.81-1.31, although for some children the expense reaches RWF 6,500-7,000. However, these averages are in light of the overwhelming dependence of children on walking to get to and from school, with only a small share relying on public or private transport.

According to 2011 data, households in Zimbabwe's Urban Council Areas spend, on average, 9.6% of their budget on transport, although the share is slightly higher in Harare specifically, reaching 12.4% (ZIMSTAT, 2013). No breakdown, however, is available on the spending burdens faced by different population groups.

In Douala, about 15% of the city's residents perceive transport cost as the main constraint for travel; however, among the low-income residents the share is nearly 20% (Household Travel Survey, 2018).

Data from a 2015 survey in Dakar suggests that the average reported expenses for students to reach school range from US$0.25 among elementary school students to about US$0.31 among secondary school students. Thus, the overall daily expenses on transport amount to US$0.5-0.6 per student, which is high considering the average household budgets in the city and also considering the fact that the vast majority of students reach school by walking and therefore do not incur transport expenses at all (see Republique du Senegal, 2015).

5.2. Evidence from interviews with human rights practitioners

5.2.1. Transport and physical accessibility related barriers

To provide a richer perspective on the variety of constraints faced by specific marginalized groups in accessing needed care and schooling, the study team conducted a series of semi-structured interviews with key staff at international and locally-based human rights and development organizations working in the countries in scope of the study, including the OHCHR local and regional offices, the UN and UNFPA local offices, and FATE (based locally in Kigali).

As suggested by the interviews, in all countries, transport infrastructure and services appear as a critical barrier to accessing health services, and it is yet more intensified for women due to a combination of constraints related to gender norms, economic dependence, and transport availability. However, another reason for the marginalization of specific population groups is also the spatially varying quality of the healthcare services available. Similarly, even in areas where physical access appears to exist, some groups have limited access to health services in practice, such as due to limited affordability of the health service itself and the time costs associated with the long wait times to receive care. The COVID-19 crisis was noted by several to have impacted access to healthcare, especially affecting maternal health.

While not as much highlighted as in the case of healthcare access, transport gaps represent a barrier for schooling not only because public transport is reportedly not organized to reach schools but also because in some locations even the private transport services (taxis) are limited. The interviewed experts noted that access to education is generally better than access to health; however, it is still unequal due to various factors. More variation in access to public education was noted in comparison to health access, which was generally considered poor. Inequalities in education access were reported to result from inequality in physical access and transport gaps; inequality in quality (due to the issue of "dual systems", similarly to healthcare); affordability; and the exclusion of specific groups, such as children living in city peripheries and informal settlements, "street" children, and children with disabilities; and gender norms that prioritize boys' education over girls' and impose heavier household chore duties on women and girls. The COVID-19 pandemic was again noted as having had a magnifying impact on these already sizable constraints.

The poor

As noted by the human rights professionals working in Rwanda and Senegal, for example, only the middle class, the affluent, and foreigners can easily access quality health services, with the access gaps faced by the poor mostly attributed to the widespread job informality and income insecurity. A recurrent theme in the interviews is a divergence between legal provisions and practice: how health is supposed to be "universal", with many countries having legal provisions that establish that health (and primary education) are free; however, in practice, the poor populations cannot access care. Even in areas with where some healthcare physical facilities are present, health services or medicine may not be available, reliable, affordable, or of sufficient quality, especially for higher complexity treatment. Given these constraints, the poor in practice end up not accessing nearby health services but, instead, have to refer to private services that are costly and more distant. This same issue was pointed out in interviews across Burkina Faso, Senegal, Uganda, and Zimbabwe and, to some extent, is likely present in all countries.

"Maybe one other issue, that goes back to the issue of transport, is that reaching the health centers requires a cost, and [Name] correct me, but that has an impact on whether, when or not people access health services. And of course, there is a huge difference between the poor and the rest of the population."

— Uganda

"In terms of geographical location, for some people to go to the central hospital, it takes money and time, and that's another type of barrier. It can also be noted that in the capital Ouagadougou, public transportation doesn't really exist like that, and people use private transportation."

— Burkina Faso

"The middle class and the affluent, they can easily access the health services, but you will find the people who are living, even at 10 km radius from the city center, they are living in, the slum areas and poor high densities, their access to health service is completely compromised. Especially now with the COVID crisis, if you don't have your personal transport and you are relying on public transport, it means automatically you are cut off from major health service. [...] The other issue is also accessibility because, with the lockdown restrictions, many clients don't have letters to go and seek the services. Those are added transport costs because much of the public transport has been suspended. The few cars applying the rules they will be like overcharging because they are taking a risk, so the transport cost has also become very high in the country."

— Harare

Photo credits: Sarah Farhat

> **"No, it's not accessible to many of these, in Ethiopia, especially the street children, they don't have access to education, even if it is free, primary education is free, they don't have access to education because their parents can't afford, it's not school fees, it is about feeding, it is about transport to get to these schools."**
>
> — Ethiopia

In all countries, transport infrastructure and services appear as a critical barrier to accessing health services; however, the accessibility disadvantages for those population groups – such as the lower income ones – who are dependent on public transport to travel longer distances have been yet more magnified during the context of the COVID-19 pandemic. On the other hand, a positive example is Rwanda, which delivered some medicines (e.g., antiretroviral) to communities to ensure people would not physically move.

Affordability is reportedly a significant issue for accessing education for children from poorer families and families living in informal settlements. In many countries, even those such as Kenya, Rwanda, Uganda, and Zimbabwe where primary education is free "on paper", families reportedly pay sometimes considerable additional costs related to transport, food, and in terms of lost earnings. Due to affordability issues, children from poor households sometimes have to walk long distances to reach schools they can afford, as was noted in the case of Uganda. Many children drop out due to school fees in families with fewer resources, especially common among children living on the street.

Providing a complementary view, the World Bank's recent Joint Needs Assessment for Zimbabwe pointed out that while extreme poverty is associated with having limited access to quality social services, Zimbabwe's extremely poor in fact have net primary enrollment rates (different from attendance) nearly as high as the non-poor, with 87% and 92%, respectively. However, secondary education *enrollment* rates are low and the gap between poor and non-poor increases to more than 20 percentage points (34% for the extreme poor vs. 58% for the non-poor).

Women and girls

The transport infrastructure and services related barriers for accessing health services are intensified for women – especially older women, due to a combination of constraints related to gender norms, economic dependence, and transport availability.

Women and the youth were reported to be significantly affected by affordability constraints that are interrelated with cultural norms. As reported by the interviewed human rights experts in the countries in scope of the analysis, it is the households' men who usually own any private means of transport. For example, in Zimbabwe, women were said to depend on men to pay both for transportation and health services. In Uganda and Ethiopia, some women were reported to need their husbands' approval and depend on their husbands' willingness to pay to reach the hospital. Prenatal care, similarly, was suggested to depend to a certain extent on the husband's willingness to pay, while access to pre-natal and post-natal care specifically is reportedly limited in some cities due to a mix of constraints that include not only poor accessibility, but also direct and indirect costs, women's economic dependence, and cultural norms that generate a preference for traditional medicine and traditional birth attendants, among others (noted to be the case in Zimbabwe, Uganda, and Ethiopia). Access to maternal health is reported to be notably worse for women with disabilities and young girls; however, this is due to a host of reasons besides transportation, such as lack of appropriate beds and equipment at health facilities. However, also for elderly women the transport infrastructure and services related barriers for accessing health services were reported to be intensified (such as in Senegal), due to a combination of constraints related to gender norms, economic dependence, and transport availability.

"I am African myself but not most women have their own cars, it is the husbands in the household. even a bicycle, women, girls, not really, you rely on your husband to take you and if there is a health need that you do not need your husband to know because they are certain things you don't tell your husband, so having [breaking] reliability on public transport, it is quite not easy."

— Ethiopia

"I can give an example of when a woman conceives, she needs transport, she needs resources to buy other medicine, to go for antenatal but she has to ask her husband unless she is employed or she has a source of income, if she doesn't, then it becomes a problem, so she has to consult her husband, if her husband doesn't give money, of course, that affects the whole system, she will not access her maternal services, she will not go to the hospital, she will not take her child for immunization, and that becomes a problem."

—Uganda

"One of the things that we have picked up during monitoring from one of the monitoring communities, with the COVID period, was that there were single mothers who was HIV+ were largely employed in the informal sector doing washing and cleaning and people weren't getting them to clean anymore and therefore had no income and they had, for reason of stigma, registered to receive their Antiretroviral treatment not within the communities, further away from the communities and therefore with no income, they couldn't travel anymore to receive their treatment, and that was the issue and also because the prices of transport had gone up because public transport here is actually privately run; I mean public transport are run privately by groups and the prices hacked with COVID because of distancing measures."

— Kenya

Photo credits: Peter Kapuscinski

In individual countries, HIV positive women were reported to face stigma and therefore choose to register for treatment outside their communities – i.e., in facilities that are not necessarily nearest to their home and easiest to physically get to. Similarly to the earliest observation made in relation to the poor city residents, the accessibility challenges these women already face on a daily basis were further exacerbated by the COVID pandemic and the associated decline in public transport affordability.

At the same time, the interviewed experts highlighted the positive example of Rwanda which has utilized the pandemic period not only to improve the physical school infrastructure but also took advantage of the forced break in in-person schooling to train teachers with a focus on inclusive education.

Several of the interviewed experts highlighted sexual harassment and gender-based violence in public transport and while walking to or from school as key constraints for girls' education in particular (noted in the case of Burkina Faso, Kenya, Rwanda, Ethiopia, Zimbabwe, Uganda). Cases of harassment are reportedly common not only in public buses but also while waiting for transportation. Some experts pointed to transport design gaps as an enabler of harassment, for example, noting the poor lighting near bus stops and the need to walk long distances to reach a stop. The exposure of these types of risks is reportedly directly linked to affordability issues and, essentially, the great extent to which women and girls from certain income groups are entirely dependent on public transport, including poorly regulated informal paratransit (e.g., noted in the case of Kampala and Harare). As a result of these risks, parents reportedly refrain from sending their daughters to school due to fear of harassment or violence (noted in the case of Ethiopia and Kenya).

Other marginalized and vulnerable groups

Age is an element that contributes to discrimination in various ways. In Ethiopia, women past child-rearing age reportedly have limited access to health services. In Zimbabwe, the youth face challenges in accessing their desired health care due to a lack of financial independence. In Kenya, access to health by the elderly population in urban areas is reportedly restricted due to mobility constraints related to transport affordability and lack of social support.

Appropriateness of mobility systems for people with disabilities was noted as a barrier for accessing healthcare in several countries. For example, blind people in Uganda were noted not to be able to move independently because of the lack of appropriate transport; this, in turn, was noted to particularly exclude blind people with lower incomes who cannot afford a guide. However, in individual cases, such as Rwanda, the interviewed experts highlighted the existence of policies aimed to make health facilities suitable for people with disabilities. Similarly, children with disabilities are reported to not have adequate transportation to schools or school facilities in several countries, and while there are many special needs schools (such as in Rwanda and Zimbabwe), getting admission to them is not possible for everyone in need. Poor pedestrian infrastructure – which is the main infrastructure children rely on to reach schools across all the cities in scope of this study – reportedly limits walkability, disproportionately affecting children with disabilities, especially during peak hours, as noted in the case of Kampala and Nairobi. Moreover, children with disabilities are reportedly excluded from schooling also due to other factors besides inadequate transport access; these mostly include inadequate staff training and school infrastructure, as mentioned in the case of Kenya, Senegal, and Ethiopia.

In individual cities, Internally Displaced Persons represent another marginalized group in terms of access: as reported by the human rights experts, in Ethiopia, women in refugee camps face many challenges for accessing health services; similarly, in Burkina Faso, people who have been displaced and live in the capital do not have access to services due to lack of formal recognition and registration.

Certain population groups characterized by overlapping types of marginalization are reported to experience particular access difficulties. People with disabilities, women with disabilities, single mothers, people with albinism, LGBTI, and HIV positive women were all mentioned in the interviews as disadvantaged in their access to health. For these populations, poverty overlaps with other issues related to social norms, stigma, and economic dependence. The lack of preparedness of health systems in terms of adequate infrastructure and staff training also contributes to these groups' discrimination. Several examples of such issues were mentioned in interviews covering Uganda, Ethiopia, and Burkina Faso. Inadequate transport infrastructure was noted to represent a barrier for gender-based violence survivors to access care services.

> **"Another aspect that emerged as a barrier is because of the nature of the infrastructure as it has been put, it makes it very difficult when law enforcement agencies want to enforce containment, for example to allow safe passage of survivors if they want to go for health facilities."**
>
> — Kenya

5.2.2. Beyond transport: constraints to fulfilling the right to health and education due to social norms, cultural beliefs, lack of appropriate information provision

Health

Social norms limit women's access to information and health services related to contraception and reproductive healthcare and affect the appropriate service provision. Access to information on this health topic remains limited, and cultural barriers lead to some institutions that work on these issues to close. Many hospitals are attached to family planning clinics; however, because they have different entrances, and the person can be seen entering, so many are reluctant to do that (e.g., in Ethiopia). Cultural factors threaten prenatal care for girls specifically: many services are not "adolescent-friendly", especially in reproductive health (e.g., noted in the case of Zimbabwe).

Lack of childcare options was reported to be another barrier for women to access medical treatment. Because of the household organization and cultural factors, women need to address the logistics and the extra costs when she or one of their children is in the hospital.

In several countries, a common additional barrier to accessing healthcare services relates to the inappropriate formats in which health information is provided – be it limited to the main spoken language in the specific country (e.g., mentioned in the case of Kenya and Ethiopia) or the lack of appropriate communication formats for people with disabilities such as hearing impairment (e.g., in Kenya, Zimbabwe) or the youth. Social norms and taboos limit access to reproductive health information to LGBTI groups and women in several countries.

The ability of people to rely on the service actually being available is another issue affecting the real accessibility to care. For example, in the case of Zimbabwe, the interviewed human rights experts noted that, even if accessibility challenges are overcome, people may find the service unavailable due to other factors impacting provision, such as strikes. In Burkina Faso, where the situation differs from most of the other countries covered in this study due to high levels of fragility, armed conflict, especially in combination with the COVID-19 pandemic, impedes with people's ability to fulfill their right to health, although reportedly more so in the Northern region than in Ouagadougou.

> **"I think the most important thing, in the case of Burkina is that the existing challenges that are really high, are being accelerated by first, armed conflict rising and in the second place COVID-19, which is affecting people's access, like movement of people etc. that has been limiting the rights, in particular economic and social rights."**
>
> **— Burkina Faso**

Affordability is a universal and significant issue in accessing health. First, there is limited affordability of healthcare services and medicine. Even in locations where there is some type of public health insurance, the coverage can be limited, or the payments required are still high for poor groups, as was noted in the case of Zimbabwe and Rwanda. Second, the bureaucracy (e.g., verifying insurance information) and waiting times to access health are associated with overall high time costs.

Education

The ability of girls to fulfill their right to education – especially at the higher levels – was noted by several of the interviewed human rights experts to be inevitably hindered by gender norms and cultural practices, most notably early marriage and pregnancy (noted in the case of Rwanda, Kenya, Ethiopia, Zimbabwe). In several countries, household organization was reported to affect girls' education, especially when they are teenagers. They have to help in doing household chores, which impacts day scholars, as they have to balance school work and chores at home.

These norms and their impact on education have reportedly intensified during the COVID-19 epidemic, further widening learning inequalities. Many countries established distance learning in response to the pandemic, which has disproportionately negatively affected children from households that do not own a computer and internet access (noted in Zimbabwe, Rwanda) or radio that can be used for radio classes (in Burkina Faso). The homeschooling based approach that was adopted during the pandemic reportedly further worsened girls' ability to learn specifically: staying at home has, instead, been associated with increased care burden and, in some cases, worsened the issue of early marriage and pregnancy.

There were no examples mentioned in the interviews of civil society participation in the planning of where new schools should be built to better serve the communities better. The interviews noted the overall presence of participation mechanisms for parents in private schools but not in public ones (e.g., in Ethiopia), and the lack of adequate communication and access to information, which hinders public participation, despite formal laws

prescribing mechanisms of public participation in education (e.g., in Kenya). On the other hand, informants also highlighted positive examples, such as the ability of parent committees in Rwanda to decide on the costs associated with education in both public and private schools, and the involvement of parents in school management in Uganda – including the decisions regarding new roads (not in Kampala).

> **"The other one is social norms, I believe it is not only tied to Kenya but world-wide where it is expected that girls and women take the large burden of domestic household chores and you find out that it affects their ability to give devoted time to their education and this has been magnified during COVID period, for those that are being home schooled, you find that they have to attend to house chores before they attend to the studies. This will attend to be a challenge especially now as we are talking about home-based care approach to COVID and women and girls will be burdened with that and that will affect their access to education."**
>
> — Kenya

Photo credits: Flore de Preneuf

6. Barriers to Health and Education Accessibility: The Spatial Lens

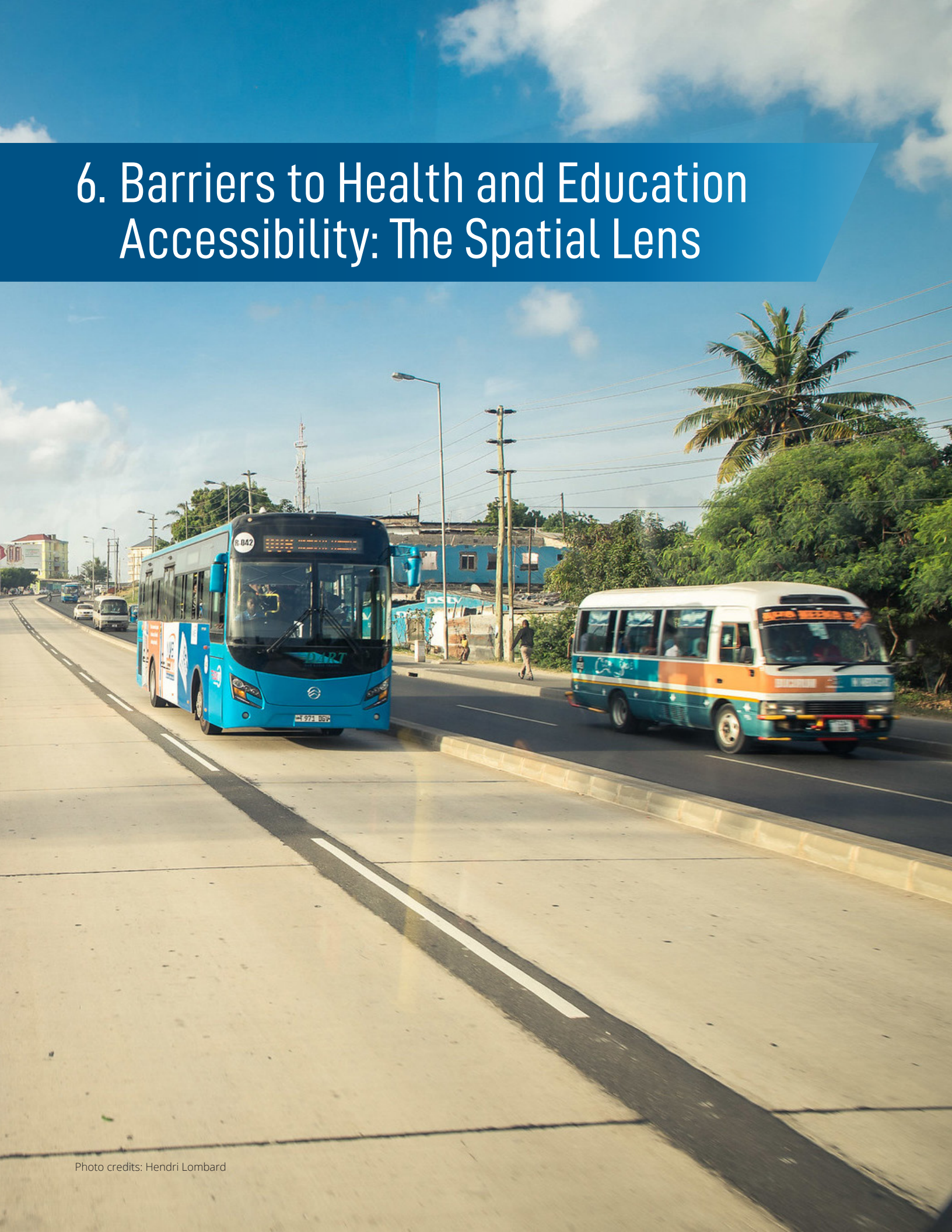


Photo credits: Hendri Lombard

6.1. The spatial reach of the public transport systems

Providing a complementary perspective on the constraints to accessing health and education opportunities in the ten cities, the following sections assess – through a spatial lens – the current state of public transport based *physical* accessibility to schools and health facilities as a necessary, if not sufficient, condition for the rights to education and health to be realized.

The public transport data is based on available GTFS data, the standard data used for planning routes, or Geographic Information System shapefiles with the information on public transportation travel speeds and frequencies. GTFS data of both formal and informal public transport services produced by private companies and national agencies, sometimes with World Bank assistance, were available for all cities except Ouagadougou, Kigali, and Conakry; for the latter cities GTFS was generated from the available transport network shapefiles, integrating speed and headway information. In most of the cities, public transport services are ensured entirely by bus transport, and in many cases these are paratransit operators driving minibuses that crisscross the urbanized area, providing varying degrees of spatial coverage of the more densely populated areas. The public transport network data is combined with data from Open Street Maps (OSM) on the road networks in each city.

The ten cities would be difficult to compare if based on their formal administrative boundaries, which in some cases capture the true "functional city" better than in others. To have a comparable frame of analysis between metropolitan areas, the study defines a uniform boundary for the metropolitan area in the case of each city, including within it all areas from which at least some jobs in the formal city can be accessed within an hour of travel. Thus, peri-urban areas are counted as part of the "functional city" based only on access to employment opportunities identified within the urban area, and not in outlying areas themselves. Data on job locations used to define the boundaries in the case of each city was sometimes available directly, such as in the case of Kigali, Bamako, and Dar es Salaam, and in the case of others an extrapolation of job locations was created by generating a relative index of "job-likeliness" throughout each metropolitan area by identifying Employment Opportunity Areas of different intensity. These were determined by scoring different indicators on 500-meter cells in a grid covering each city, with scores including the count of employment-related amenities – number of retail and financial establishments, proximity to major intersections, etc. – extracted from Google Maps and OSM, within each cell and its adjacent cells. This methodology for defining metropolitan boundaries was initially proposed by Peralta-Quiros *et al*. (2019).

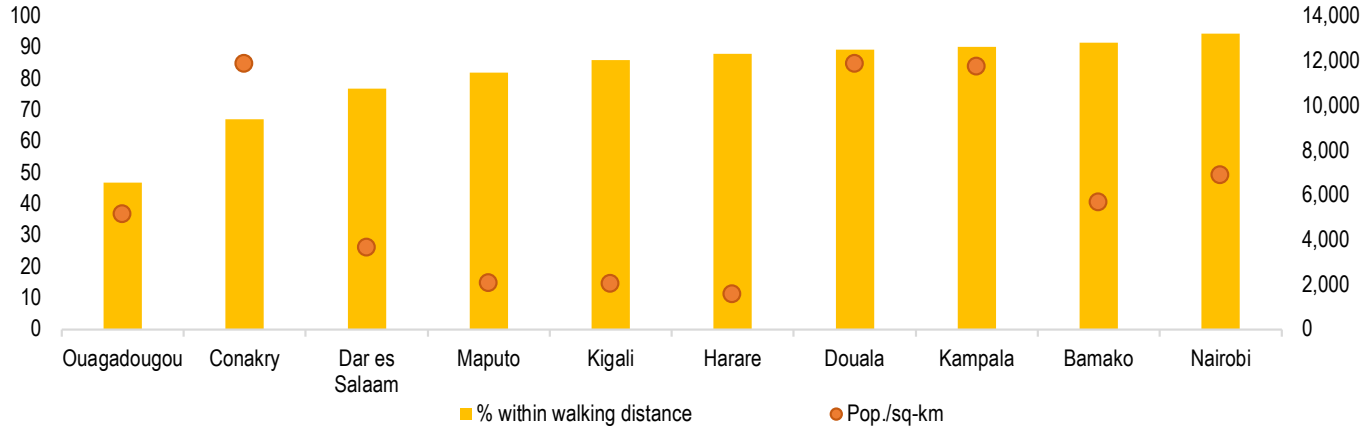
The uniform approach to defining city boundaries based on how they truly function allows for a fairer and more direct comparison of the spatial indicators of accessibility among them. An exception here is Kampala, for which the methodology could not be consistently applied due to more limited availability (only covering the formal city limits) of geo-located health facility data. Kampala's spatial planning and accessibility metrics presented later in the paper are therefore not directly comparable to the other cities, and are likely somewhat inflated compared to what they would be if the true – much wider – definition of the "functional city" were applied.

The average population densities of the cities, based on this consistent definition of boundaries, ranges from only about 1,500-2,000 people per square-kilometer in Harare, Maputo, and Kigali, to 3,500-7,000 in Dar es Salaam, Bamako, Nairobi, and Ouagadougou; in Douala, Conakry, and Kampala (the latter defined by the official city boundary) population densities exceed 8,000 per km^2.

Using the "functional city" boundary and the spatial coverage of the public transport networks, we calculate the share of the population that live in direct vicinity of public transport, as measured by a 1-km radius (representing "walking distance"). This indicator provides an insight on the extent to which each city's development has been transit-oriented – i.e., whether or not higher residential densities are concentrated near transit (or whether public transport networks have expanded to serve newly emerged residential poles. However, high density per land area of the public transport networks themselves can to some extent compensate for development that is characterized by more uniform and less articulated residential densities.

In the ten cities covered in this study, most have upward of 85% of the population living within direct proximity of a public transport route, reaching nearly 95% in Nairobi. Dar es Salaam and Maputo have somewhat lower shares of people living within walking distance of transit, despite relatively well developed public transport networks. Finally, Conakry and, especially, Ouagadougou, stand out as having a large share of their populations – in the case of Ouagadougou, more than a half – living further away from the transit network, which is largely explained by the sparsity of the networks themselves, as described later. Across the ten cities, the relationship between average population density and the share of population concentrated near the transit networks is not very distinct. In Douala and Kampala, high density is combined with high shares of population living near transit; in Harare, Kigali, and Maputo, despite much lower average densities, the public transport networks are nevertheless directly accessible to a large share of the city residents. In Conakry, despite a very high population density and compact city form, the sparsity of the existing public transport network means that a low share of people have a convenient access to it. In Ouagadougou, relatively low average population densities combined with a low-density public bus network result in a very low share of the city's population able to reach a bus line within a kilometer walk. Finally, Bamako and Nairobi stand out as having perhaps the most strategically articulated population densities and/or public transport networks that have effectively adapted to evolving population growth in certain localities: despite moderate average population densities, these cities have the highest share of their populations within direct walking distance of public transport.

Figure 4: Population within walkable distance (1 km) of public transport (%) and average population density (pop./km2)



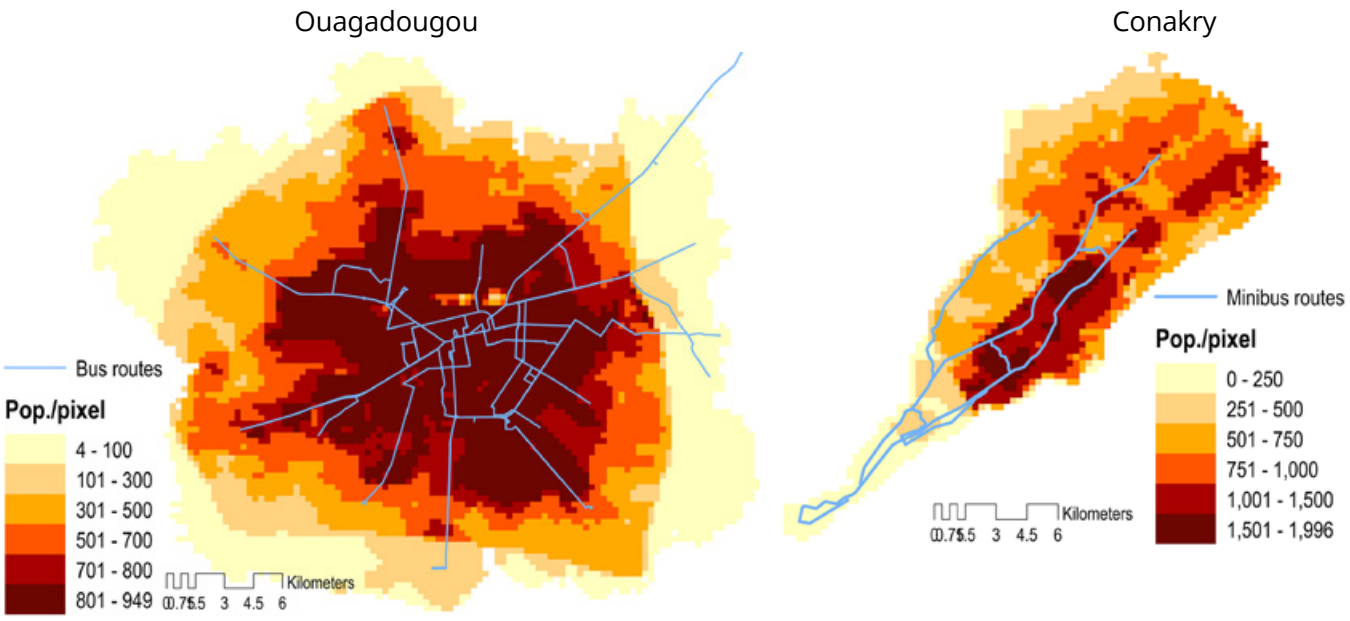
Source: Estimates by study team

In **Ouagadougou**, bus transport services are provided by SOTRACO (*Société de Transport en Commun de Ouagadougou*) and, unlike in most other African cities, there are no formal or informal public minibus services. Bus ridership represents less than 1% of all trips, which can be explained by the sparsity of the bus network, with only about 30 lines operating at a frequency of one bus every 20 or 30 minutes (every two hours on individual routes). Moreover, the buses are overloaded and unreliable (Commune of Ouagadougou, 2019).

Mobility challenges in **Conakry** are at least partly due to the geographical position and structure of the city, such as the city center being located in a peninsula. The public transport system in this city is very sparse, consisting of only about ten routes, although these are concentrated in the most densely populated areas. Public transport, mostly provided by informal operators, does not efficiency serve mobility needs. Among public transport modes, the *magbanas* (informal minibuses) are regarded as the more affordable, but the perception of service depends on whether the user is in an accessible area. The poorly distributed service, the need to walk to the stop, and the risk of getting trapped in congestion implies that people using this mode have to allow for a lot of time to reach their destination (SSATP, 2004b). If also including moto-taxis, public transport is estimated to represent 40% of all trips in Conakry (Republique de Guinee, 2019a).

Douala's public bus network operated by SOCATUR (*Société Camerounaise des Transports Urbains*) consists of a network of 30 lines, of which only 8 are in operation. Although not very expensive, the buses currently serve only about 1% of the trips made in the city. The bus services are made unattractive by long waiting times, irregular traffic headways that are difficult for users to understand, uncomfortable buses, congestion, competition from moto taxis, and poor road infrastructure. In addition to the formal network, the informal Yellow

Figure 5: Examples of cities with public transport systems with relatively low coverage of populated areas



taxis run on organized routes during rush hours and capture about 19% of motorized trips. Moto taxis are still the most common mode of transports, accounting for 61% of all motorized trips. However, given that moto taxis are a mode of transport that is widely regarded as unsafe and expensive, and that they do not travel on identified routes, we have chosen to not include them in the accessibility study. Waiting time for the Yellow taxis are typically due to limited capacity compared to the demand (queues at transfer points for entering a taxi), but reliable data on these could not be obtained. Despite the limitations, the public transport system in Douala appears to do relatively well in terms of its direct access to the city's population.

A recent study suggests that the physical form of **Bamako** is one of the factors that increase congestion, given that most of the administration, higher education buildings, and the main market are in Rive Gauche (near city center) (World Bank, 2019b). It notes that accessibility in Bamako is limited by the poor quality of connective infrastructure, poor coverage of public transport, and a fragmented city, which makes it difficult and expensive to provide social services.

As in many of the cities, the public transport system in **Bamako** is entirely dominated by minibus transport (Société des Transports du Mali, SOTRAMA), consisting of about 200 routes. The system provides a relatively good coverage of the city's more populated areas. Approximately 92% of the residents of the "functional city" – which approximately corresponds to the extent of the official Bamako Circle administrative boundary – live within walking distance to at least one minibus route.

In **Dar es Salaam**, the public transport system consists mostly of informal minibuses – or *daladalas* – that ensure quite a dense network across the city, as well as the relatively new Dar es Salaam Bus Rapid Transit system that so far serves only one corridor but is planned to be expanded six-fold.

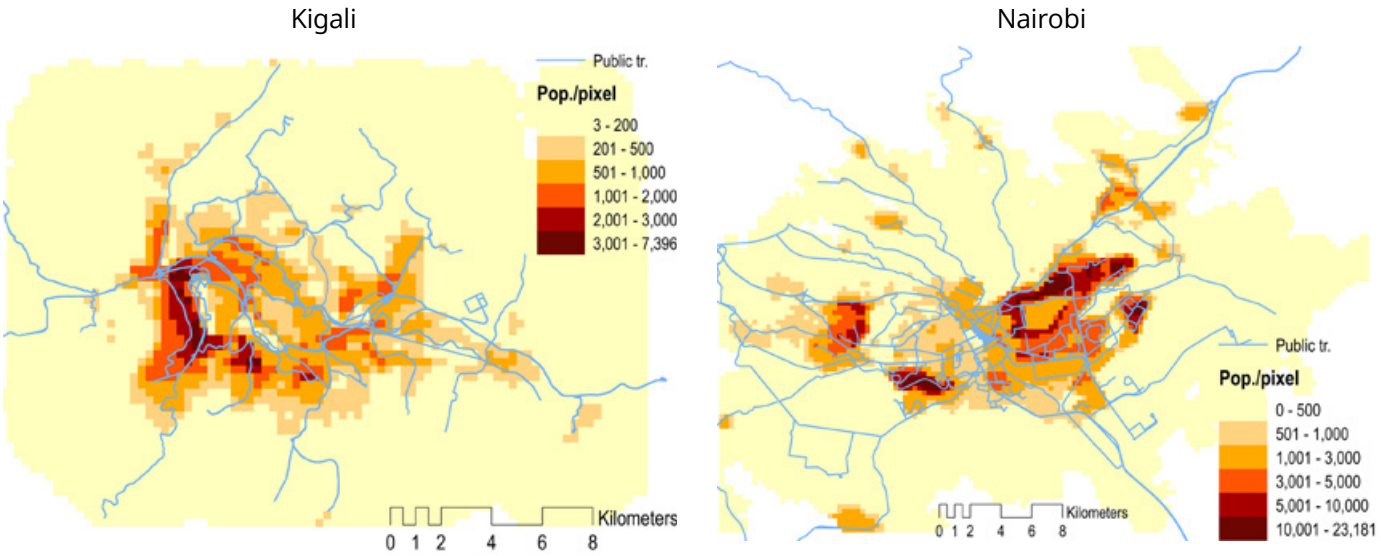
Kigali's public transport services are ensured by bus transport, which operates on approximately 250 routes and is relatively well distributed across the "functional city" of Kigali. However, this is much less so the case of the extent of the formal Kigali City, which extends significantly beyond the area considered in the current analysis – the only city in the group for which this is the case.

In **Harare**, public transport services, similarly to most cities in scope, are predominantly provided by paratransit operators. The network is extensive and covers the high-population-density areas relatively well, with approximately 88% of the city's residents living within walking distance of the public transport network.

Kampala's public transport system, consisting primarily of informal minibus – or *boda boda* – routes, covers the populated areas well. Considering the full extent of the functional city, about 90% of Kampala's residents are within 1 km of public transport, and this share increases to nearly 98% if only considering the residents of the Kampala administrative area proper.

Maputo's public transport system consists of approximately 240 bus, minibus, and rail lines that cover the city's most densely populated areas well but are much more sparse in the more peripheral areas of the "functional city."

Figure 6: Examples of cities with public transport systems with relatively good coverage of densely populated areas



Nairobi's public transport system is predominantly informal, consisting of six rail lines and just over 120 *matatu* – or informal minibus – routes, the latter of which effectively cover the city's high-density areas.

Nearly 95% of the residents of the "functional city" of Nairobi, whose boundaries also quite closely correspond to those of the administratively defined "Nairobi county", live within walking distance of the public transport network.

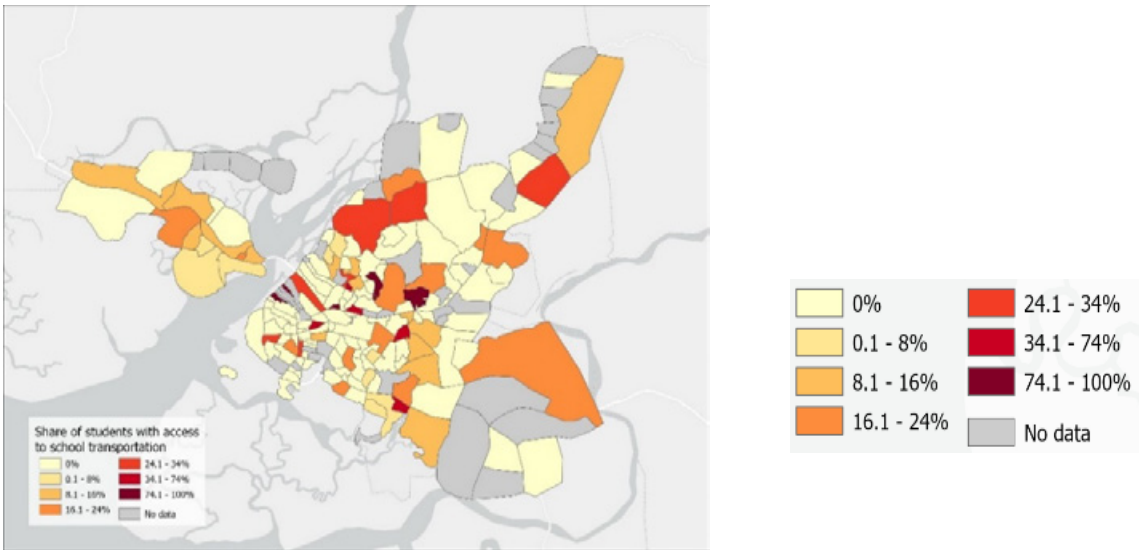
Despite the city appearing quite transit-oriented based on the spatial residential patterns, most of Nairobi's slum residents cannot afford any of the motorized transport options in the city, and Nairobi also performs poorly in the provision of NMT infrastructure; as a result, children and women are disproportionately affected in terms of social inclusion and sustainable mobility (Salon & Gulyani, 2019). A survey conducted along two corridors in Nairobi point out that the main reasons to use NMT is affordability and speed, while the reasons against it are the lack of NMT infrastructure and safety concerns (see Mitullah *et al*., 2013). Another challenge, common in many developing cities, is that the roads and spaces intended for NMT are taken up by kiosks. Finally, pollution, dust, and the presence of sewerage on walkways all make NMT more difficult.

6.2. Availability of dedicated transport to schools and health facilities

Data on access to dedicated transport to schools is available for only some of the cities in scope. In Douala, the recent household travel survey indicates that the availability of school transportation is very limited. Only 2% of students report having access to free dedicated school transport; another 2% have access to school transport that is partly paid for the educational establishment. For 4% of the students, dedicated school transport is available but is entirely their own financial responsibility. There is no clear pattern in the availability of dedicated school transportation across the city: in individual centrally located neighborhoods access is nearly universal, but these border with neighborhoods with no access at all. It is possible that there are some issues with the representativeness of the data at the zone level.

In Kampala, the database available from the KCCA – which only covers the administrative area of Kampala proper – information is provided for each medical facility on the availability of ambulance services. Among all 420 medical facilities in the city that provide any surgical services, 61 are reported to provide an ambulance service. Among the 26 hospitals specifically, ambulance services are available for 23 (including for all of the public ones).

Figure 7: Access to dedicated school transportation in Douala (% of students)



Source: Douala Household Travel Survey 2018

Only a small share of the privately operated advanced health facilities in Conakry – which represent the large majority of all advanced healthcare facilities – have their own dedicated transport services that can be used to transport the patients in from around the city. Of the 89 clinics, 10 have an ambulance service available, while among the 27 polyclinics, eight do (see Abt Associates Inc., 2018).

Evidence from other cities in SSA for which household travel survey data is available also suggest that transport organized/provided by schools themselves to ensure the daily travel needs of students is not commonly available. In Dakar, school bus is used by just 1% of all elementary school students and about 2.5% of secondary school students. Among all students under the age of 18, a lightly higher share of girls than boys report relying on school pick-up, with 3% versus 2%, respectively (see Republique du Senegal, 2015). In Abidjan, only a fraction of a percent of either primary or secondary school students report using school bus to travel to school (see Republic of Cote d'Ivoire, 2013).

Photo credits: Sarah Farhat

6.3. Distribution of education and healthcare facilities within the cities

In the interviews with human rights organizations working in the countries in scope of this study, inadequate access to healthcare services and education was noted, among others, to be a function of insufficient accountability and inter-sectoral coordination. The interviewed experts noted that users' needs are not always taken into account in the siting of health and education facilities vis-à-vis the road and the public transport network, indicative of a lack of consultation with the population and representatives of the education and health sectors.

> **"Our transport sector has sort been ad-hoc, because in the early times, early 70s, it was only being manage by the government, therefore it was easy for them to be managed, the routes; but by the time it was privatized like [R2] has said, then therefore you find it is driven by the demand in the market and not necessarily the need that's there. So it is not uncommon to find a health facility that is adequate, a private one most of the time, it is not at approximate place next to the road and this is an indication that there was little consultation even with the people in the health sector and also the education sector. So it is something that has been organic but not necessarily practically run. There is exact recognition that there is need to reform that to ensure that the facilities are planned according to the infrastructure and with participation of the public."**
>
> — Kenya

The analysis presented in this section provides a spatial-quantitative perspective to complement the interviews, providing insights on the spatial distribution of health and education facilities in each city, the extent to which their planning appears to have been coordinated with transport networks, and the degree to which land use in each city is mixed in the sense of having essential health and education facilities present locally within residential communities.

Basic health and education facility data for nearly any city in the world is available from OSM; however, this data is crowd-sourced and not always verified by institutions working in the health and education sectors on the ground. In this analysis, only those cities were included where officially verified geo-locations of health and/or education facilities were available, most of them provided by the World Bank staff in Health and Education sectors working directly with the relevant country- and city-level institutions. For a few cities, the facilities were geo-mapped using available official lists of facilities provided by the relevant institutions on the ground. In several cities, only health facility geo-locations could be obtained.

Ouagadougou: Spatial locations of health facilities and schools were made available to the study team by the government Ministries, including information on the facilities' public versus private status and care or schooling level offered; these were mapped on the ground in February-March of 2020. The facilities are distinguished by their role in the education or health sector hierarchy, respectively, such as primary schools versus secondary schools (separately, public and private), and community health and social centers (CSPS) and medical centers providing only some services (*centres medicaux*, or CM/CMU) versus medical centers with surgical capabilities (CMA) and hospitals providing highest available quality care in Burkina Faso. Only the latter two types – CMA and hospitals – are categorized as "advanced healthcare facilities" in the current study.

Douala: Data on the distribution of health and education facilities was provided by the Douala City Council, based on a detailed census of establishments carried out in 2017. Among health facilities, only those that provide core services are considered (for example, a health center that specializes in ophthalmology only would be excluded). A total of 11 hospitals and 145 clinics are mapped across the city, with private institutions outnumbering public ones by more than 10 to 1. Hospitals and clinics ("advanced healthcare facilities" providing surgical services, among which all hospitals are public and all clinics – private) are concentrated in the central parts of Douala, with much less facilities in the outlying areas. The education facilities included in the dataset are high-schools, middle-schools, and elementary schools. Private education is predominant in Douala.

Conakry: School location data is available from the Ministry of Education's Office for Strategy and Development, which also reports their public versus private status both for primary schools and secondary schools. The vast majority (about 90%) of both primary schools in the city are private. While the schools appear to be well distributed across the city, there are vast differences across the schools in terms of the student-to-teacher ratios, which the Ministry's dataset allows to calculate. For primary schools, these range from less than 3 students per teacher to as many as 188, with the public primary schools generally having higher ratios compared to the private ones. For secondary schools, the ratios range from about 1 teacher per student to about 115; individual private schools have higher ratios compared to any public ones.

A map of the public health facilities in Conakry is available from the Ministry of Health; the geo-locations and characteristics of private health facilities were collected as part of a recent mapping activity (details available in Abt Associated Inc, 2018). Among the private health facilities, the analysis considers only polyclinics and clinics, as these have hospital-like features like ambulance services, laboratories, and inpatient treatment opportunities, etc. Most polyclinics also ensure maternity services and have specialized delivery rooms, although only about half of all clinics do. Among public facilities, only medical centers and hospitals are included, while basic health centers are not. Altogether, 140 advanced healthcare facilities are geo-located, the vast majority of them privately operated. While the distribution of facilities is relatively even across the city, this is not the case for the few publicly operated ones, which are concentrated entirely in the southern and central part of Conakry.

Both health and education facilities in Conakry have in past studies been estimated to be more accessible in denser and wealthier areas closer to the city center: because the road network in the city improves accessibility in a linear way, people living closer to a radial road to city center experience an easier access. However, most roads are in poor condition, and, for those living outside the city center, the likelihood of living close to a paved road decreases by half (World Bank Group, 2019).

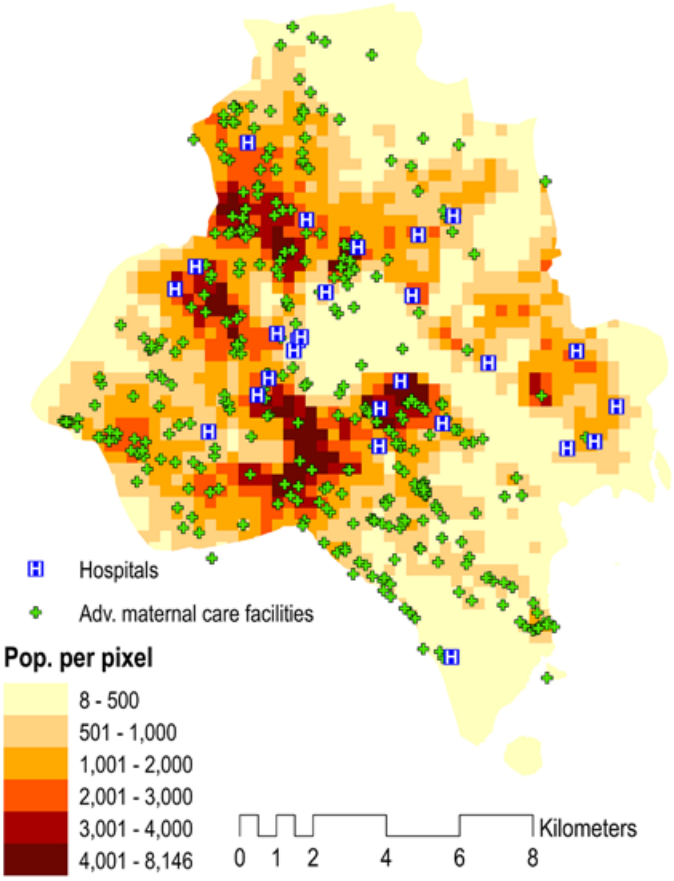
Bamako: In Mali, the Referral Health Centers (CSREF for short) are present in each District and in some cases have quite advanced facilities. Their role is to act as a link between the Community Health Centers (CSCOM) and the Hospitals. Most CSCOM are run by a Community Health Association. They provide basic preventative and curative services in maternal and child health. In the current analysis, CREF and hospitals are grouped together as "advanced healthcare facilities" (15). Education facilities are mapped based on a dataset assembled by the World Bank as part of the Mali Urbanization Review.

Dar es Salaam: Health facilities with coordinates are available from the Ministry of Health's Facility Registry. The facilities included in the analysis are limited to the health centers and hospitals, representing the subset of facilities providing advanced care, while excluding highly specialized facilities such as those dedicated to cancer or orthopedic treatment. We only consider health facilities that are "operating" rather than marked as "pending, under construction." Verified school facility geo-data was not available.

Kigali: Health facilities and schools, by type, were geo-located as part of a data mapping exercise managed by ESRI, a global Geospatial Information System company, commissioned by the Ministry of Infrastructure in 2019. Within the "functional city" of Kigali, 109 primary schools and 111 secondary schools were geo-located.

Rwanda's healthcare system operates a range of different facility types, among which health posts provide mainly outpatient services such as immunizations; similarly, clinics are equipped only with basic medical equipment. In Kigali, district and referral hospitals provide more advanced care, including caesarean surgeries, treatment of complicated cases, etc., and provide care to patients referred by the primary health centers, while health centers and medical clinics offer complete and integrated services such as curative, preventive, promotional, and rehabilitation services (WHO, 2017). Based on this characterization of the care offered, all hospitals and health centers/medical clinics are categorized as "advanced healthcare facilities" in the current study, although this may be overstating the level of care available at some specific health centers and medical clinics. Altogether, four district hospitals, four referral hospitals, 28 health centers, and 48 medical clinics are located within the "functional city" of Kigali.

Figure 8: Hospitals and other advanced health facilities providing maternal care in Kampala



Source: Data from KCCA database

Kampala: The KCCA provides detailed data on both public health facilities and for-profit health facilities for the Kampala city administrative area, along with information on the available staff and services. For the analysis, medical facilities that are reported to provide surgical services – i.e., "advanced" health facilities – were sub-selected (420 in total), of which 26 are hospitals and the rest are clinics and medical centers. Of the 420 facilities, the vast majority are private for-profit; the public/non-profit facilities tend to be somewhat more

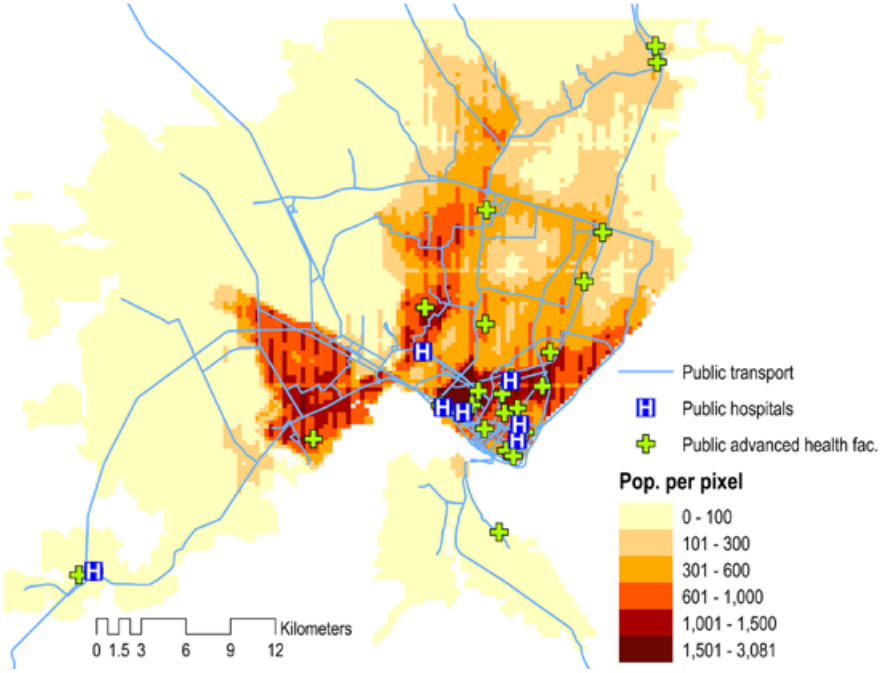
concentrated in the central city. Among the 26 hospitals, 15 are owned by private for-profit entities. Among the 420 facilities, 398 provide laboratory services, 146 provide radiology services, and 360 provide maternal care. Of the maternal care facilities, less than 10%, are government/non-profit owned. Because the dataset does not cover the full area that would be considered to be the "functional city" as per our methodology, accessibility metrics are estimated only for the administrative unit called "Kampala", which is considerably smaller. Within this area, advanced health facilities, and especially hospitals, are lacking in large parts of the more peripheral neighborhoods, especially in the city's North, extreme South, and Southeast, where population densities are lower. These areas also have a much lower density of advanced facilities that provide maternal care services, which are particularly important for women.

Harare: The list of health facilities for Harare was obtained from the Ministry of Health and Child Care; this dataset also provides information on the spatial coordinates of the public facilities. Based on the dataset, a total of 51 health facilities were located in Harare; these include clinics, policlinics, health centers, and hospitals. In addition to the list above, the Parirenyatwa Hospital was located using Google Earth. In the analysis, only hospitals and policlinics were retained, as these provide more advanced healthcare services. For education facilities, using a preliminary list, 159 primary schools and 177 secondary schools could be mapped in the city using Google Earth and OSM.

Maputo: Health facility and primary school geo-locations were identified based on datasets available from the Maputo municipality, the Department of Education, the Maputo Department of Urban Planning, and the Department of Health. Not all primary schools listed could be geo-located using the provided coordinates even after a thorough search, by school name, on Open Street Maps and Google Earth; therefore, the results should be interpreted with some caution. Altogether 230 public and private primary schools were located within the "functional city" of Maputo, which extends quite significantly to the West and South-West compared to the official boundaries of the Maputo province and the Maputo City localities. While central Maputo localities have a high density of primary schools, this is not the case in the more outlying localities like Cidade de Matola, Matola Rio, and Maputo 1.

The Mozambican healthcare classification distinguishes between primary healthcare and secondary healthcare, the latter including medical services related to obstetric care, surgery and the fight against AIDS. A comprehensive geo-location exercise in the public health sector was undertaken in 2013, when each type of facility was also characterized in terms of the available resources and services offered (see Cidade de Maputo, 2013). The health facility network of the City of Maputo is described in terms of the basic typology consisting of special hospitals, general hospitals, urban health centers (type A, B or C) and rural health centers (type I and II); however, this classification is of nominal character and does not necessarily respond to the services actually offered by each facility. The concept of the "Health Center" ranges from only emergency consultations carried out by a basic nurse or medical agent in a rural health center at his/her residence to a specialized gynecology consultation carried out by a gynecologist in a type A urban health center (Cidade de Maputo, 2013).

Figure 9: Advanced healthcare facilities and public transport network in Maputo

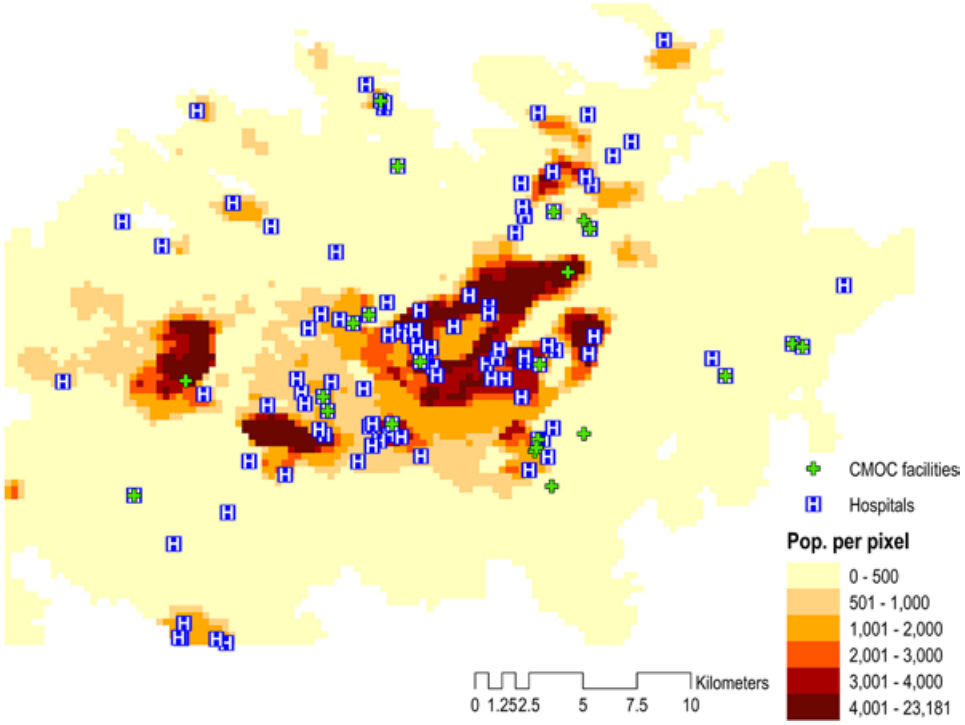


In the analysis, type A Urban Health Centers, type I Rural Health Centers, and Hospitals are defined as "advanced healthcare facilities" (altogether 32), with subsequent analysis of only the 7 hospitals (essentially the only facilities offering comprehensive surgical, laboratory, and inpatient care). As with primary schools, the presence of such advanced healthcare facilities, especially hospitals, is sparse in the less central localities of Maputo. The health network of the City of Maputo also comprises private healthcare facilities – those that are not managed by the Maputo City Health Directorate or by Maputo City Council, which are particularly important in the provision of the more specialized health services (e.g., psychiatric care); however, the current analysis does not include these various private facilities due to lack of data.

Nairobi: The list of healthcare facilities in the city is available from the Kenyan Ministry of Health.[90] As "advanced healthcare facilities" are grouped those facilities that are reported to have a clinical officer and some surgical capabilities (health centers, medical centers, and hospitals). Among these, we exclude highly specialized facilities – rehab centers, eye clinics, dental clinics, and AIDS clinics. Separate analysis is conducted for "public" health facilities (operated by faith-based organizations or the MoH) and for those facilities that are reported to provide Comprehensive Obstetric Care (CMOC). All facilities were geo-located manually, using Google Earth, based on their official name and Ward information, as exact coordinates were not available. Within the "functional city" of Nairobi, 301 advanced healthcare facilities were located, of which 115 are public; 111 of the 301 facilities are hospitals (Level 4-6

90 http://kmhfl.health.go.ke/#/home

Figure 10: Hospitals and health facilities providing comprehensive obstetric care in Nairobi



Source: Data from Ministry of Health of Kenya

in the Kenyan healthcare classification system), of which 19 are identified as public. A total of 24 facilities providing CMOC are located, of which 8 are public.

Geo-located data on primary and secondary schools was obtained from a dataset prepared by the Ministry of Education and Red Cross, posted on the Humanitarian Data Exchange website. The public versus private status of the schools in the database is only partially available. The Ministry of Education is currently working with UNICEF and USAID on a school mapping update; however, the data is not yet available. Altogether, 1,385 primary schools and 356 secondary schools were geo-located within the "functional city" of Nairobi.

The geo-locations of facilities, in combination with transport network and population data, provide additional insights on transport planning and transport-land use integration in the ten cities that can ultimately help explain differing accessibility patterns. **The first of these is the extent to which education and health facilities are directly accessible from the public transport networks**, as measured by the walking distance (1 km) metric. This is indicative of the extent to which these facilities have been cited in locations served by transit and/or the degree of overall coordination of transport and land use planning. With respect to primary and secondary schools, Harare and Bamako stand out as having the highest share of share of all facilities located within direct walking distance of public

transport – all schools in Bamako and 98-99% of them in Harare. The share of facilities near transit is also high in Maputo and Nairobi and, especially among secondary schools, Kigali. In comparison, in Conakry and Douala, at least a fifth of all secondary schools are not directly accessible from transit, and for primary schools the share is closer to one-quarter. Lastly, in Ouagadougou, nearly half of all schools, especially at the primary school level, are not directly accessible from any bus line. While the public transport network of Conakry is arguably sparser than Ouagadougou's, it appears that the siting of the school facilities in Conakry is more coordinated with the (limited) transit system than it is in Ouagadougou.

For the few cities where the breakdown of public vs. private schools is reliably available, it appears that public secondary schools, for example, are better accessible from transit compared to private ones, with 86% of Douala's public secondary schools, 84% of Conakry's, and 68% of Ouagadougou's located within walking distance from a public transport route.

Figure 11: Share of schools within walkable distance (1 km) from public transport (%)

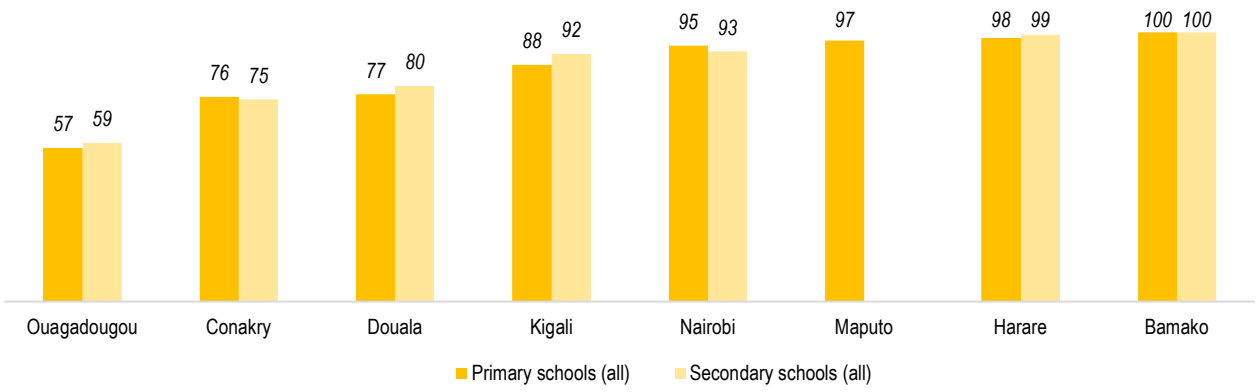
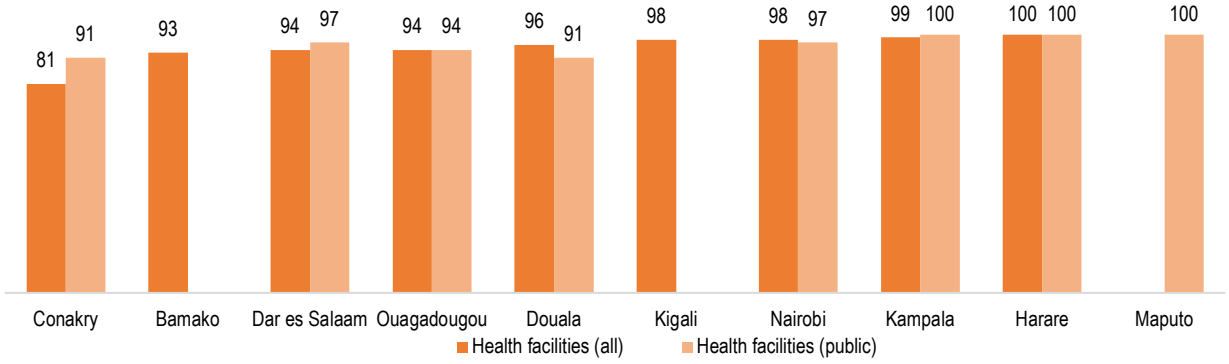


Figure 12: Share of advanced healthcare facilities within walkable distance (1 km) from public transport (%)



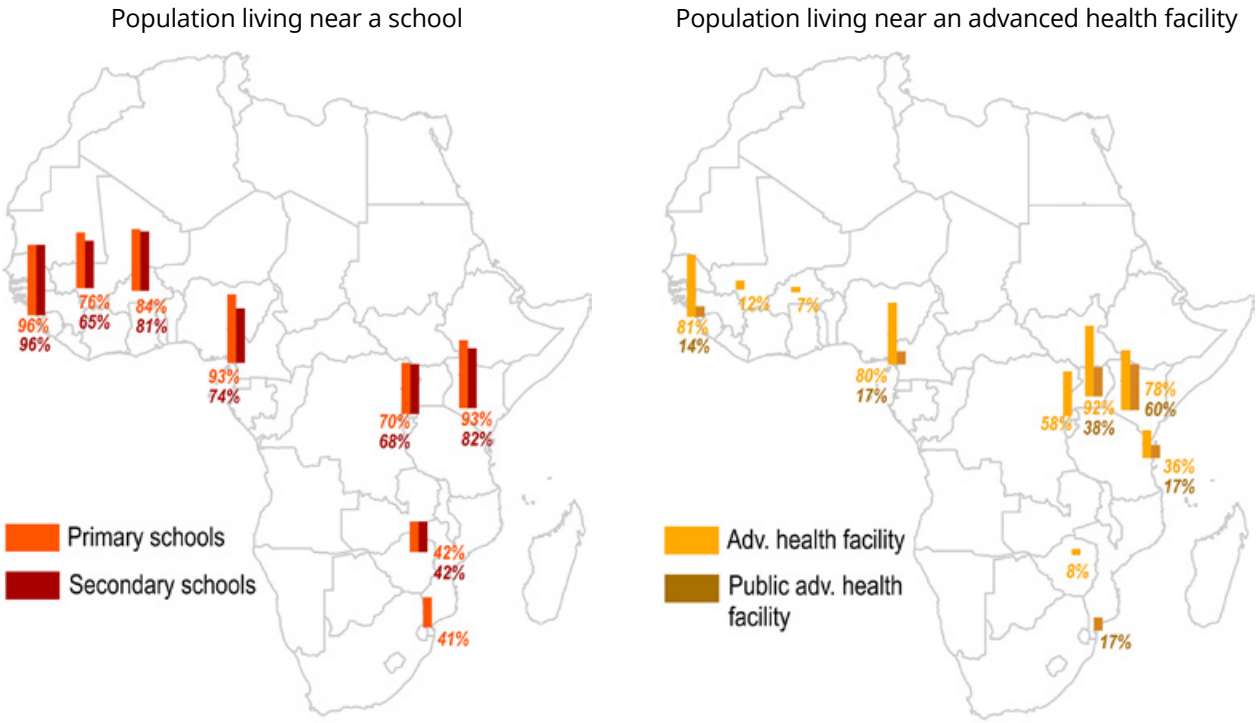
Source: Estimates by study team

In all the cities in scope, advanced healthcare facilities, especially hospitals, are, on average, better accessible from the public transport networks compared to either primary or secondary schools. In Harare and Maputo, all advanced care facilities are within walking distance, and in most other cities the share is around 95%. Only in Conakry a relatively high share of advanced health facilities (19%) is not within walking distance to the public transport network; however, accessibility of health facilities is still better than that of schools. In Ouagadougou, advanced health facilities are significantly more likely to be directly accessible from the bus network compared to schools: 94% of advanced healthcare facilities and all of hospitals specifically are within 1 km of a bus route. Public advanced healthcare facilities are nearly equally accessible as private ones to transport networks in most cities; exceptions are Conakry and Douala, where in the former case public facilities are in fact more likely to be directly accessible from the minibus routes, while in the latter case it is the opposite.

The second indicator of land use planning that ultimately matters for people to be able to easily reach education and health opportunities is the extent of land use diversity or, more specifically, the **direct presence of health facilities and schools in residential neighborhoods** – i.e., the opposite of a land use pattern where the residential use is segregated. Thus, while the first indicator measured the facilities' proximity to transit, the second looks at the proximity of people to the facilities. Partly due to the larger number of schools compared to healthcare facilities in most cities, a significantly higher share of people in all ten cities live within a walking distance of at least one primary school and at least one secondary school than near an advanced healthcare facility. This is especially the case for primary schools, where upwards of 90% of the population live within a kilometer of a school in Conakry, Douala, and Nairobi, and above 70% of people in the other cities except Harare (42%) and Maputo (41%). The direct presence of secondary schools in residential neighborhoods is slightly lower, with between 65% and 96% of people living in direct proximity to at least one school, except for Harare where the share is only 42% (data on secondary school locations was not available for Maputo). Direct walking access is yet lower to public secondary schools specifically: only 51% of the residents of Conakry and 24-27% of those on Douala and Ouagadougou could reach such a facility within a kilometer of their home.

The share of population living near a primary school is closely correlated with the number of schools per capita. It is highest in Conakry, where a primary school is available per 1,168 people, and declines continuously as the size of population per school increases, reaching over 14,000 people per primary school in Harare and approximately 12,000 in Maputo, the two cities with the lowest shares of population living near a primary school. In the case of secondary schools, the relationship is less clean; while it holds for most cities, Douala and Nairobi stand out as having very high populations per secondary school (16,000-18,000) but also very high shares of people living near a secondary school (74% and 82%, respectively). This suggests that secondary schools in these cities are present exactly in the residential neighborhoods with the highest population densities.

Figure 13: Share of city population within walking distance (1 km) from nearest school or advanced healthcare facility (%)



Source: Estimates by study team

In comparison to schools, it is less common to live near an advanced healthcare facility. In part due to the somewhat varying categorization of facilities in the "advanced" group across the cities but also due to true differences in the degree of land use mix, the residential proximity to these facilities varies significantly. While in Bamako, Harare, and Ouagadougou less than 15% of people live near an advanced healthcare facility, in Conakry, Douala, Kampala, and Nairobi over three-quarters of the population do. Residential proximity to public facilities is significantly lower, however, with less than one-fifth of people in most cities living within direct walking distance; exceptions are Kampala and Nairobi where this share is at least twice as high.

Despite the carrying definitions of "advanced" facilities across the cities, the availability of such facilities per population is quite closely correlated with the share of people living directly near at least one such facility. Namely, the shares are among the lowest in Ouagadougou and Bamako, where a facility is available per every 180,000-200,000 people; they are the highest in Kampala and Conakry where a facility is available per 5,000-10,000 people.

6.4. Accessibility to health and education facilities by public transport

6.4.1. Comparison across cities

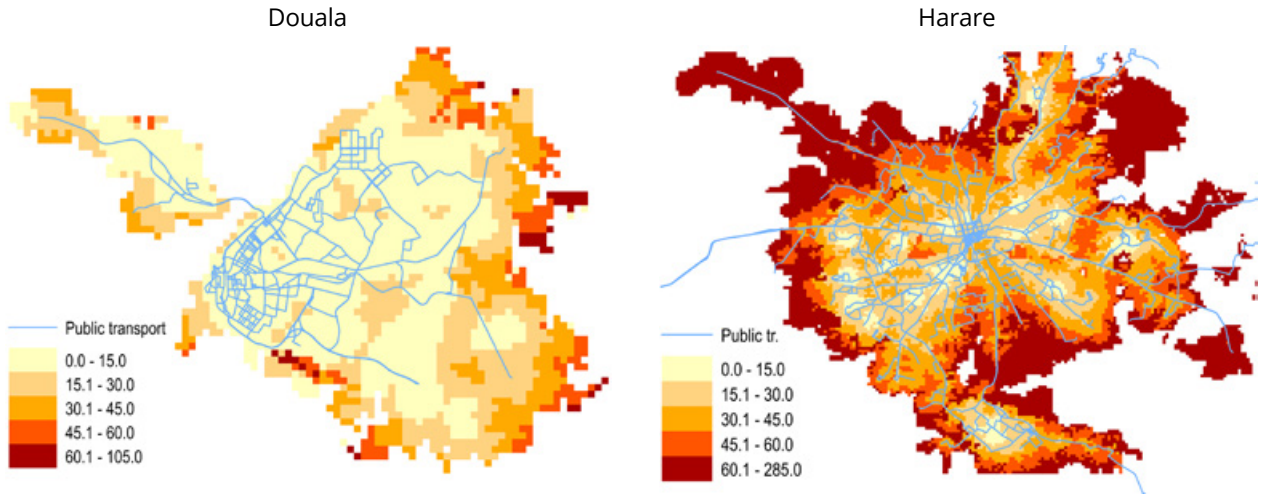
This section presents the estimated physical accessibility to schools and health facilities in the ten cities, although direct comparison is not always possible, at least with respect to accessibility to healthcare facilities, given the differences in how the cities classify their healthcare institutions. The direct benchmarking of cities is more possible in the case of primary and secondary schools, where the classification is much more comparable. In the case of primary schools, where walking was indicated in the existing household surveys to be the by far the most dominant mode of transport, the analysis also illustrates the extent to which public transport provides an accessibility improvement ("value added") over walking-only.

To calculate accessibility, we rely on the previously presented data on the spatial presence and speeds/ headways of transport systems, the spatial distribution of health and education facilities in each city, and the spatial distribution of the population. We first use the transport and transit network to estimate the travel time from each location in the city to its nearest health or education facility. Then, accounting for the spatial distribution of people, we compute the average accessibility in the urban area and the more detailed accessibility distributions/ curves presented later in this chapter.

Access to healthcare facilities

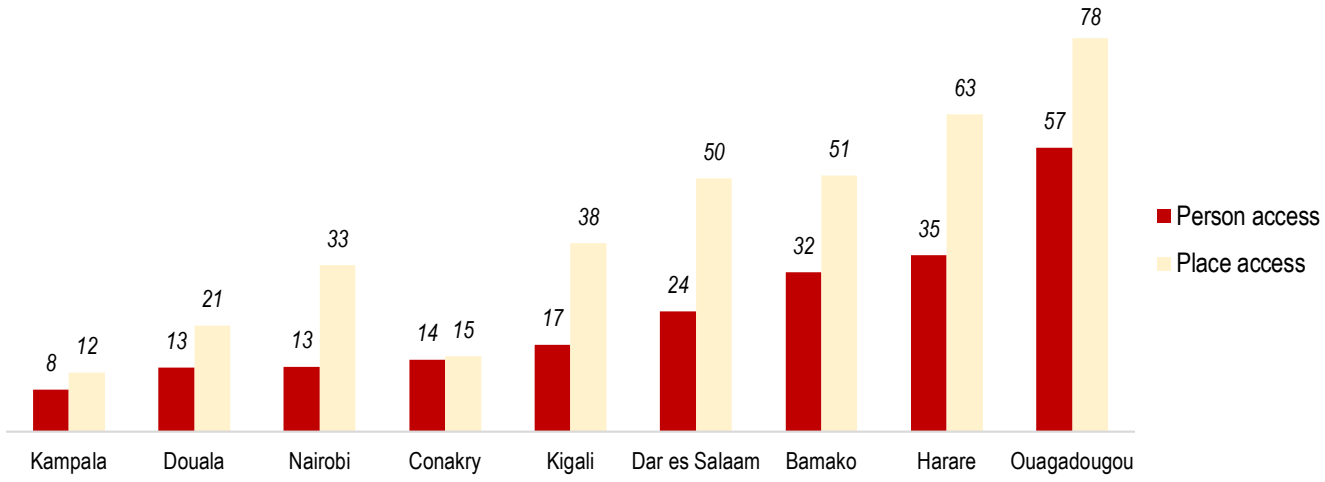
In accessing healthcare, lack of public transport was reported in the interviews with human rights experts to leave people relying on private transportation (bikes, motorcycles, and taxi cars), which are unreliable and costly for many, especially for the sick; this was reported to be an issue specifically by the experts working in Burkina Faso, Zimbabwe, and Rwanda. In Zimbabwe, peripheral areas were noted to have worse road connectivity and lack of transport or ambulance services. In Ethiopia, which this spatial analysis does not cover due to lack of reliable public transport data, the experts noted that some hospitals are not next to roads where there is public transport or have stops for public transport, and therefore must be accessed by private means.

Figure 14: Travel time by public transport to nearest advanced healthcare facility in Douala vs. Harare (min)



Source: Travel time estimates by study team

Figure 15: Travel time by public transport to nearest advanced healthcare facility (min)



Source: Travel time estimates by study team

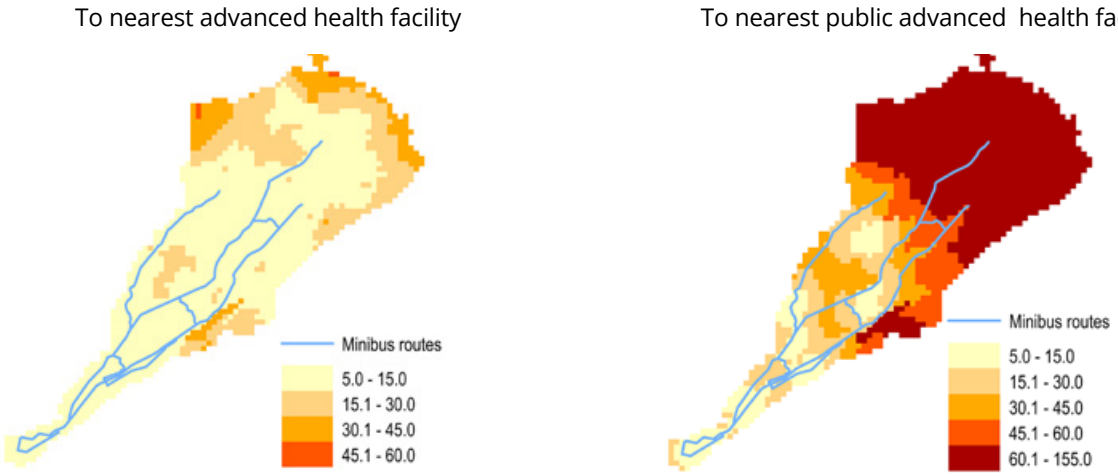
Indeed, the spatial analysis suggests that public transport based accessibility to healthcare facilities that provide "advanced" care services varies quite significantly across the cities in scope of the study. While the average resident of Kampala, Douala, Nairobi or Conakry can reach such a facility by public transport in less than 15 minutes, the residents of Harare or Ouagadougou have to travel over 35 minutes (in Ouagadougou, nearly an hour).

World Bank (2019b) estimated that, during rush hour, only 16% of Bamako residents are within 30 minutes of a hospital if taking public transport, compared to 76% of car users. Other types of healthcare facilities were estimated to be accessible by 81% percent of urban population within a 30-minute walk and by 84% using public transport – suggesting a very low "value-added" of the public transport system.

The difference between average "person access" (i.e., the travel time for the average person living in the city) and average "place access" (travel time from a given location within the city) in a way illustrates how strategically people choose where to live – either intentionally or as a result of the existing housing availability – with respect to the public transport network and/or locations of the healthcare facilities. This difference appears to be quite large in Dar es Salaam, where despite relatively poor "place access" to advanced healthcare facilities, the "person access" is relatively good. The difference is smaller in Kampala, Douala and Conakry – cities where accessibility is relatively good regardless of the metric.

What is important for many of the cities' residents, especially those with less means, the nearest advanced healthcare facility is not always a publicly operated one. As noted previously, in some cities the number of privately (for-profit) operated facilities vastly exceeds the public ones. The resulting difference between being able to easily access any advanced healthcare facility versus a public one is illustrated in Figure 16 specific to Conakry, where it is quite dramatic in large parts of the city; however, some level of "penalty" for people who are dependent only on public facilities because of affordability considerations exists in all of the cities in scope.

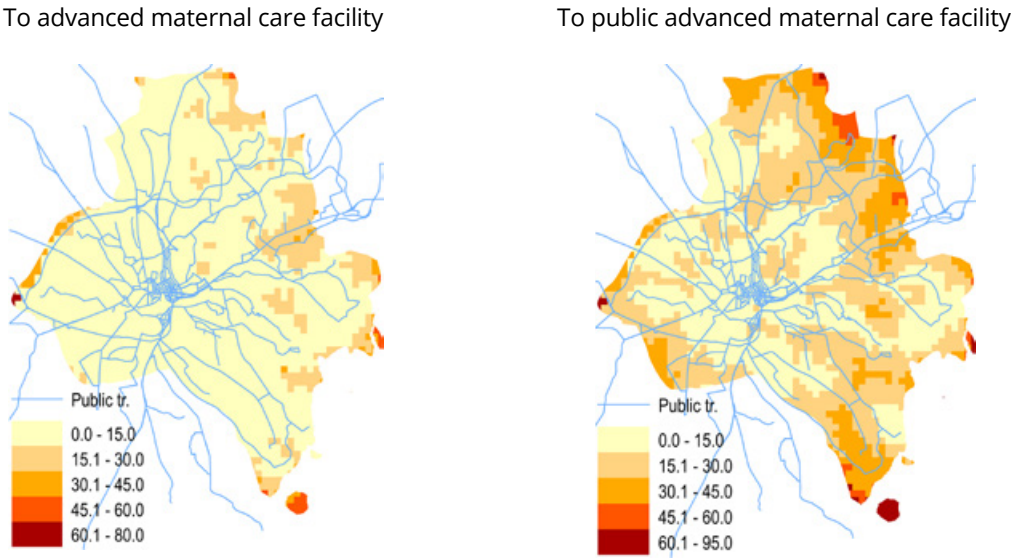
Figure 16: Travel time by public transport to nearest advanced health facility vs. nearest public advanced health facility in Conakry (min)



Source: Travel time estimates by study team

Across the five cities for which both all advanced healthcare facility and specifically publicly operated advanced healthcare facility locations are available, the nearest public advanced facility is, on average, further away by public transport. However, the size of the "penalty" of depending on public facilities (such has for affordability reasons) is considerably lower in Nairobi, Kampala, and Dar es Salaam, where the difference in average travel time by public transport to any facility versus a public facility is about 8-10 minutes, compared to Conakry, where it is nearly an hour. In the entire northern third of Conakry, residents would have to travel over an hour to a public facility; this accessibility-disadvantaged area also corresponds to the part of the city that has the lowest economic activity as measured by nighttime lights intensity, a common clue of elevated levels of poverty.

Figure 17: Travel time by public transport to nearest advanced maternal care facility in Kampala (min)



Source: Travel time estimates by study team

Access to schools

As highlighted by the interviewed human rights practitioners, accessibility to schools – especially those that are affordable to families – is low for at least some share of students. In Rwanda, although the schools are within "walking distance", this distance can be long for some. In Uganda, due to affordability, children reportedly have to walk long distances to reach schools they can afford. People in the peripheries have poorer access to transports and face more constraints to access educational services, as noted in the case of Ethiopia.

In both Uganda and Zimbabwe, the interviewed experts highlighted the particular accessibility disadvantage faced by children living in the newer settlements, who do not have access to education near their homes and might have to travel a long distance to a school.

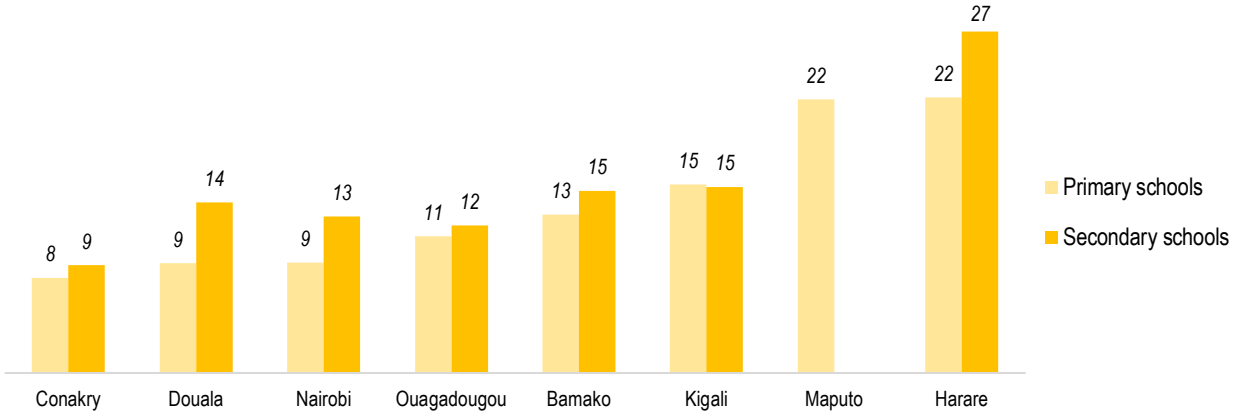
As in the case of healthcare facilities, the experts highlighted the presence of a "dual system" in education: there can be physical accessibility, but public provision is of poor quality in many of the countries. Those who live far away or in areas with less population density – as mentioned in the case of Burkina Faso, Kenya, and Zimbabwe – reportedly have access to lower quality educational services. Rwanda was highlighted as an exception, with education generally considered very accessible.

High-resolution data on the spatial distribution of school age children specifically is not available. Assuming that it mirrors that of the overall population distribution, we find that, for the average child, accessibility to primary schools in the cities in scope is relatively good, with travel times by public transport to the nearest school being in the range of 8-11 minutes in Conakry, Douala, Nairobi, and Ouagadougou. Even in the cities with comparatively poorer accessibility – Maputo and Harare – a primary school is within reach, on average, within about 22 minutes by public transport.

> **"The traditional old locations, they have clinics, they have schools, they have standards, but now with the recent new settlements; those ones are very far away from clinics, very far away from critical health services, and even from schools. So you can even find a child who is commuting a distance of more than 60 km, to and from, and for a small child who is supposed to be attending kindergarten, that's too demanding, physically and emotionally and even intellectually for that child, by the time she gets into class, she is already tired and she is not concentrating."**
>
> — Zimbabwe

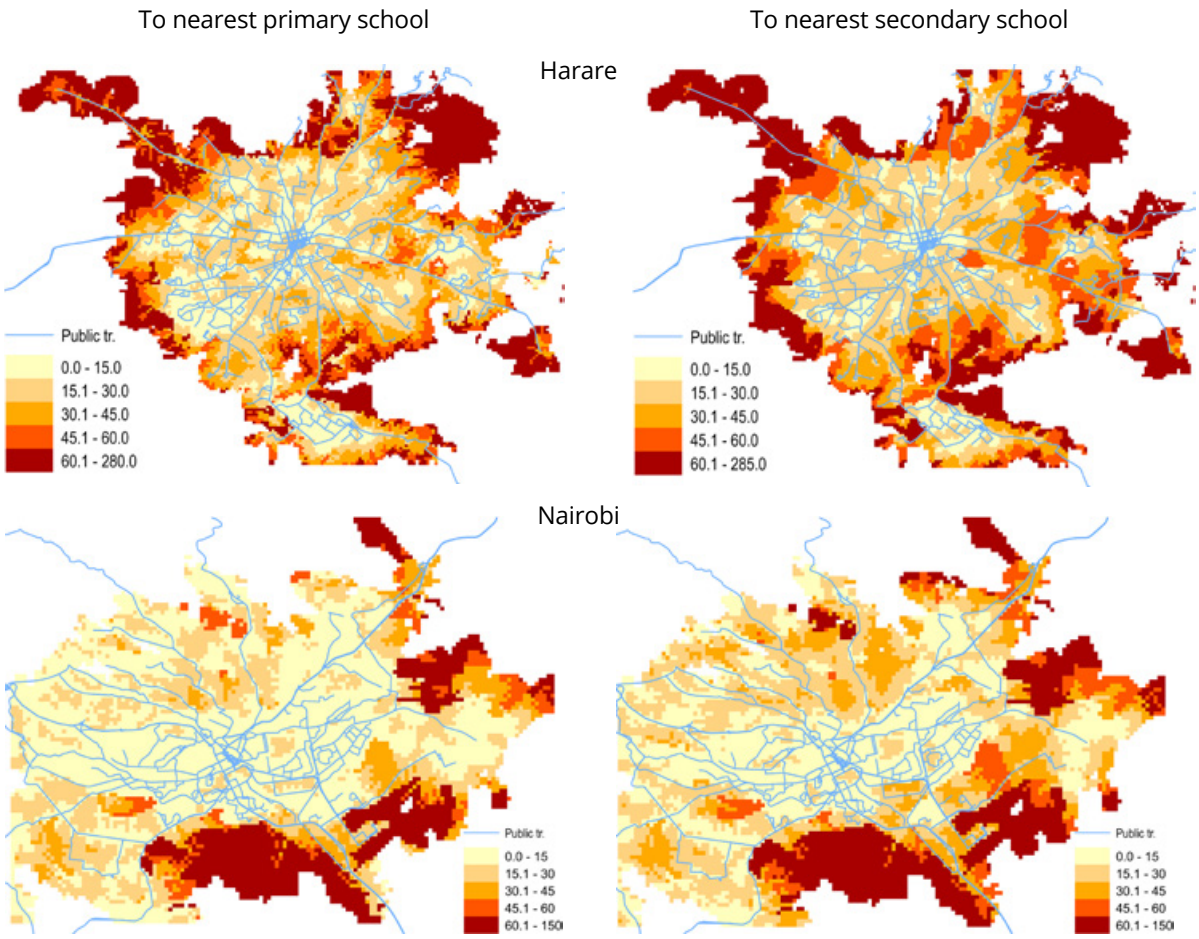
Across all the cities in scope except Kigali, public transport based accessibility is better – sometimes significantly so – to primary schools than secondary schools, which is also partly explained by the much wider presence of the latter in most cities. The difference between accessibility to primary schools compared to accessibility to secondary schools is larger in Harare, Douala, and Nairobi than in Conakry, Kigali, and Ouagadougou. In absolute terms, children in Conakry, on average, have the best accessibility by public transport to a secondary school across all the cities in scope with the caveat that they travel to the nearest school to home, regardless of its specific characteristics.

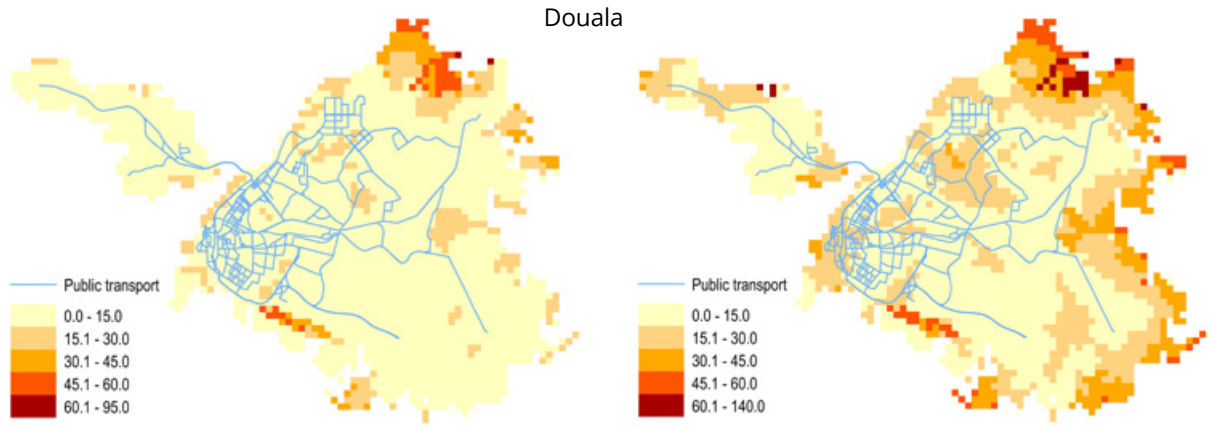
Figure 18: Average travel time by public transport to nearest primary school and nearest secondary school (min)



Source: Travel time estimates by study team

Figure 19: Travel time to nearest primary school vs. nearest secondary school in Harare, Nairobi and Douala

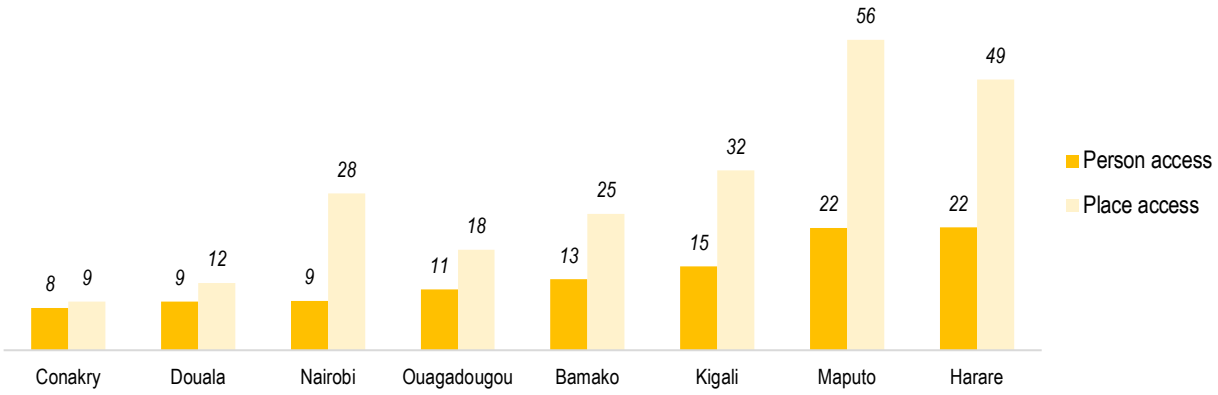




Source: Travel time estimates by study team

As in the case of advanced healthcare facilities, the average time to reach the nearest school in all of the cities is lower for the average city resident than for the average location within the city, indicating some level of "strategic" residential sorting to be near these important facilities and/or the public transport network that can improve accessibility to them. It is also indicative of the land use planning in the cities and the extent to which they promote mixed-use development rather than segregation of residential from other uses. The extent to which the "person access" is better than "place access" with respect to primary schools differs quite significantly, however, from very little – such as in Conakry, Douala, and Ouagadougou, where the average travel time by public transport is only a couple of minutes longer for the average location in the city than for the average city resident – to very considerable, such as in Kigali, Nairobi, Maputo, and Harare, where the travel time for the average city resident is only one-third to one-half that of the average location.

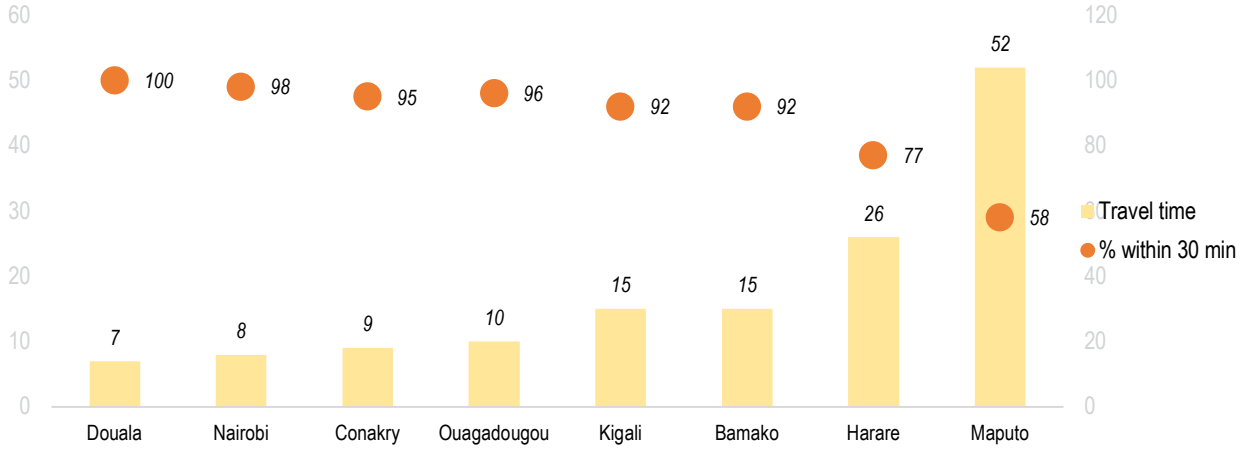
Figure 20: Travel time by public transport to nearest primary school (min)



Source: Travel time estimates by study team

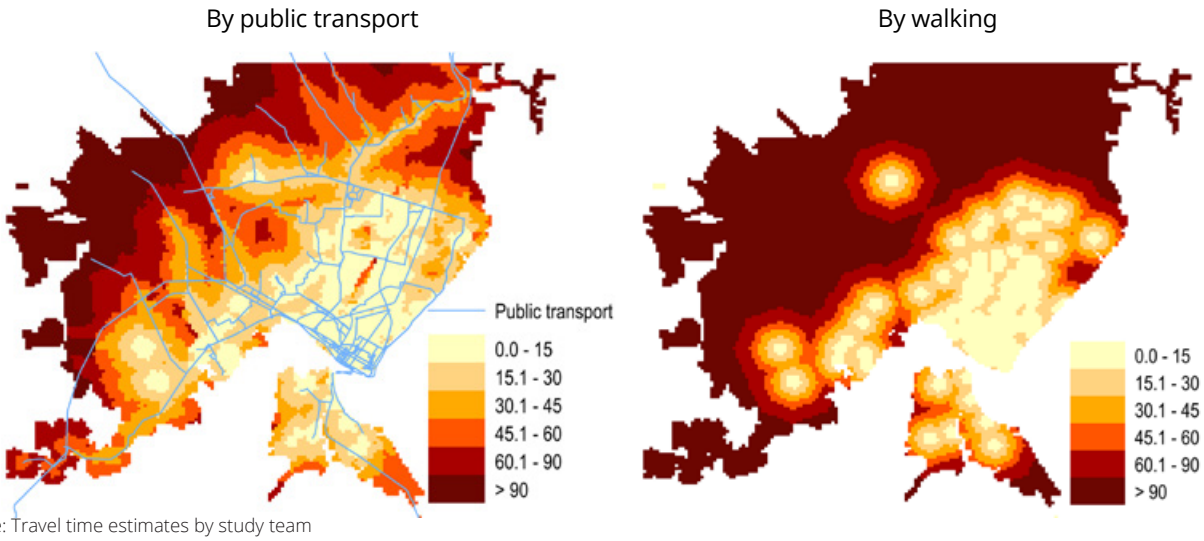
Given that in all of the cities in scope, existing survey data and interviews with locally present human rights organizations suggests that the vast majority of children walk to school, especially at the primary school level, and given that walking may be the only option for households unable to afford other modes, we conducted a comparative analysis for these specific facilities to illustrate the extent to which the existing public transport systems provide an accessibility benefit compared to walking. At the same time, of course, for at least some share of the students in each city walking may not be an option in practice – unfortunately, the existing population distribution or survey data does not allow identifying locations in the city where the children with special needs live, but a reasonable assumption would be that their presence is proportional to the overall population distribution.

Figure 21: Average walk time to nearest primary school (min) & population within 30-minute walk of a primary school (%)



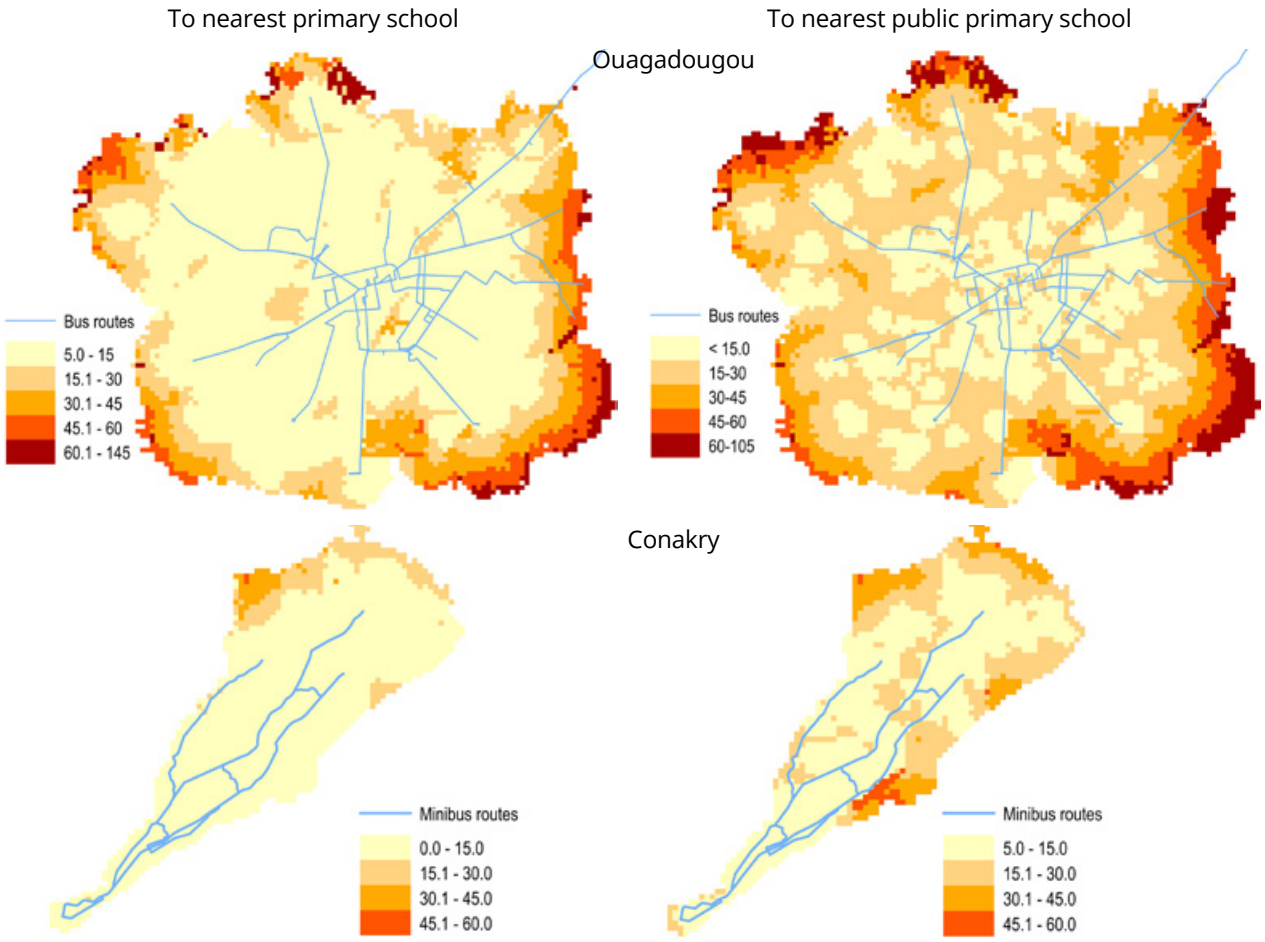
Source: Travel time estimates by study team

Figure 22: Travel time to nearest primary school by public transport vs. by walking in Maputo (min)



Source: Travel time estimates by study team

Figure 23: Travel time by public transport to nearest primary school vs. nearest public primary school (min)



Source: Travel time estimates by study team

Across most cities for which primary school locations were available, accessibility by walking is found to be relatively good, with average travel times not much exceeding the average travel time associated with traveling by public transport. For example, in Douala, Nairobi, Conakry, and Ouagadougou, over 95% of the physically healthy children[91] can reach a primary school on foot within 30 minutes, and the average child can walk to the nearest primary school within about 7-10 minutes. Access to primary schools by walking is comparatively worse in Harare, where the average walk time to a primary school is 26 minutes, while in Maputo the average is over 50 minutes and only 58% of all children are within a 30-minute walk of a primary school.

Accessibility to *public* primary schools specifically could be calculated for only a subset of the cities where data on the public vs. private status was reliably available: Ouagadougou and Conakry. Disaggregated data by public vs. private status for secondary schools is also available for Douala. Across the cities, accessibility is significantly lower to public schools than to *any* school, which matters in particular for those residents who cannot afford to send their children to private schools. For example, in Ouagadougou, the average resident has to travel 18 minutes to reach the nearest public primary school, compared to 12 minutes to a private primary school. In case of secondary schools the difference between nearest public and nearest private school access is even larger – 12.5 minutes to private, compared to twice that to public.

91 The analysis assumes walking speed of 3 km/h.

6.4.2. Transport and land use planning as drivers of cross-city inequality in accessibility

More so than in the case of secondary schools or advanced healthcare facilities, average travel times to the nearest primary school across the cities appear to be closely correlated with key transport and land use planning indicators. As might be expected, the correlation is the strongest with the **share of the city population living within walking distance of a primary school.** The correlation coefficient in this case is nearly 1, with the cities with more mixed land use, as measured by higher shares of population living within a kilometer of a primary school, having distinctly lower average travel times to the nearest school. Similarly, the relationship is also quite strong with respect to the **average population per primary school**: average travel times are lowest in cities like Conakry, Douala, and Ouagadougou, where a primary school exists per every couple of thousand inhabitants, and they are the highest in cities like Harare and Maputo where population per primary school exceeds 12,000. Finally, the **overall average population density of a city** is also quite closely correlated with how long an average city resident has to travel by public transport to reach the nearest primary school: average travel times increase as population densities decline, with the average residents of the denser cities like Conakry, Douala, and Nairobi seeing distinctly lower travel times.

In contrast, the correlation of average travel times to the nearest primary school is weak with any of the two variables that characterize the **extent to which the city development is transit-oriented**: the share of population living within walking distance of transit and the share of primary schools located within walking distance of transit. Exceptions are Douala and Nairobi which perform among the best both in terms of the average travel times to the nearest primary school and shares of population living directly near transit.

The overall weak correlation could be explained by the fact that in the cities like Ouagadougou and Conakry, where, mostly due to the sparsity of the public transport networks, a lower share of people than in other cities live directly near a transit route and where a lower share of primary schools are directly near transit, these transport deficiencies are more than compensated for by a larger number of primary schools per capita than in the other cities and by the wide presence of primary schools directly within residential neighborhoods. However, this might also be at least partly due to the technical performance (speeds, headways) of the public transport services, which reduce the value of being near a public transport route in some cities (e.g., Ouagadougou), and the sheer distances that have to be traveled due to the more sprawl-like nature of the urban area in yet others (Harare, Maputo). Finally, the fact that population proximity to transport doesn't appear to translate into better primary school access may have to do with the way informal transport routes – which dominate many of the cities in scope – are allocating themselves: as also noted by the interviewed human rights practitioners, the informal transporters likely prioritize routes that are profitable, such as those used for daily commuting to jobs and major economic activity centers.

In the case of accessibility to secondary schools, the overall correlation patterns with transport and land use planning characteristics are similar although the magnitudes are lower. The correlation remains by far the strongest with the share of population living within a walking distance to a secondary school - i.e., the direct presence of secondary schools within residentially dense neighborhoods. On the other hand, accessibility to secondary schools is much more weakly correlated

with the two other land use planning characteristics that mattered much more in the case of primary schools: overall population density of the city and the average size of population per secondary school. This might be due to some individual "outlier" cities such as, for example, Douala, in which population density is the highest across the ten cities while the average travel time to the nearest secondary school is longer than in several other cities, likely due to the comparatively low share of its population living directly near a secondary school.

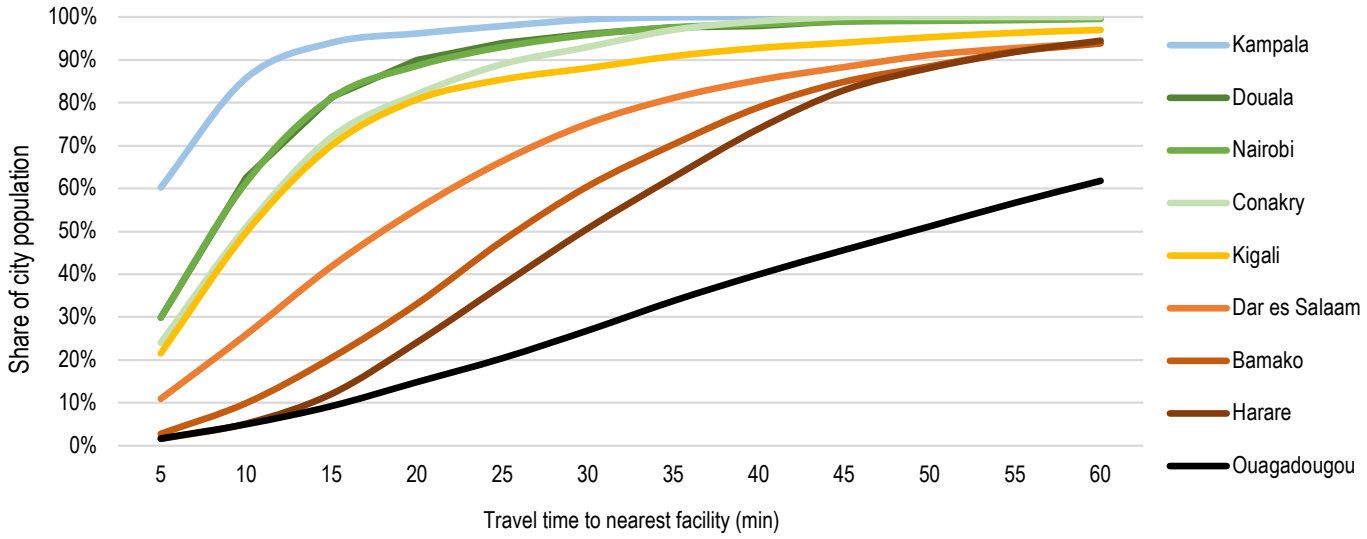
Lastly, accessibility to advanced healthcare facilities stands out as being comparatively highly correlated with at least one transit-oriented development indicator, namely, the share of people living within walking distance of transit. Thus, average travel times to nearest facility are among the lowest in cities like Kampala, Douala, and Nairobi, where the vast majority of residents live near at least one public transport route, and it is by far the highest in Ouagadougou, where less than half of the population can reach a bus route within a 1-km radius from home. This might be indicative of the "value added" of public transport services specifically for reaching these types of facilities; however, it could also be just a spurious correlation, in that the same cities in which many people live near transit also have wider availability of advanced healthcare facilities as measured by the average population per facility. For example, in Ouagadougou, the very long average travel times are likely only partly due to the lack of transit-oriented development of the urban area or the long bus service headways, and are at least to some extent driven by the sheer sparsity of advanced healthcare facilities per population, which means that the trips are long even for many of those who can easily reach a bus service. This same reason probably also explains the long average travel times in Bamako despite the high share of its residents living within walking distance to a public transport route.

Nevertheless, also accessibility to advanced healthcare facilities, similarly to accessibility to schools, remains the most strongly related to the direct presence of healthcare facilities within residential neighborhoods ("mixed land use") as measured by the share of population able to reach at least one such facility within a 1-km radius. Thus, travel times are distinctly the highest in Ouagadougou, Harare, and Bamako, where only between 7 and 12 percent of the urban residents live directly near an advanced health facility, and by far the lowest in Kampala, Douala, and Conakry, where over 80 percent do.

6.4.3. Spatial inequality within cities

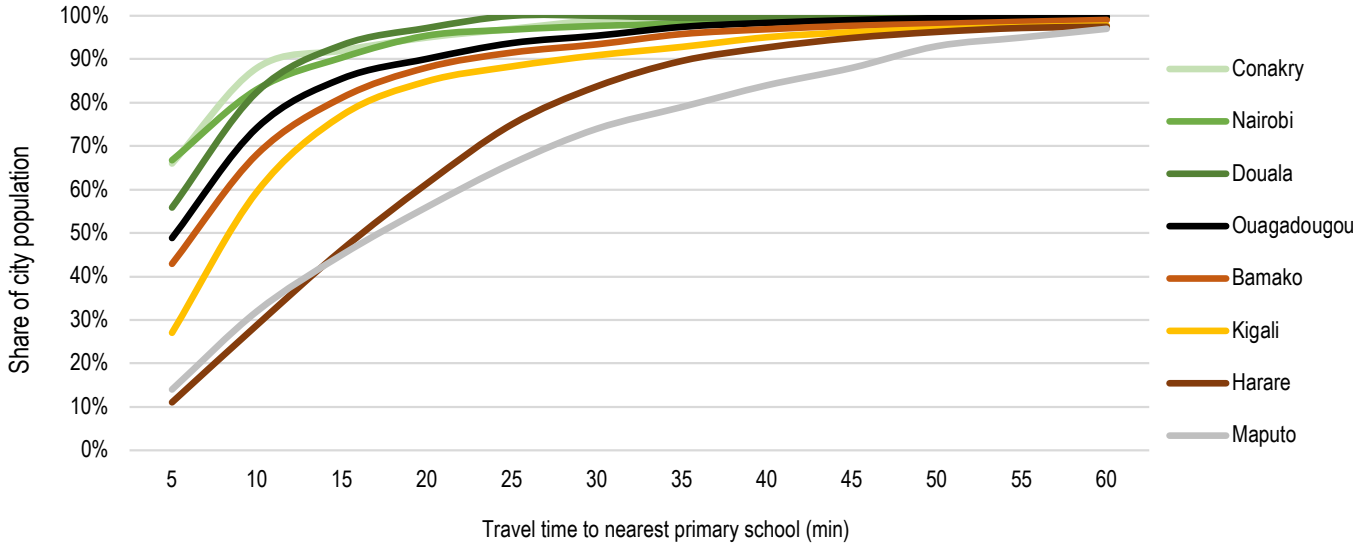
To better understand the patterns of accessibility inequality not only across but also within the cities, we apply inequality metrics similar to those well established in the economic literature. Rather than deriving a single indicator of inequality, akin to a Gini coefficient, however, we derive accessibility-population curves to illustrate, across cities and across different facility types within a given city, how access is distributed – how equal or unequal it is – in terms of the cumulative share of the population that can reach the facility within a certain time threshold. The visualization also reveals what share of the population in each city and with respect to each type of health or education service is "accessibility poor", as measured by inability to reach even the nearest facility within an hour of travel by public transport. In the case of schools, it could be argued that a more reasonable metric for accessibility poverty is a travel time exceeding half an hour, given that the trip there and back to school and back is made every day.

Figure 24: Share of population able to reach an advanced healthcare facility by public transport within the time threshold



Source: Travel time estimates by study team

Figure 25: Share of population able to reach a primary school by public transport within the time threshold



Source: Travel time estimates by study team

Figure 24 visualizes inequality in advanced health facility access within each of the cities where geo-located facility data was available. As noted before, a direct benchmarking of cities against one another is not the indention, given the inevitably varying definitions of "advanced health facilities" in each of them. Rather, it illustrates the distribution of accessibility within a given city and the share of population that is particularly accessibility-poor. For example, it shows that in Ouagadougou, nearly 40% of all people are accessibility-poor, compared to less than 10% in the other cities. Key metrics that can be used to assess the inequality of accessibility include the time threshold that corresponds to 50% of the population, and the rate at which the curves relating population share and travel time approach 100% (indicating universal accessibility). While in Douala, Nairobi, Conakry, and Kigali the time threshold corresponding to at least half of the population having access is about 10 minutes, with the share with access increasing quite rapidly as the time threshold increases, in Bamako and Harare the time threshold corresponding to at least half of the population having access is closer to 25-30 minutes. In Dar es Salaam, while over half of the population can access an advanced healthcare facility within about 15-20 minutes, the share of population with access does not increase as rapidly thereafter, and even at a 40-minute threshold still about 15% of the city's population remains unserved.

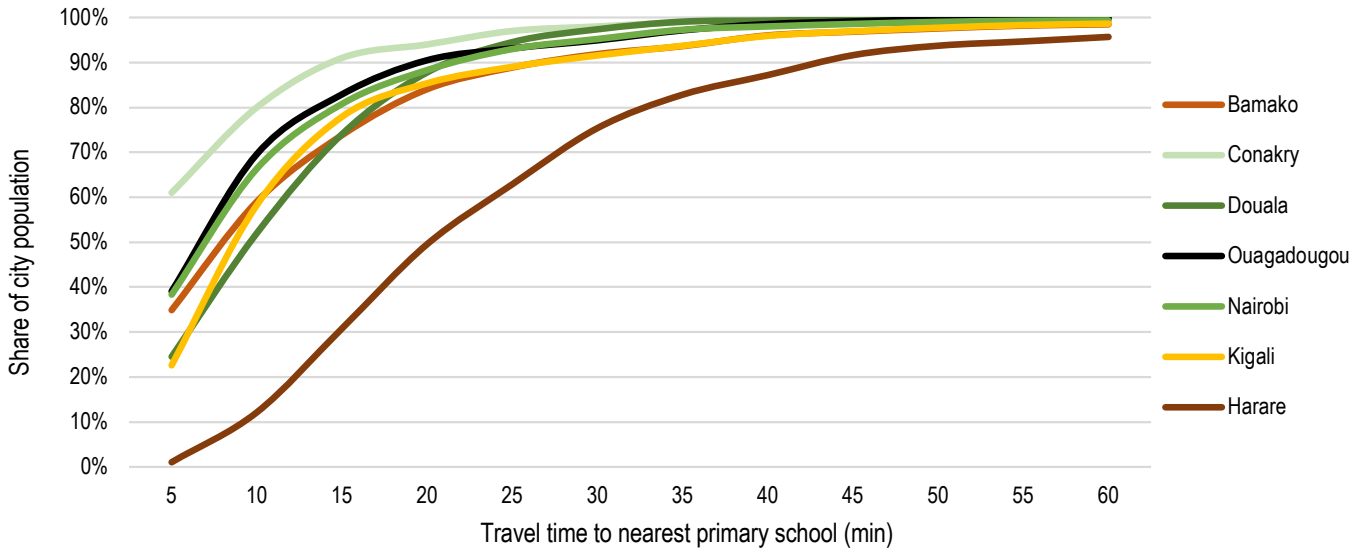
A direct comparison of the cities can more reliably be made for accessibility to schools, of course assuming their geo-located data is equally reliable. In half of the cities – Conakry, Nairobi, Douala, and Ouagadougou – half or more of the population can reach at least one primary school by public transport (or just by walking) in within five minutes; however, in Ouagadougou, the share of the population with access does not increase as rapidly thereafter, and about 10% remain unserved even assuming a travel time threshold of 20 minutes (see Figure 25). And, while all of Douala's population has access to at least one primary school if assuming travel time of 25 minutes, in Ouagadougou 1% of the population remain without access even at a time threshold of 50 minutes. A similar pattern can be observed in Kigali, although a lower share of its population than Ouagadougou's can access a primary school within 5-10 minutes. Lastly, in Maputo and Harare, where in both cases the average travel time by public transport to the nearest primary school is estimated at 22 minutes, the accessibility distribution patterns slightly differ: in both cities about 10% of the population has a primary school within reach even assuming a travel time of just 5 minutes; however, the share of population with access increases more rapidly in Harare than Maputo, with 90% of Harare's population having access at a 35-minute threshold, compared to 80% of Maputo's. If assuming an accessibility poverty threshold of half an hour, only in Douala no one is accessibility poor, compared to between 1 and 5 percent of the populations of Conakry, Nairobi, and Ouagadougou, between 7 and 9 percent of those of Bamako and Kigali, and as many as 15-25% of Harare and Maputo's.

If assuming – as is evidenced from existing survey data – that most children commute to school on foot, the share of the population that is actually accessibility poor is nearly 50% in Maputo and nearly 30% in Harare. In Conakry, the share of accessibility poor children increases from just 1% if assuming that public transport is used to commute to about 16% if assuming that all children commute on foot. This also illustrates the relatively high "value-added" of the existing public transport system for primary school access specifically, or, specifically, its role in improving access for those who do not have a primary school in direct vicinity and would otherwise have to commute for over half hour. In contrast, in Ouagadougou, the accessibility distribution among the

city's population is much more similar whether travel by bus or on foot is assumed, indicating a low benefit provided by the bus system. For example, at the accessibility poverty cutoff time of half hour, the same share of the population – 5% - are accessibility poor regardless of whether travel by bus or on foot is assumed. Even assuming an hour of travel as acceptable, in all cities but Douala at least some share of the population remain unable to reach even a single primary school – in Conakry this share is 10% and in Maputo – 28%.

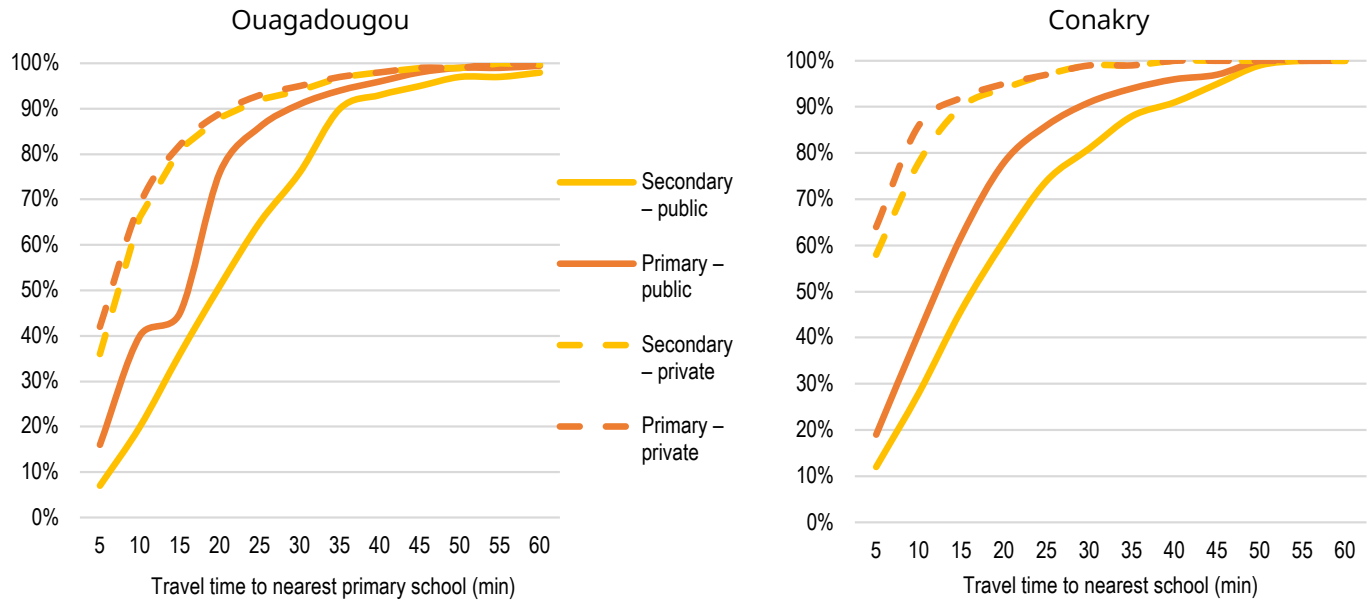
Accessibility distribution within cities is similar also with respect to secondary schools. Secondary school locations could not be identified for Maputo; therefore, it is not included in this comparison. Harare again stands out as having lower overall accessibility and a larger share of population characterized by accessibility poverty: one-quarter of all children living within the boundaries of the "functional city" are unable to reach a secondary school by public transport with the accessibility poverty threshold of half an hour, while for 4% travel times exceed a full hour. The other cities in scope are more comparable to one another, with 20-40% of all children having a secondary school within immediate reach, and relatively few having to travel over 30 minutes. Conakry stands out as a positive exception, with most of its population within immediate reach of a secondary school. In Conakry, as well as Douala and Ouagadougou, accessibility is universal if assuming a travel time threshold of an hour. However, at the stricter accessibility poverty threshold of half an hour, in all of the cities at least some share of the population remains unserved, ranging from 2% in Conakry to 8% in Bamako and Kigali and the aforementioned 25% in Harare.

Figure 26: Share of population able to reach a secondary school by public transport within the time threshold



Source: Travel time estimates by study team

Figure 27: Share of population able to reach specific types of schools by public transport within the time threshold in Ouagadougou and Conakry



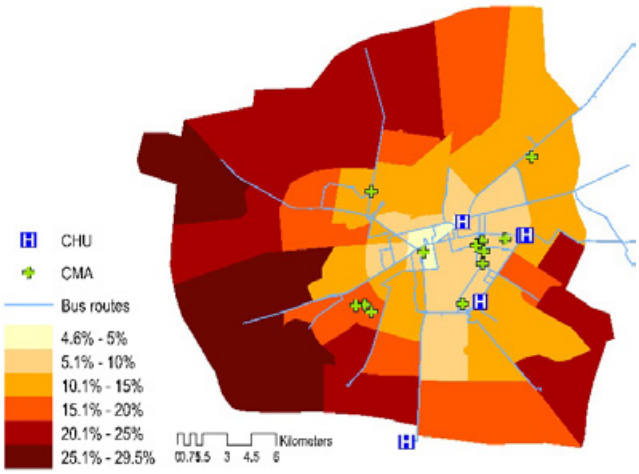
Source: Travel time estimates by study team

6.4.4. Accessibility gaps in high-poverty neighborhoods

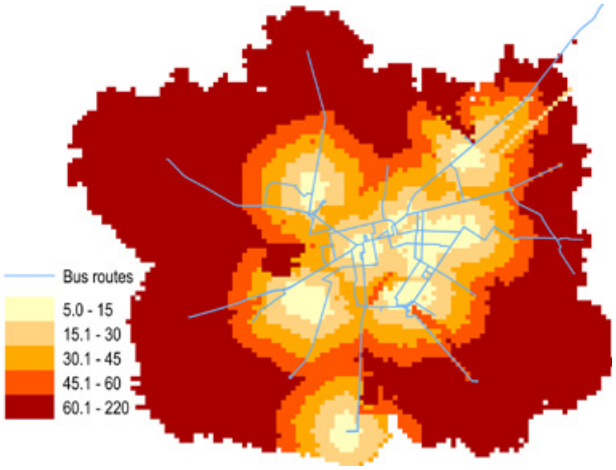
Complementing the within-city accessibility inequality analysis presented above, we analyze inequality of accessibility within cities by **relating the mapping of accessibility with the mapping of the city-specific poverty incidence.** We examine the spatial relationship between socio-economic status and accessibility to health and education opportunities in each of the cities; and how this relationship differs across the cities. In two of the cities – Ouagadougou and Douala – poverty mapping was conducted as part of the study in the absence of readily-available poverty maps but given that relevant household survey data was available. In several other cities (Kampala, Kigali, Maputo, and Harare), we using existing poverty maps to derive poor-specific accessibility indicators. In the remaining cities (Nairobi, Dar es Salaam, Bamako), we rely on indirect poverty proxies such as the spatial distribution of nighttime light intensity, a well-known indicator highly predictive of variability in the strength of economic activity, to provide qualitative insights on the accessibility penalties faced by those cities' lower income populations.

Figure 28: Poverty distribution and travel time by public transport to advanced healthcare facilities in Ouagadougou

Poverty incidence and advanced health facilities



Travel time to nearest advanced health facility (min)



Source: Estimates by study team

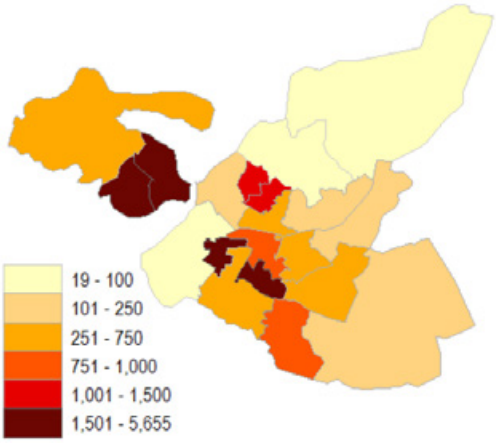
In Ouagadougou, the study team generated poverty estimates using household survey data from the 2017/2018 version of the Harmonized Survey on Household Living Conditions and based on the poverty line defined by the Burkina Faso National Institute for Statistics and Demography. Small-area estimation methods were then applied to estimate poverty at the city scale as well as at the level of individual administrative units (*secteurs*). Because accurate census data for Ouagadougou could not be accessed, a pseudo census was constructed using estimates of the size of the population using population density estimates created by Facebook's Data for Good project. To further increase the precision of poverty estimates, the team also incorporated additional geospatial data on land cover classification (built-up area, vegetation, and water) and the presence of forced displacement.

The estimated poverty rate in Ouagadougou is about 17% but exceeds 25% in individual secteurs in the city's southwest. The lowest levels of poverty are in the city center, where less than 5 percent of the population are poor. When expressed in density terms, the poverty distribution is fairly similar, with the exception of individual high poverty density *secteurs* in the city's north and east.

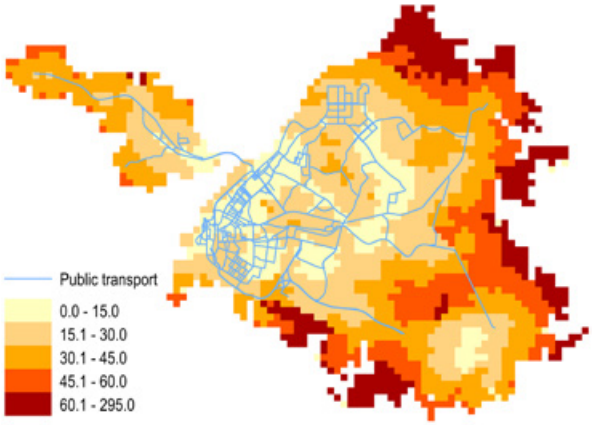
The sparse public transport network of Ouagadougou appears to reach the poorest parts of the city equally well, although its effectiveness in terms of ensuring accessibility to health and education facilities for the poor is low, as in the case of the overall population. Some differences in accessibility compared to the overall city population emerge at the secondary school level, where 56% of the city's poor are estimated to be able to access at least one public school within half hour of travel by bus, compared to 60% among the overall population, and accessibility for the poor is also slightly lower for private secondary schools with Catholic or Muslim affiliation specifically. The value-added of the bus system as compared to just walking is equally low for the poor population, with only a very marginal accessibility improvement for accessing some education facilities (e.g., public secondary schools) and none for others.

Figure 29: Poverty density vs. travel time by public transport to nearest public advanced health facility in Douala

Number of poor people per km² in 2020



Travel time to nearest public advanced health facility (min)



Source: Poverty estimates by the study team based on Cameroon Census 2005; travel time estimates by study team

The differences in accessibility between the overall population and the poor are greater with respect to advanced healthcare facilities. Compared to the overall population of Ouagadougou, the poor appear to be nearly equally able to rely on walking for accessing schools but are at a clear disadvantage for accessing advanced medical facilities: for example, over one-fifth of the city's residents could reach a hospital within an hour walk, compared to just 13% of the city's poor. If considering accessibility by public transport, the poor face a considerably higher average travel time to the nearest healthcare facility providing any advanced services – travel to a hospital is about 15 minutes longer by bus than for the overall population.

Poverty incidence at the neighborhood (*quartier*) level in **Douala** was estimated using data from the 2005 Cameroon census. The large sample size of the Census allows estimating poverty rates very precisely, and the data likely reflect long-term poverty and asset ownership well, even if at the expense of failing to capture more recent, short-term monetary shocks. Based on Cameroon's national poverty line[92] – about 150,000 of the city's residents in 2020 were estimated to be poor, representing 4.5 percent of the population. The poor in Douala are largely concentrated in the peripheries: in the south and the west however, in density terms, poverty pockets are present also in central Douala.

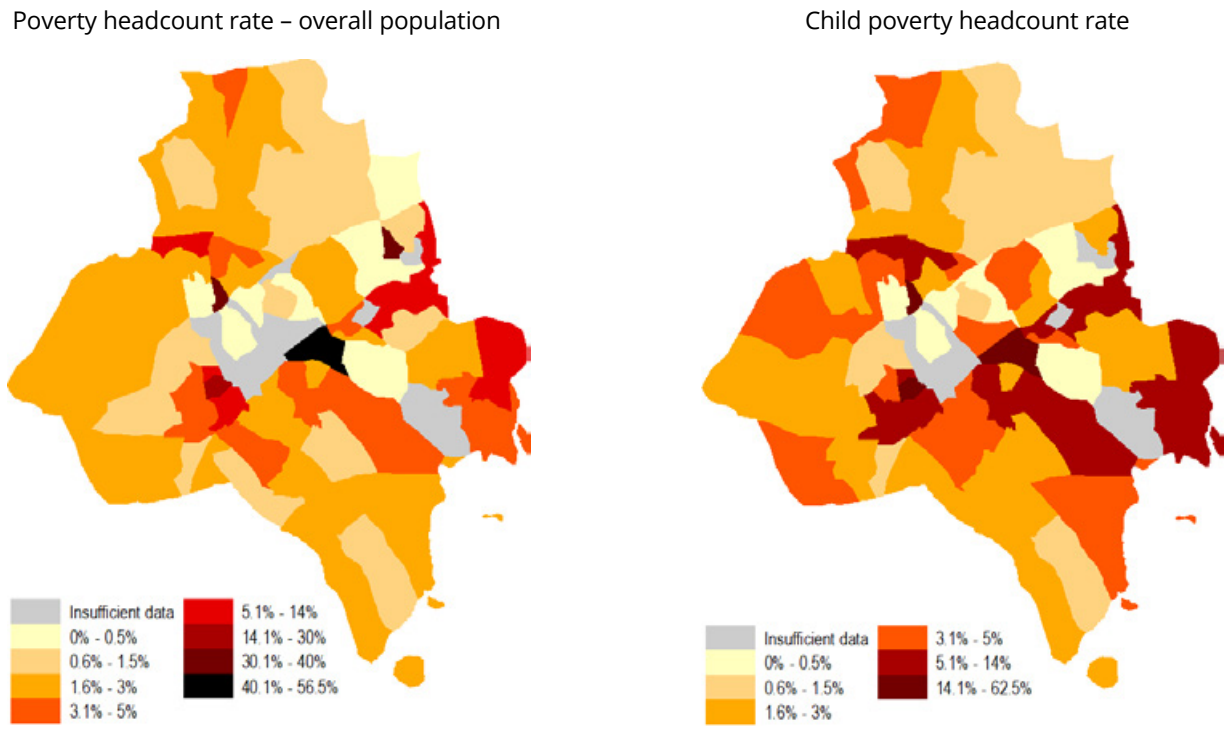
In Douala, the difference between accessibility to nearest advanced healthcare facility (clinic or hospital) and nearest *public* advanced healthcare facility is quite considerable – increasing from just 13 minutes, on average, by public transport if all advanced facilities are considered to nearly double that if the only facilities considered are public. In the case of primary schools, similarly, while the average person in Douala can reach the nearest primary school within 9 minutes by public transport, the nearest public primary school is, on average, more than 18 minutes away. In the case of secondary schools, the respective figures are 14 minutes and 22 minutes – hence, the "penalty" associated with only considering public facilities is slightly lower.

92 Fixed at CFA931 per day (about US$1.58). As a comparison, the global poverty line is set at US$1.90/day.

Some of the zones within Douala with low accessibility to public facilities specifically are in the city's south, where both the poverty incidence and poverty density per area are high. Indeed, when disaggregating accessibility indicators specifically for the city's poor population, travel times to the nearest public advanced healthcare facility is over half hour for the poor, compared to 25 minutes for Douala's overall population. In the case of secondary schools, the city's poor in fact have shorter average travel times to the nearest private facility but slightly longer – to a public one.

In Uganda, the national poverty rate has fallen at an impressive 1.6 percentage points per year since 2006, while the international extreme poverty rate fell by 2.7 percentage points per year, the second fastest reduction in extreme poverty per year in SSA during this time (World Bank, 2016b). However, implementation gaps in the delivery of public services such as education and health remain, threatening the achievement of the country's 2040 Vision of becoming a middle-income country. A detailed poverty assessment for Kampala was completed in late 2019 based on the 2016/17 Uganda National Household Survey and the 2014 National Population and Housing Census, conducted by the Uganda Bureau of Statistics in close collaboration with UNICEF and the World Bank (World Bank, 2019a). The assessment found that just 2.6 percent of the total population of Kampala live below the national poverty line; however, poverty rates in all of the city's Divisions are consistently higher among children than among the population as a whole. At the parish level, some parishes have very high poverty rates, exceeding 50 percent.

Figure 30: Poverty rate in Kampala at the Parish level, 2016/17 (%)



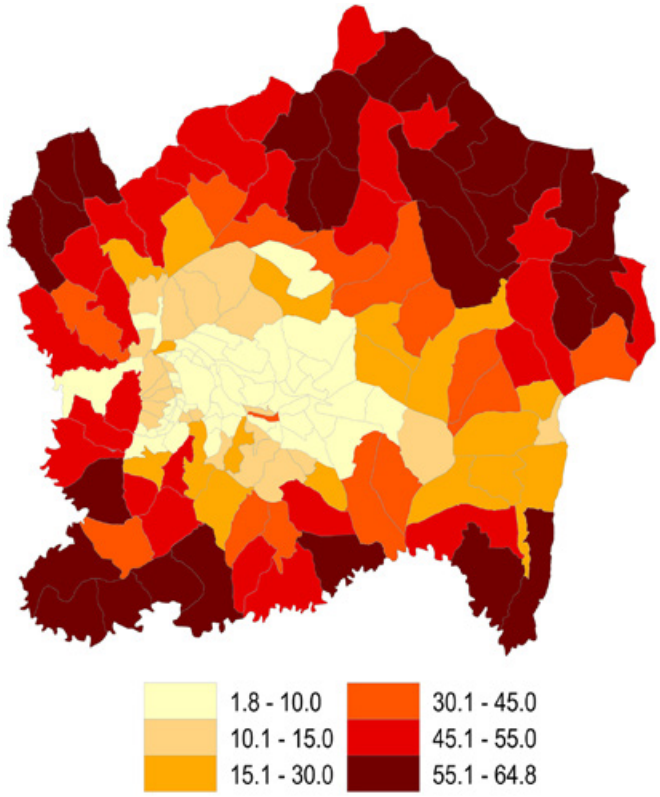
Source: World Bank (2019)

As already mentioned, reliable school locations data could not be identified for Kampala, and the accessibility analysis for this city is limited to healthcare facilities. The disaggregated analysis of accessibility to these facilities suggests that the average travel times faced by the poor – at least assuming that public transport is used – are nearly the same as for the city's overall population, with only a minute of difference in the case of any advanced healthcare facility or even specifically a public one. Also facilities offering advanced maternal care appear to be nearly equally well accessible for the city's poor. These findings are quite intuitive given the spatial distribution of poverty incidence, which appears to be relatively high in the more central parts of Kampala – areas that also have relatively high density of healthcare facilities. At the same time, when comparing to the other cities, these findings should be viewed in the context of the more limited definition of Kampala's extent compared to the other cities, whereby the outer areas of the true "functional city" are not covered in the analysis but almost surely have high poverty pockets as well as lower density of healthcare facilities.

A poverty map for Kigali had previously been prepared with World Bank assistance based on the 2013/14 Household Budget Survey. Poverty in Kigali has a distinct spatial pattern, with the central areas significantly lower poverty incidence – up to 10% in most neighborhoods – compared to the outlying areas, where in many neighborhoods upwards of 55% of the people are considered poor. However, given the higher population densities in central areas, poverty density per land area is highest in the center.

Kigali's poor population is estimated to face a pay a larger penalty in travel times to advanced healthcare facilities than schools, like in the other cities, with the difference between the poor and the overall population at 10 minutes by public transport in the case of

Figure 31: Poverty headcount in Kigali (%)

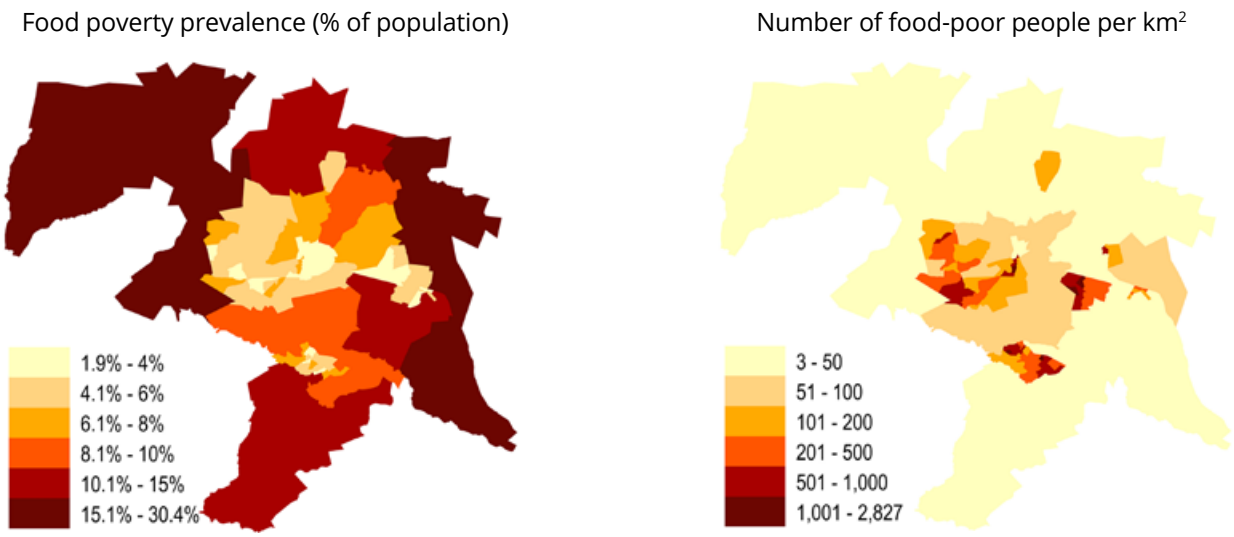


Source: World Bank (2019)

advanced healthcare facilities and 14 minutes in the case of hospitals specifically. However, the poor also have to travel longer to reach schools: 9 minutes longer and 7 minutes longer, respectively, in the case of primary schools and secondary schools.

In Harare, poverty analysis was undertaken in 2018 by the World Bank's Poverty Global Practice, based on the 2012 Census. The pattern is roughly similar to those found in many other cities, with the central area less poor in percentage terms but with individual high absolute poor-density neighborhoods as well. Southern- and easternmost Harare, however, stands out as having high poverty according to both metrics.

Figure 32: Poverty distribution in Harare and its suburbs, 2012



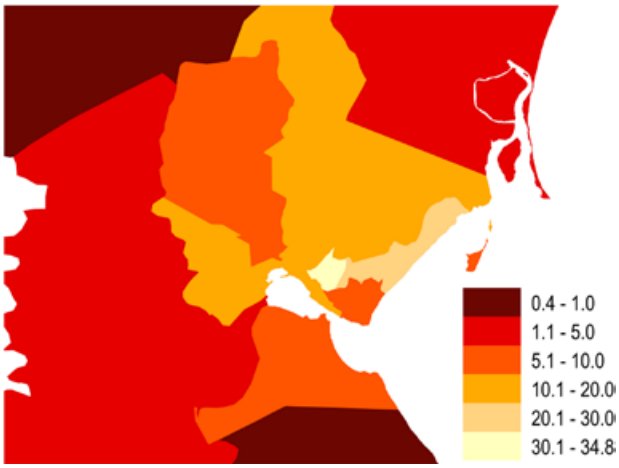
Source: World Bank Poverty Global Practice, based on 2012 Zimbabwe Population Census

The disaggregated accessibility analysis for the city's poor population suggests that, in light of the city's already relatively low accessibility, especially to advanced healthcare facilities, the poor do not appear to be particularly penalized – the average travel time to the nearest facility offering advanced care is 38 minutes by public transport for the poor compared to 35 for the overall population. The difference in average travel time is also about 3 minutes for traveling to the nearest primary school or the nearest secondary school of any kind; unfortunately, for Harare the public-private breakdown of facilities was not available. Despite the small differences in travel time by public transport between the poor and the overall population, it is important to note that the poor in reality are more dependent public transport – and non-motorized modes – than are the better-off.

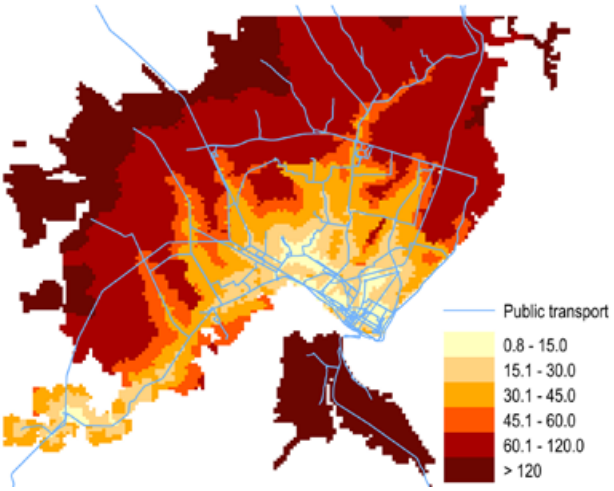
In Maputo, approximately 70% of the urban population still live in informal settlements with insufficient services, while over 50% live below the poverty line; the low level of investment in urban areas over many years has reduced the quality and quantity of service delivery (World Bank, 2011). The latest poverty map for the Greater Maputo Area (GMA) is available World Bank (2017) which conducted an in-depth poverty and vulnerability analysis based on the 2007 Census and 2008-09 household welfare surveys. It found that poverty significantly declined in most neighborhoods in GMA from 1997 to 2007, and there is a strong correlation between poverty reduction and access to basic services. Nonetheless, most of the population in GMA continue to live in underserved neighborhoods, with only basic infrastructure, unpaved roads, lack of piped sanitation, and most housing built of nondurable material. A comparison of the poverty map with more recent proxies such as nighttime light intensity in 2018 suggests that the two are consistent even if the 2007 Census based poverty map may not be reflective of more recent and temporary income shocks.

Figure 33: Poverty distribution vs. travel time by public transport to nearest public hospital in Maputo

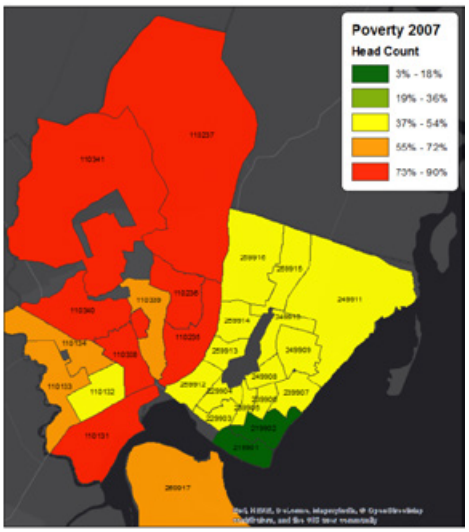
Nighttime light intensity (higher=more activity)



Travel time to nearest public hospital



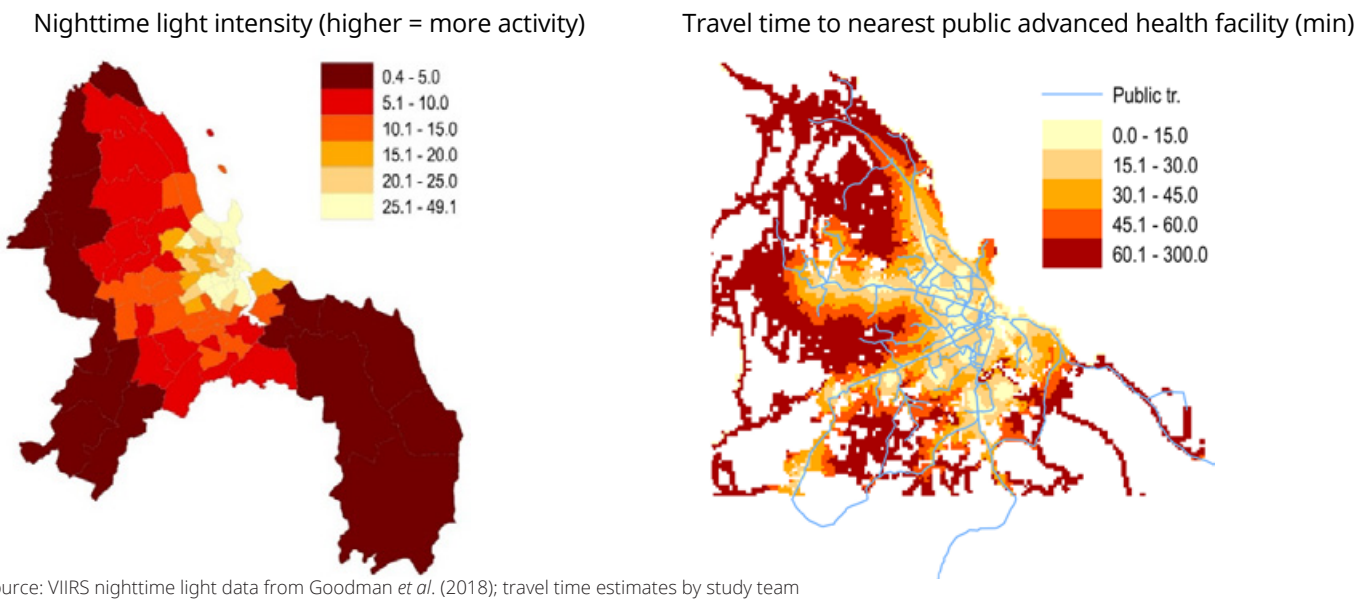
Poverty incidence in Greater Maputo Area



Source: VIIRS nighttime light data from Goodman et al. (2018); poverty headcount estimates by World Bank (2017) based on 2007 Census; travel time estimates by study team

A visual comparison of the poverty map and the accessibility estimates suggests that accessibility to advanced healthcare facilities, especially at the hospital level, is lower than average in large parts of mainland GMA to the West and Northwest of the downtown – especially central Matola City, where upwards of three-quarters of the population are poor. It is interesting to note that this area not only has higher-than-average poverty incidence but also saw a poverty rate *increase between* 1997 and 2007 according to World Bank (2017), by up to 7%, in contrast to the most accessible parts of GMA where poverty rate declined by over 80%.

Figure 34: Nighttime light intensity vs. travel time by public transport to nearest public adv. health facility in Dar es Salaam



Source: VIIRS nighttime light data from Goodman *et al*. (2018); travel time estimates by study team

In the peninsula south of downtown Maputo, which was not covered in the 2017 World Bank poverty mapping but where economic activity is low according to nighttime lights data, accessibility is estimated to be very low to key services that are more applicable to the poor households, such as public hospitals. As shown in the maps below, travel times by public transport to nearest public hospital in this area exceeds two hours. However, it should be noted that the recent construction of a bridge connecting the peninsula to the central downtown is not reflected in the available public transport data but is believed to have improved the opportunities for the peninsula's residents to access key services.

Tanzania's poverty incidence[93] in 2018 was estimated at 26.4%, down from 34.4% in 2007; in the Dar es Salaam region it was significantly lower, at 8%, which is about half of the average for the country's urban areas overall (United Republic of Tanzania, 2019). Forty percent of children in urban Tanzania live in multi-dimensional poverty.[94] Dar es Salaam's poor population in absolute terms in 2018 was estimated at just over 410,000. However, detailed poverty maps for the city specifically are not available. For the purposes of the current study, the Tanzania Population and Housing Census 2012 ward-level data was used to construct an asset ownership index, combined with information on whether the household head has primary education. These are considered to be reliable variables to provide an inference on the relative poverty distribution in the city, although the asset-based (non-monetary) poverty measure does not capture the effect of recent shocks. An alternative measure of economic wellbeing – the intensity of nighttime lights in 2018 – proved to be spatially closely correlated with the asset ownership based measure, with most wealth concentrated in the central downtown wards.

93 The basic needs poverty line for Tanzania Mainland for 2017/18 was defined at 49,320 Tanzanian Shillings per adult equivalent per month (~US$21).

94 Child Poverty in Tanzania report, 2016

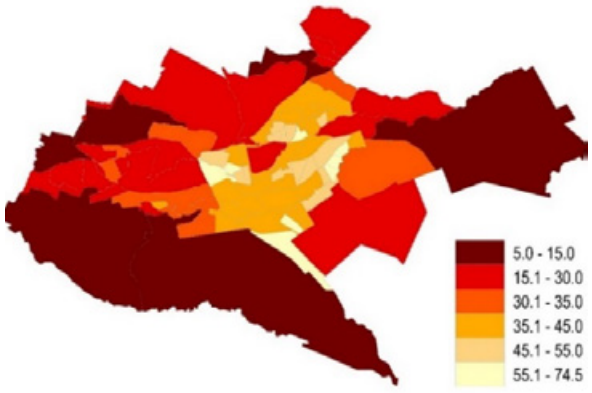
While quantitative accessibility indicators for Dar es Salaam's poor population specifically could not be estimated, the visual comparison of the spatial distribution of proxies of income/wealth and the accessibility indicators for the city overall suggest that physical accessibility – at least to advanced medical care – is lower in the poorer areas outside the city center and further away from the coast. For example, in large parts of the city where nighttime light intensity is the lowest, average travel times to the nearest public advanced healthcare facility exceed an hour, compared to about 35 minutes for the city's population overall. The travel time penalty faced by the poor to travel to schools – if there is one at all – is likely lower, given that, unlike advanced healthcare facilities, schools at least at the primary level in most cities tend to be distributed much more proportionately to population, with at least one available in each neighborhood.

Nairobi's central business district (CBD) has good accessibility and presence of services, and middle-income residents tend to live close by the CBD. However, there are clusters of poverty around the CBD, like Kibera, which is only about 6 km from the CBD; overall, more than half of Nairobi's residents live in informal settlements, suggesting the trade-off people prefer to make in favor of more convenient access to opportunities at the expense of housing quality.

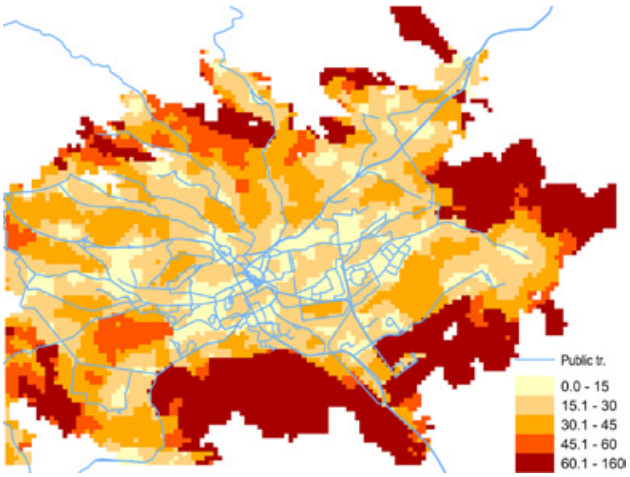
Extensive surveys conducted by Salon & Gulyani (2019) across 15 Kenyan cities found that 92% of household have a matatu service near their home, while in Nairobi the figure reaches 98%. However, the physical availability of matatus doesn't always translate into use. In Nairobi and Mombasa, only approximately 60% of households report using matatus, which the authors suggest may point to an affordability problem, poor destination coverage, or low service frequency. As had been found by the earlier surveys by the Africa Centre of Excellence for Studies in Public and Non-Motorised Transport survey (ACET, 2010), among Nairobi's slum dwellers, even when controlling for factors, such as childcare responsibilities and education level, women were less likely to commute using motorized transport than men.

Figure 35: Poverty proxies vs. travel time by public transport to nearest public advanced health facility in Nairobi

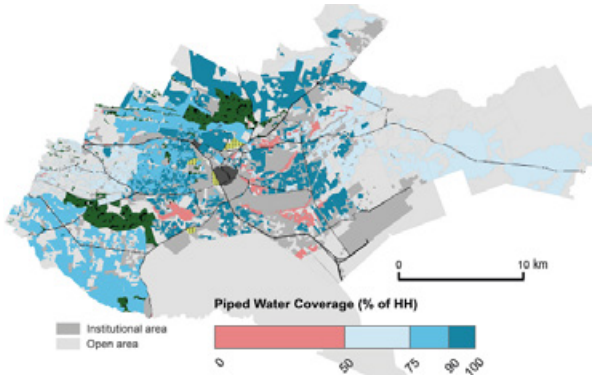
Nighttime light intensity (higher=more activity)



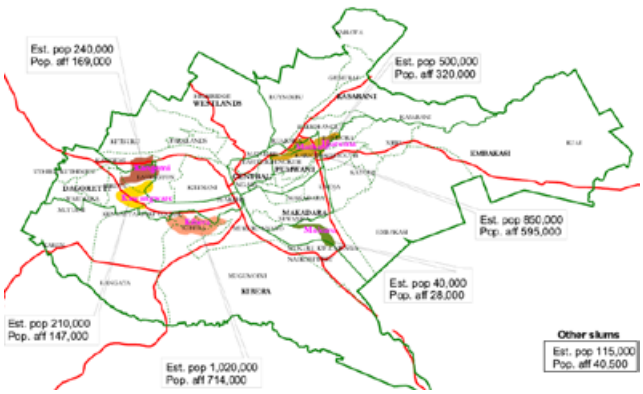
Travel time to nearest public advanced health facility (min)



Piped water coverage (% of households)



Slum locations



Source: VIIRS nighttime lights data from Goodman et al. (2018); piped water coverage mapping by Ledant (2013); Nairobi slums mapping by World Food Programme/VAM Kenya; travel time estimates by study team

The visual comparison of Nairobi's nighttime light intensity distribution and accessibility estimates to advanced care facilities suggests similar conclusions as in Dar es Salaam – the city's CBD, which corresponds to high nighttime light intensity and thus, likely, lower poverty incidence, has average travel times of less than 15 minutes to any of the facility types considered, compared to travel times exceeding 45 minutes or an hour in the outer areas.

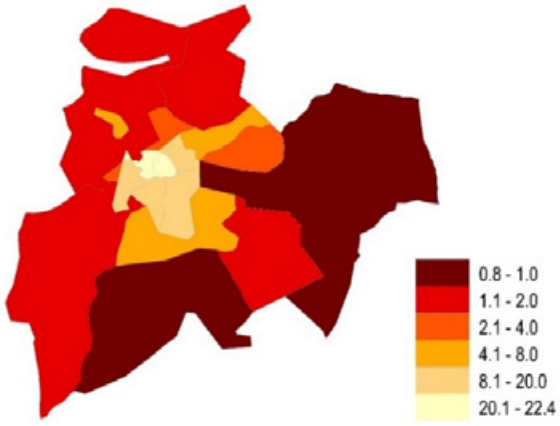
However, whether or not the average poor resident of Nairobi faces a travel time penalty to a specific type of facility is not as easy to conclude in the absence of a robust poverty estimate; unlike in Dar es Salaam, densely populated slums, some of them (Mathare, Huruma, Kibera) estimated to provide shelter to over half a million people each, are located in central Nairobi where accessibility to key services is good. Another proxy for the presence of lower income populations – similarly suggesting that many of Nairobi's poor live in centrally located and accessible areas – is the proportion of households enjoying piped water access; this figure dips below 50% in the parts of town characterized as slums. As noted before, this type of residential sorting is intuitive and suggests an intentional trade-off made by households in favor of accessibility – not just to schools and healthcare facilities but also livelihood opportunities – at the expense of housing quality.

Spatial correlations between accessibility and nighttime lights intensity as a proxy for the residential location of lower-income households are quite distinct in the final two cities: Bamako[95] and Conakry. These are due not only to the reach of the public transport systems but also due to the spatial distribution of health and education facilities; for example, due to the sparser availability of schools in Bamako's suburbs, which correspond to areas with much lower economic activity and, likely, household incomes, also walking-based accessibility in these areas is lower. Similarly, in Conakry, the combination of low public transport network coverage and lack of locally present advanced healthcare facilities in the city's lower economic activity neighborhoods results in those neighborhoods having significantly inferior accessibility than in downtown Conakry, with travel times by minibus exceeding an hour. People living in the lower-income neighborhoods in the city's North and East are not only less able to access health and education *facilities* but also face other spatially distinct disadvantages, such as significantly higher student-teacher ratios in schools, which impacts the quality of the service received even once it is accessed.

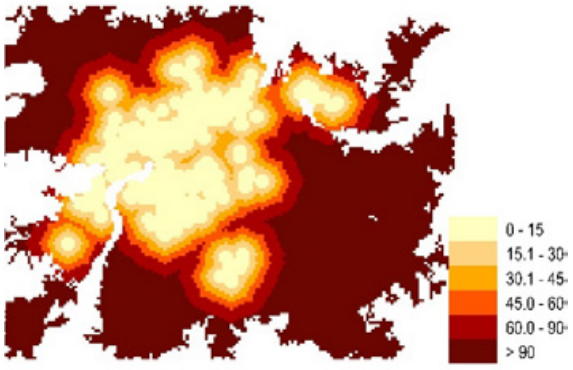
95 The poverty assessment by the World Bank (2020) suggests that the poverty rate in Bamako declined from 10.7% in 2011-12 to 3.8 percent in 2019/20; however, the assessment did not generate detailed enough indicators to allow understanding poverty distribution within the city.

Figure 36: Accessibility and resource availability disadvantages in the lower-income neighborhoods of Bamako and Conakry

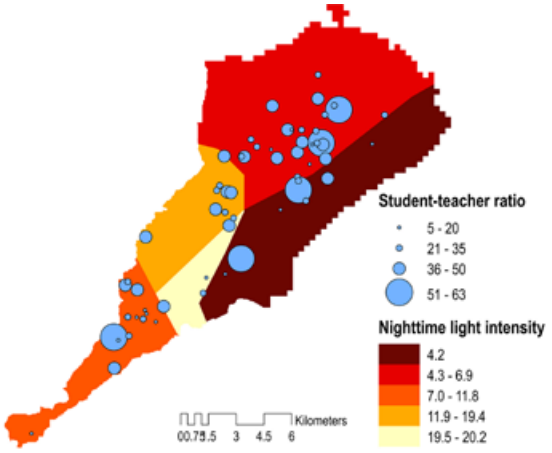
Nighttime light intensity in Bamako (higher=more activity)



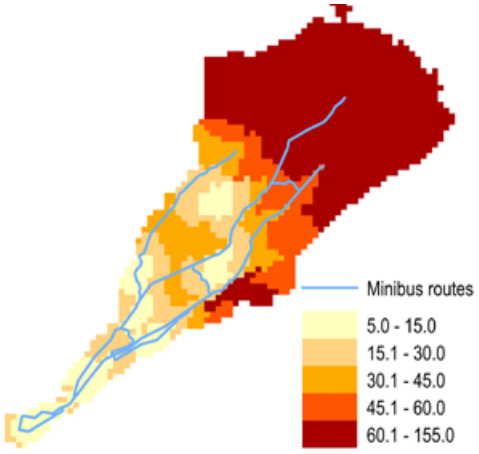
Walk time to nearest primary school in Bamako (min)



Nighttime light intensity and secondary schools, by student-teacher ratio, in Conakry



Travel time by public transport to nearest public advanced healthcare facility in Conakry (min)



Source: Conakry schools data from Ministry of Education's Office for Strategy and Development; nighttime lights data from Goodman et al. (2018); travel time estimates by study team

Insights on the spatial patterns of low accessibility to services in relation to poverty were also provided by several of the human rights organization staff that we interviewed as part of this study. They pointed to the relatively common pattern where population living in peripheries and informal settlements (new and old) often have to travel many kilometers to access medical treatment. In Zimbabwe, for example, private health service providers and pharmacies reportedly strategically position themselves "where the money is"; thus, they are lacking in the poor communities.

Spatial inequality is also apparent in the quality of care, with the poor communities clearly at a disadvantage: even though physical structures may be relatively well distributed within the city in some countries, the units in the periphery are of lower quality. In Zimbabwe, while people living in the most densely populated areas have access to clinics, their treatment or medication may not be available, as some treatments are only offered in large clinics that are much more sparsely distributed. The smaller clinics where one can obtain more basic treatments tend to be distributed throughout the cities;

however, the largest health centers are located in the city centers (e.g., mentioned in interviews specific to Rwanda and Senegal). Because of the spatially uneven quality and the range of services and medication available, one needs to travel for quality or higher complexity treatments.

In face of the physical accessibility challenges to healthcare facilities, community health volunteers were noted to play a major role in helping people from informal settlements access to health information and treatments in Kenya, Rwanda and Ethiopia, is in part because they can easily reach the community. In Rwanda, community health workers are considered essential in ensuring access to prenatal care and to healthcare for people with disabilities as they actively search for patients and bring the services to them.

> **"So education is free and the two years of basic education are compulsory but they are associated costs that make some people not being able to afford, and you would be surprised in Kigali, especially in Gasawo district, because of the landscape or geographical setup, I don't know how to call that, there are localities where children need to travel two hours by feet before reaching a primary school, so because of those circumstances, there are a lot of dropouts and they are still in Kigali."**
>
> — Rwanda

Similarly to healthcare, access to education is not seen as equal by the interviewed human rights experts, with inequalities arising in the available infrastructure and resources. In the case of Kenya, Zimbabwe, and Senegal, public education was noted to be of inferior quality and with worse infrastructure; in Zimbabwe, education quality was also noted to have a spatial pattern, declining as one moves away from the more densely populated areas.

As in the case of healthcare, affordability of education – as well as the choice of which school to attend – is reported to be very much linked to transport (or lack thereof) and is further worsened by geographic location. Walking – sometimes over an hour – is commonly the only option for accessing school for children living in informal settlements (e.g., noted in the case of Ethiopia), as no school buses come to these informal settings. Some schools are present locally within informal settlements, as was mentioned in the case of Ethiopia, but may still be inaccessible for the families living there due to high cost. Schools in the poorer neighborhoods are also reportedly more likely to have overcrowding, as was noted in the case of Kigali, which may necessitate traveling long distances to schools further away.

Spatial inequality in transport access that affects access to school in the poorer neighborhoods is reportedly compounded by transport safety issues which further impede children's access to education. There is no public transportation that goes to informal settlements, and even where public transportation is available, it is dangerous for a child – especially if the child is a girl – to travel alone.

"Again, in Kigali, as P1 said, there is high density of children in one classroom, which may push some from this area to skip school that's nearby and go further schools which may require them to take a bus or any other means of transportation, and if they can't afford, then children from poor family may either drop or take these long distances every day and they may also delay to school and that affects their education."

— Rwanda

"I can afford a bus or transport for my kid in school. Let's say a 9-year-old, because I am working, I will be taking this girl to school, she will be expected to go and get public transport on herself, and in these places, some of our transport is super packed, it is super busy and it is full of adults and the use of them, in navigation is extremely dangerous for a child: I am talking about pedestrian behavior, issues of sexual harassment for girls or grown women, let alone children and for them to come back home [breaking] so even though they are accessible, whether you are able to use it, they are not safe places for young children to be, so sometimes parents will keep their children at home."

— Ethiopia

Photo credits: Dominic Chavez

7. Policy Implications

Photo credits: Dominic Chavez

Urban transport availability and the accessibility it ensures between homes and education and healthcare facilities matter for the ability of people to realize their Rights to Education and Health. If children cannot get so schools, their ability to keep up with learning will be severely limited. And, if pregnant women cannot reach maternal health facilities or if parents do not have transport options available to bring their children to clinics, maternal and infant health will inevitably suffer. However, the strive to ensure that the Rights to Education and Health are fulfilled equitably by all members of the society, transport affordability and appropriateness – such as for the poor, the disabled, the elderly, and the otherwise marginalized – need to be equally central policy objectives.

As suggested by the analysis presented in this study, health and education accessibility inequities across space and through the exclusion of specific socio-economic groups continue to persist in African cities. **In most cities, at least one in ten residents faces a one-way travel time to the nearest advanced healthcare facility of over half an hour by public transport** – assuming they can afford the trip in the first place and do no have a disability that would prevent them from boarding the vehicle. In four of the cities, travel times of over an hour in public transport, indicative of true "accessibility poverty," are faced by at least 5 percent of the population – these are often residents of outlying, poor settlements that also lack any private mobility options.

Public transport based travel times to nearest primary and secondary schools tend to be lower than to advanced healthcare facilities, and fewer people are completely cut off from any opportunities. Nevertheless, given that the trip to school must be made every day, one-way travel times by public transport exceeding half an hour – which is the case for at least a few percent of the urban residents in all of the cities but one – are scarcely a sign of adequate access. Another finding from the analysis is that public transport in most of the cities does not appear to provide a large accessibility benefit above and beyond traveling on foot, and average accessibility to schools does not seem to be higher in cities where a larger share of people living directly near public transport (i.e., more transit-oriented cities). This latter observation might indicate that the public transport operators, some of them informal and already scrambling to break even, do not prioritize routes to schools; that the technical characteristics of public transport services (speed, headway) are so poor that the value of being near a service is significantly diminished; or that the sprawling nature of some cities make travel distances long regardless.

In comparison, higher residential proximity to transit appears to translate more directly into better accessibility to advanced healthcare facilities, although it is nevertheless less predictive compared to the local presence of the facilities directly within residential neighborhoods or the average population size per facility. The greater correlation between residential proximity to transit and accessibility to advanced healthcare facilities – compared to accessibility to schools – might be due to these facilities being more commonly located in economic activity centers well served by public transport; the relative scarcity of these facilities compared to schools also means that one has to travel by a motorized mode to reach them, as many people do not have a facility within their neighborhood.

While some accessibility challenges persist across all ten cities, different approaches in prioritizing policy interventions are likely needed depending on the specific accessibility landscape. The first group of cities includes those – such as Douala, Conakry, Nairobi, Kampala, and Kigali – where average accessibility to not

only schools but also advanced healthcare facilities is relatively good, but where there are individual accessibility poverty pockets or evidence that socio-economic groups are not able to afford transport services. In these cities, policy interventions should be more specifically targeted to those spatial areas or groups of people, such as through: limited spatial reforms and investments in transport system coverage; investing in data and analytics to understand why existing transport operators do not serve these locations if they're potentially high demand (due to low incomes of users? lack of access roads? absence or irregularity of work commute trips?); and providing targeted incentives, such as a short-term franchise subsidy or cross-incentive for transport operators or health/education facility operators to expand their services to these areas. In the second group of cities – such as Harare, Ouagadougou, Bamako, and perhaps Dar es Salaam – also *average* travel times to the nearest advanced healthcare facility are high, even if accessibility to schools is significantly better (except in Harare). In these cities, there might be a need for a more general overhaul or large-scale investment in additional high-capacity transport corridors and public transport solutions as well as additional health infrastructure.

For both sets of cities, possible policy interventions can be aligned along the feasibility-versus-impact axes, with some easier to implement actions and some others that would require overcoming significant coordination challenges but would ensure a more transformational impact in the long run.

Lower-hanging fruit

Data collection to track accessibility gaps for different groups: The use of spatial tools to measure transport disadvantage in different areas around a city is by definition at the aggregate geographic level; they do not measure the impacts on *individuals* living in these locations (Delbosc & Currie, 2011a). The interviews conducted as part of this study therefore provide crucial complementary evidence on the accessibility disadvantages faced by specific marginalized groups in the cities in scope of the analysis, such as women (in particular, elderly and low-income women) and the disabled, for whom travel in public transport may be unaffordable if a guide needs to be hired to accompany them to a healthcare facility.

Quantifying to what extent a specific person or family suffers from public transport deficiencies is difficult because transport poverty manifests itself at the individual and household level, while appropriate data are generally only available at an aggregate scale. The setting of an "access poverty" line is both a political issue (what differences in access levels are deemed acceptable?), and an empirical issue (what differences in access levels are correlated with significant differences in levels of activity participation and well-being?). It is beyond the scope of this paper to address these issues. Similarly, more advanced accessibility measures could be employed, such as measures which account for competition between populations seeking to access the same destinations (Golub & Martens, 2014). The

relevance and importance of this latter issue in the African city context came through clearly in the interviews with the human rights practitioners working on the ground. Namely, even in cities where accessibility to the *nearest* healthcare facility or school is acceptable, the ability to access care in reality may be limited, as facilities in higher density locations and on city peripheries are reported to be overcrowded.

Therefore, among the first priorities for any city willing to improve accessibility for all is the investment in good data. Specifically, gender-, income- and otherwise disaggregated data, collected regularly over time, is needed to track accessibility, affordability, and appropriateness constraints faced by city residents to inform policy, planning, budgeting, and implementation. The data collection would allow grounding the existing access voids in local reality, allowing to identify interventions that would allow a city to quickly and affordably improve accessibility for specific groups of people – for example, through the implementation of new transit routes, adding missing links in the road network or pedestrian infrastructure, prioritization of new facility locations – and also providing evidence on potential bigger issues that limit accessibility, such as a profound spatial mismatch. Adequate data can also help transport planners understand the role and value of transport investment *relative to other* policy measures in solving the problems of areas with high levels of poverty and social exclusion. For example, marginal improvements to already high levels of physical accessibility may make little difference to residents whose principal barriers to movement may be related to cost.

Lastly, comprehensive and consistent data collection efforts would also enable cross-neighborhood and cross-city comparisons and allow for more direct benchmarking, similarly to how this is already done by Demographic and Household Surveys that are implemented in nearly every country albeit with only limited frequency and without statistically representative samples at the sub-city level.

Improving the process of decision-making in the transport sector: Given the significant resources involved and the lasting effect that transport infrastructure investment has on regional and urban development, the decisions concerning which infrastructure and where to construct it needs to be carefully considered (ITF, 2019), and input from the users should serve as a key input into this decision-making. Governance issues need to be addressed, even if in an incremental way, to improve the accountability of transport planning and health and education sector institutions and their feedback look with city residents, including through more meaningful, bottom-up participation of vulnerable groups in the planning process. A human rights based approach to infrastructure and services planning, applying in practice the principles of participation, transparency, accountability, and non-discrimination, would help policy makers to reach the most vulnerable groups and identify interventions that would make the biggest immediate impact. The transport system planning process in particular should include not only the city residents but also the transport workers to bring them into the same room and allow more clearly communicating the residents' expectations and needs vis-à-vis the transit providers, the transit providers' ability to fulfill those needs, and the actions from planners/cities that can bridge the gap. For example, the city may be able to provide incentives to transport service providers to ensure that transit services are not limited only to the routes with the high and predictable ridership but also serves the lower frequency and more variable destinations, such as hospitals, especially from residential neighborhoods that are inhabited by transit-dependent populations.

Improving transport infrastructure and services: Transport infrastructure improvements tend to be costly, with the price tag for even a single Bus Rapid Transit route typically well exceeding US$100 million in the African city context. However, targeted improvements in the transport infrastructure and services in the ten cities covered in this study arguably represent a relatively low hanging fruit – from the feasibility of implementation perspective – that would allow making a significant dent in accessibility poverty. In addition to high-capacity transport corridors, however, investments in improving the non-motorized and, especially, pedestrian infrastructure could help improve access for many, especially for reaching schools which are known to be relatively more widely available. Previous studies in African cities have recommended not only extending and improving the efficiency of the mostly dilapidated public transport networks but also separating spaces for cyclists and pedestrians, integrating NMT within the rest of the transport system, and implementing traffic calming measures within the boundaries of nurseries and schools. Given the overwhelming dependence on walking to primary schools in African cities, as evidenced in the interview and survey data presented in this study, policy makers should focus on improving the walking experience, ensuring that these trips are safe, and providing appropriate infrastructure for people with disabilities.

Across the analyzed cities, accessibility to higher level of service, such as those available in only in hospitals, is consistently worse than accessibility to services that are used regularly and by a predictable share of the population, which is economically rational from the perspective of the public transport providers. Since there is prevalence of informal public transport forms in the analyzed cities, there is potential for utilizing emerging technologies to develop on-demand services to less frequent but essential/critical trips; for example, the implementation of a network of privately operated "ambulance taxis" could be supported by the city governments to improve maternal health outcomes for the women living in accessibility-poor neighborhoods. A similar system was already launched in rural Tanzania with external donor help in 2016 and since then has had a significant impact on reducing maternal mortality.

In many world cities, those whose school access needs cannot be economically served by profit-seeking transport operators have been reached through government supported dedicated transport (school buses), which is not the case in the cities analyzed in this report and could be a solution for connecting the children living beyond reasonable walking distance. In some of the cities, indeed, on-demand services, in the form of taxis and moto-taxis, have become the de facto solution but these are not affordable to everyone. Therefore, targeted financial support, such as in the form of vouchers for private taxis, would be needed to improve accessibility for some groups, underlying the reality that even just transport connectivity needs to go beyond physical distance and also consider other travel-related costs in terms of money, time, and personal safety. Similarly, the city governments could introduce new geographical zones of public transport service by incentivizing or subsidizing operations there in some small, immediate ways (e.g., through a simple 1 or 2 ticket price operating subsidy per-vehicle that arrives at an underserved school or hospital), without pushing for more fundamental transport sector reforms (in the short term).

Longer-term actions

Improved institutional coordination: Proximity of public transport to people's homes matters, especially so for accessing advanced healthcare facilities and among transit-dependent populations. Similarly, the residential proximity to schools is important for ensuring access, given the dependence of many children on walking. Thus, the coordination of transport, housing, and health education sector planning and investment is fundamentally important for achieving good, equitable access to education and health. Transit-oriented development, channeling new population growth in transit-accessible areas, and urban planning policies that ensure that health and education centers are accessible to transit and to residential communities are key ingredients for closing accessibility gaps over the longer term. For example, the urban policy-makers' attempts to support the poor by providing decent urban housing need to be mindful of the spatial distribution of schools and healthcare facilities – i.e. ensuring land use that is mixed – rather than placing housing in distant areas that would require the poor to travel long distances to access services in a context of already high congestion and lack of coverage of public transportation.

The coordination of transport and land use planning at the metropolitan scale can also help limit the sprawl of haphazard, disconnected development that has characterized many African cities over the last decade (see Lall *et al*., 2017) and that makes the provision of efficient transport services unaffordable. Overall, cities need to address their fundamental structure and more strategically plan ahead where new facilities should be located or existing ones enhanced to service more people; to do so, it is important that land is preserved for these purposes well in advance.

Public transport reforms: Some of the interventions with the potentially highest payoff inevitable require overcoming significant political economy issues. These interventions include, above all, improved regulation or even reorganization of transport service provision, much of which in many African cities is currently informal and highly fragmented, with many operators barely breaking even, which encourages the clear prioritization of only highest ridership destinations. Similarly, while to date a lot of the discussion of formalization or reform of transport in cities has centered on safety, emissions, congestion, and similar aspects while taking the existing networks as sort of axiomatic, the spatial analysis presented in this study suggests that the transport route geographies in some cities have significant shortcomings from the perspective of ensuring adequate access and mobility.

Addressing the supply side: Transport sector interventions can address only a sub-set of the issues that in practice limit access to schooling and healthcare for all. The other fundamentals that have to be worked on over time are those on the supply side of health and education sectors, above all, the quality of the services provided. The interviews conducted as part of the current study suggest the presence of a clear "dual system" in many cities, with the quality of services available in public schools and health facilities significantly compromised by insufficient resources and staffing. In this context, distance or transport connectivity is not always a good predictor of individuals' decisions to actually use the services available at a specific clinic or school; instead, the facility's reputation or perceived quality may matter equally or more. The dual quality of service provision must be tackled to ensure not only accessibility but also the quality is more equitably distributed.

Annexes 1 and 2 lay out a more detailed menu of policy recommendations that should be considered to improve accessibility in Bamako and Ouagadougou, two cities in scope of this study with some of the most challenging – albeit different – accessibility gaps.

8. Annexes

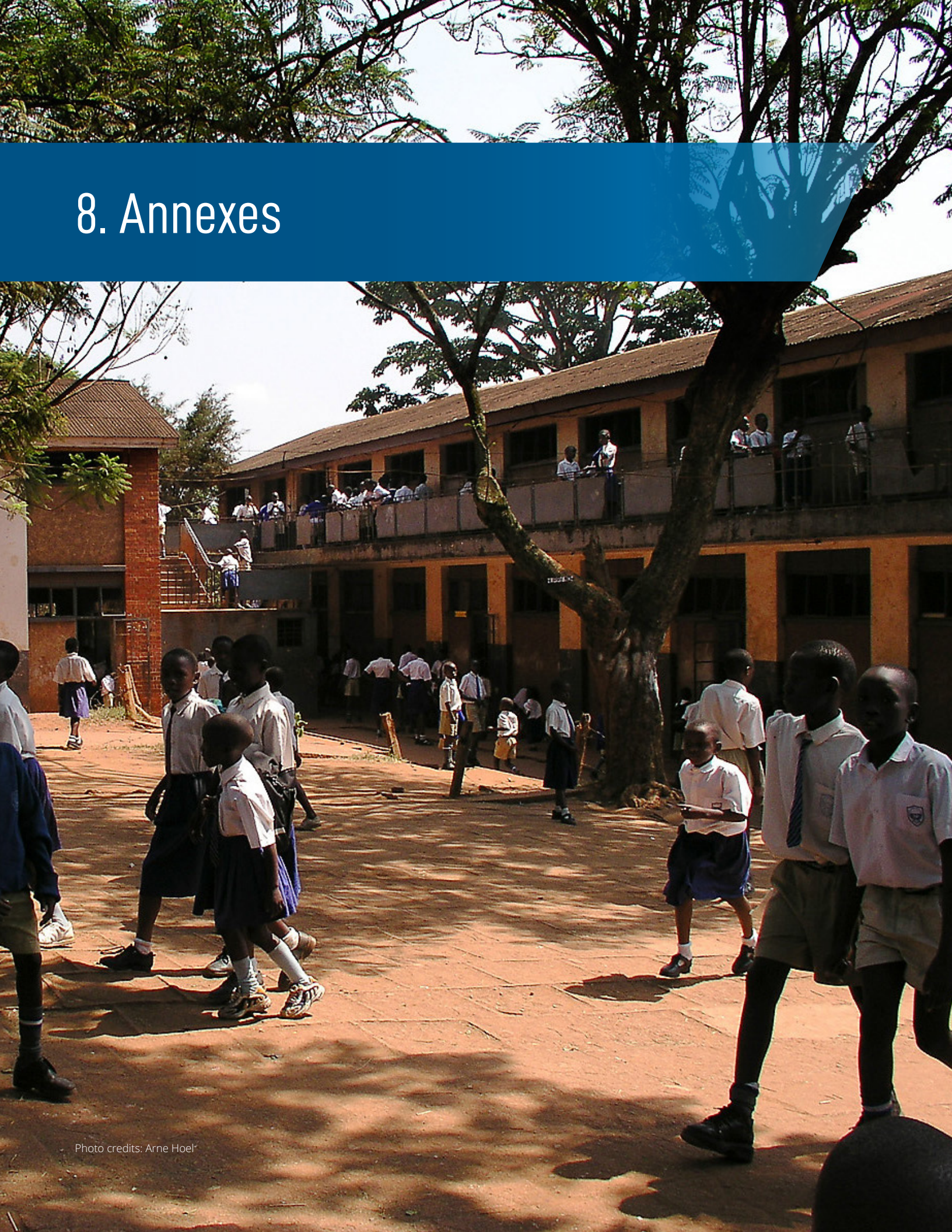


Photo credits: Arne Hoel

Annex 1: Accessibility analysis and recommendations for Bamako, Mali

1. Summary of findings: the categories and the spatial lenses

Access to education has played an important role in the poverty reduction in Mali over the last decade: in 2014-2018, improvements in education and access to basic services was estimated to have led to a 10 percentage point reduction in multidimensional poverty (World Bank, 2020). In Bamako, the poverty rate was estimated at 3.8% in 2019/20, down from 10.7% in 2011/12. Nevertheless, Mali remains one of the poorest countries in the world, and in 2020 had a Human Capital Index of only 0.32 (0.44 in Bamako), meaning that a child born today in Mali can expect to achieve roughly 32% of her productive potential. And, while children's educational outcomes improved in 2014-18, the health component of the multi-dimensional poverty index deteriorated; for example, the share of household with a member who fell sick or ill in the last 30 days but was unable to consult with a health specialist increased during the same period from 21.7% to 37.0%, including due to lack of infrastructure (World Bank, 2020).

A poverty map is not available for Bamako; thus, tracking the accessibility indicators specific to the poor residents was not possible. However, the Modular and Permanent Household Survey (EMOP) 2011-19 and the periodic Demographic and Health Survey allows to monitor progress in improving the living conditions of Bamako's households belonging to different socio-economic groups. For example, this data suggests that 30.9% of urban households are concerned about health expenditure, 27.1% about school supplies, and 25.9% about children's school fees. For accessing healthcare, distance to the facilities is mentioned as a major constraint by 17.4% of women aged 15-49 in Bamako, behind getting the money to pay for the services and getting the permission to seek treatment (Republique du Mali, 2019). In Mali overall, distance to school is named as a reason for never attending a formal school by about 10% of children and young adults aged 7-24, approximately the same among girls as among boys. However, among children ages 5–10, girls are less likely than boys to visit a clinic or other health facility when they experience an illness, possibly because boys' health is being prioritized (World Bank, 2020). Even if a health facility is accessible, the Harmonized Survey on Household Living Conditions (EHCVM) 2018-19 survey data suggests that the cost of health services causes many to forego treatment: about a quarter of households in the lowest wealth quintile do not seek help at a health facility at all when they are sick due to this reason.

In Bamako, walking is the mode of transport for more than half of all trips (SSATP, 2020b). Another 17% of the trips are made by bus, and 9% by car, although data is not available on the differences by gender. In major African cities, on average, buses and minibuses jointly account for about 20% of motorized trips, while motorcycles are used in about 15% of motorized trips. However, Bamako stands out as having an overwhelming dependence on motorcycle transport, representing more than half of all motorized trips, although the dataset underlying this figure is now over a decade old (see Kumar and Barrett, 2008).

The fixed-route public transport system in Bamako is entirely dominated by minibus transport (*Société des Transports du Mali*, SOTRAMA), consisting of about 200 routes. The system provides a relatively good coverage of the city's more populated areas. Approximately 92%

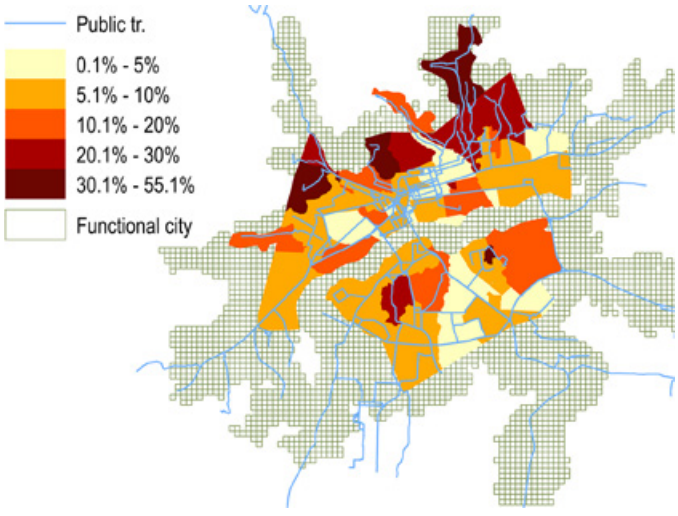
of the residents of the "functional city" – the city area as defined by actual employment and commuting patterns – live within walking distance to a route. However, the quality of the service is poor in terms of frequency, speed and comfort: there are no designated stops, and frequency of the service is unpredictable with often lengthy wait times (up to an hour for certain lines) (World Bank, 2019b).

In the "functional city" of Bamako, which spans an area of about 478 km^2, there are 72 CSCOM facilities, seven CSRef facilities, and eight hospitals. The spatial analysis suggests that, for the average resident of the "functional city" of Bamako, it takes about 18 minutes to reach the nearest facility (either CSCOM, CSRef or a hospital). However, the average travel time is considerably longer, about 32 minutes by public transport, to reach specifically the facilities providing relatively more advanced care – hospitals and CSRef – and over 40 minutes are needed to reach a hospital. Accessibility to hospitals is particularly low in the south-western and north-eastern parts of Bamako, roughly corresponding to Communes I and V, where travel times exceed an hour but reach nearly three hours in the very outskirts. The high travel times to individual hospitals are at least partly due to them not being directly accessible from the SOTRAMA network: one of the eight hospitals (CHU Point G) is located further than a kilometer from the nearest route, while two others (Hôpital Gavardo and Hôpital du Mali) are almost a kilometer away.

A total of 547 primary schools and 317 secondary schools were located in the city; however, the public versus private status was not available for the schools located in Bamako's outskirts and therefore the accessibility analysis did not separately address public schools.

The average travel time, by public transport, to the nearest primary school and secondary school is estimated at about 13 minutes and 15 minutes, respectively, although exceeds half an hour in relatively large parts of the city's outskirts. The value-added provided by the SOTRAMA network for accessing primary schools is relatively marginal, as the average travel time to the nearest school on foot is only a couple of minutes higher (15 minutes). This is explained by the fact that about 76% of the city's population live in close proximity to a primary school, although this share is significantly lower than in Conakry, Douala, Nairobi, and Ouagadougou. Residential proximity to secondary schools – i.e., the presence of secondary schools locally in residential neighborhoods – is even lower, with only about 65% of Bamako's population living within a kilometer from a school, below any other city analyzed in this study except for Harare.

Figure 1.1: Share of housing that is informal



Source: Data from Geospatial Operations Support Team

The public transport network density and the availability of hospitals is higher in northern Bamako, which also corresponds to neighborhoods with a particularly high proportion of informal housing, exceeding 50% in some areas. It may indicate that poor households locate there not only because of more affordable (even if worse quality) housing but also because of better walkability to these key services and accessibility to employment opportunities that being near the SOTRAMA network and to the central business district helps ensure. The rise in informal housing subdivisions is likely to continue with the influx into Bamako of internally displaced persons (IDPs), although spatial data on their specific residential locations is not available.

About 10% of Bamako's population are characterized by "accessibility poverty" for accessing hospitals (over an hour of travel time by public transport), while 1% of the city's population cannot reach neither a hospital, nor a CSRef facility or CSCOM within this time threshold. The share of "accessibility poor" to primary schools – defined as those who face travel time in excess of half an hour one way by public transport – is 7%, slightly less than to secondary schools (8%). About 1-2% of the city's population cannot reach even a single primary or secondary school within a full hour of travel.

Figure 1.2: Inequality in accessibility: cumulative population share able to access the nearest facility by public transport

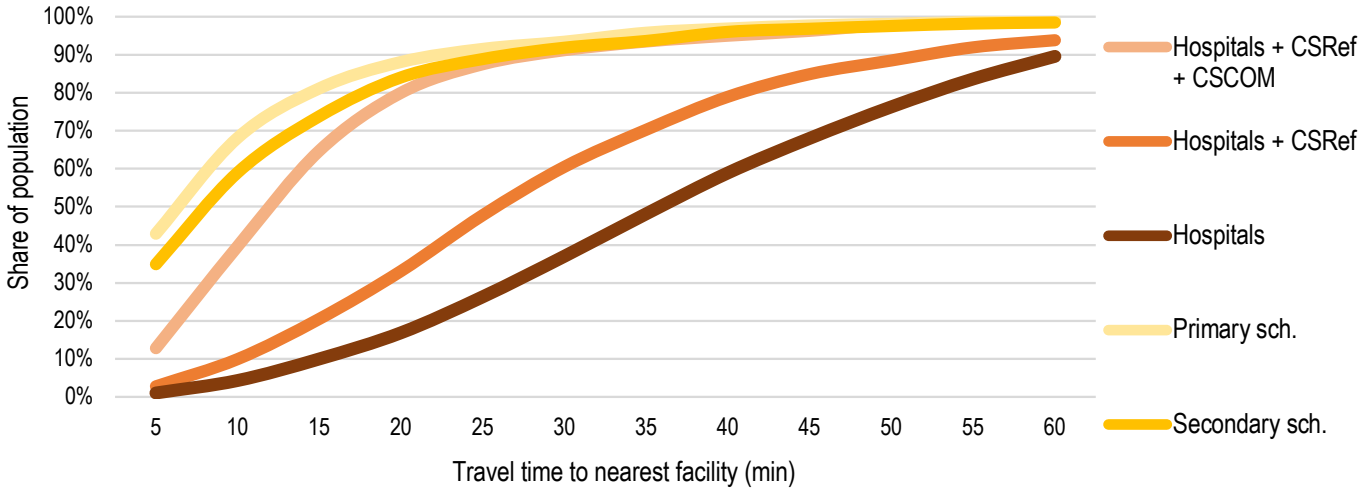
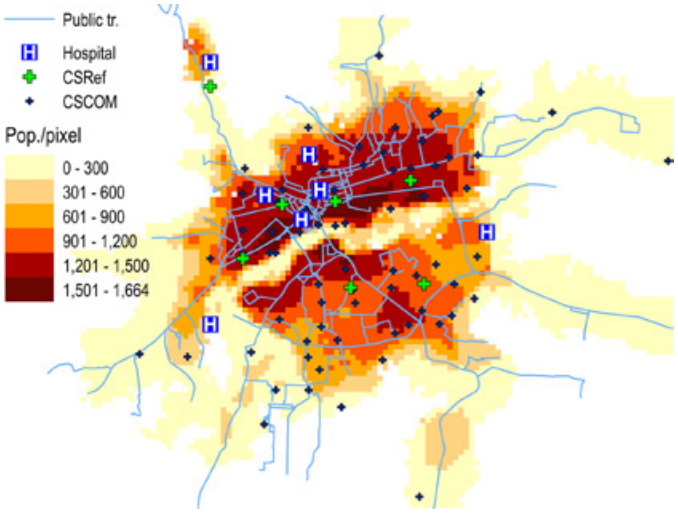
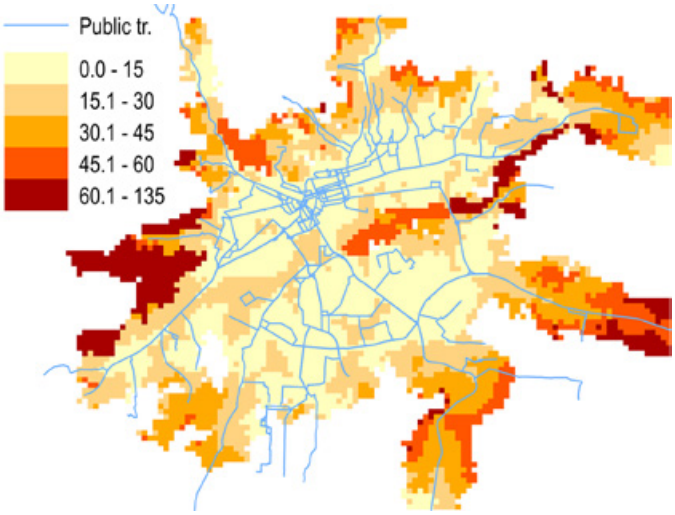


Figure 1.3: Locations and travel time by public transport to nearest facility

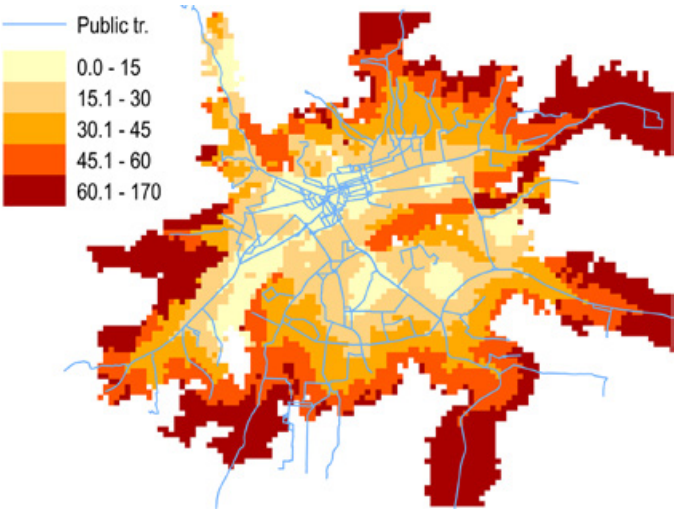
Locations of Hospitals, CSREF, and CSCOM



Travel time to the nearest Hospital, CSREF, or CSCOM



Travel time to the nearest Hospitals or CSREF



Travel time to the nearest Hospital

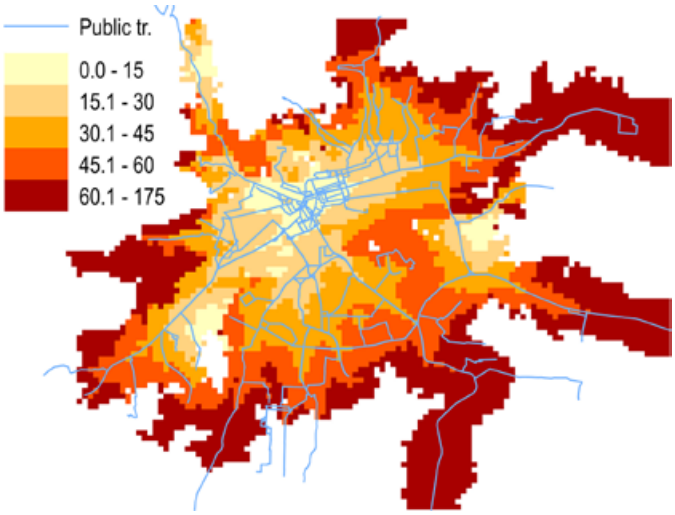
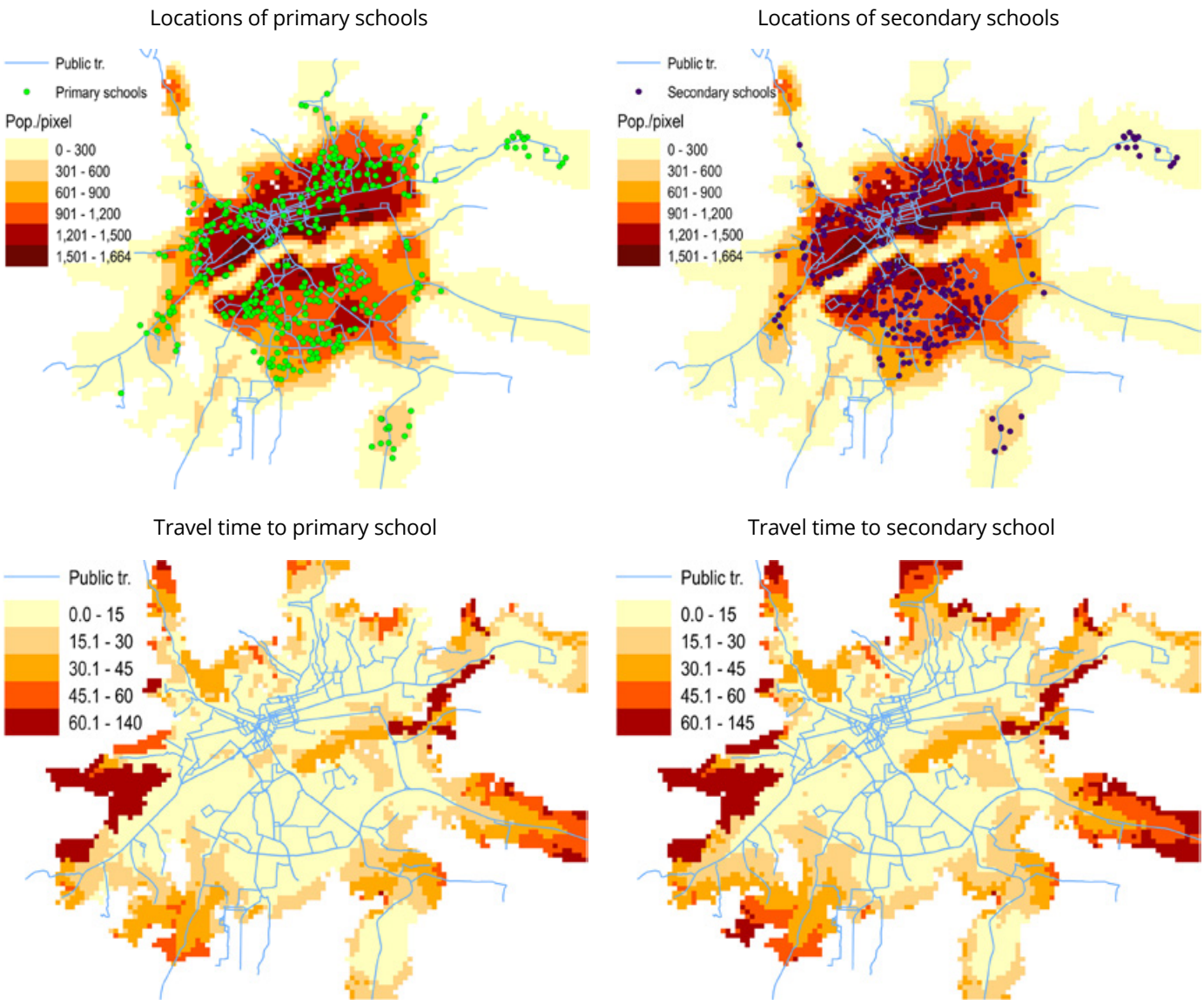


Figure 1.4: Locations and travel time by public transport to nearest primary and secondary school

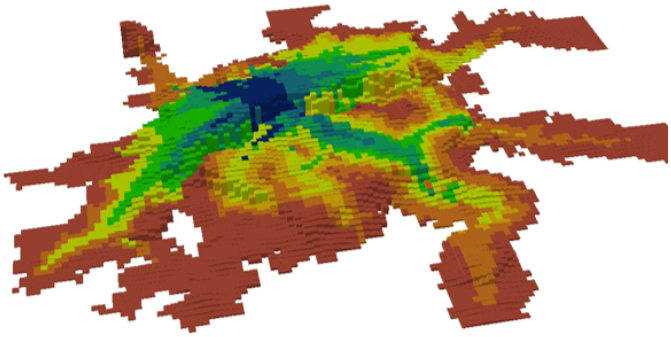


2. Explaining the findings

2.1. Transport efficiency

The identified accessibility patterns, especially to the much more sparsely distributed hospitals and CSRef facilities, are at least partly driven by the public transport route allocation across the city. Serving relatively low-frequency destinations such as hospitals may not be an economically rational choice for public transport providers, especially if these destinations do not overlap with high-frequency and predictable-demand destinations such as employment hubs. Based on the analysis conducted by Peralta-Quiros *et al*. (2019) using data from a business registry carried out in 2015, Bamako's employment opportunities are relatively tightly concentrated in central parts of the city, with opportunities in the outlying areas.

Figure 1.5: Bamako population (height) and accessibility to employment opportunities (color)

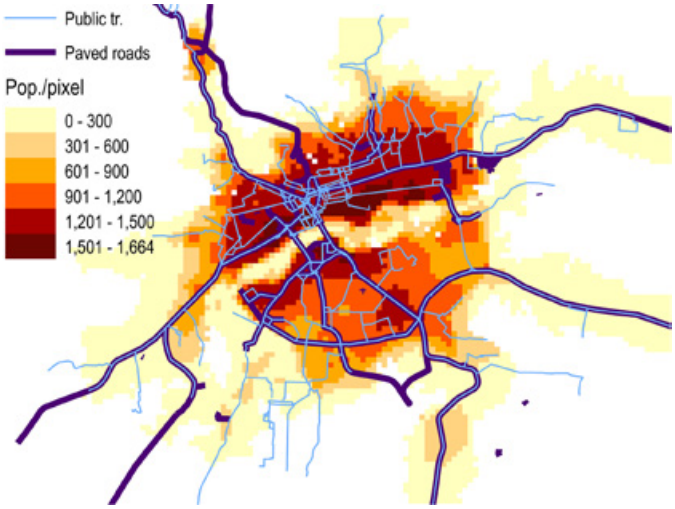


Source: Peralta-Quiros *et al*. (2019)

The areas with highest economic densities also correspond to the highest density of SOTRAMA routes, at more than 18 km per km2. In contrast, the routes are much sparser – at below 8 km per km2 - in neighborhoods with low employment density near two of the city's eight hospitals – Hôpital Gavardo, located on the northern bank of River Niger in the westernmost part of the city, and Hôpital du Mali on the southern bank of the river near the city's eastern boundary. The accessibility benefits – such as to hospitals – that are provided by the public transport network in Bamako are more noticeable than in the case of some of the other cities, with areas near the SOTRAMA routes estimated to have better accessibility than those not.

Despite the outward expansion of Bamako over the last decade, most of the administration, higher education buildings, and the main market have remined concentrated in Rive Gauche, which contributes significantly to increasing congestion. Congestion in Bamako is high also because of the natural bottlenecks created by the river Niger, owing to which only three bridges can channel the flow of commuters mainly coming from the Rive Droite of the river to the Rive Gauche in the morning. Finally, congestion is also magnified by the lack of ring roads, which means that freight transport is channelled through the city, and the sparsity of the paved road network, which reduces travel speeds. The limited traffic management also contributes to congestion.

Figure 1.6: Public transport and paved road networks



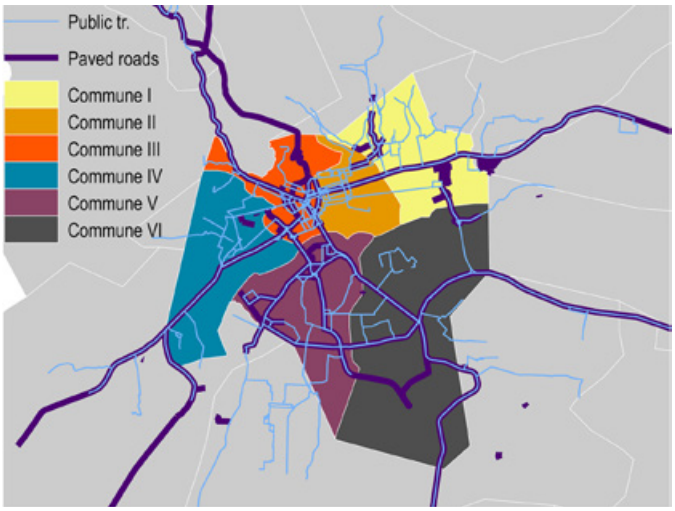
Source: Road network data from Global Road Inventory Project (GRIP) 2018; World Pop population data (2020)

Sparsity of the good quality road network is another factor that explains the difficulty of reaching healthcare and education opportunities in some parts of Bamako, given that the road network is denser in the city core while leaving the outer areas more poorly connected. Analysis of the available spatial data suggests that, although the paved road network is not particularly concentrated in central Bamako, it is very sparse and to a large extent explains the public transport route availability, with very few of the routes – especially in Bamako's southern half – going on roads that are not paved.

The Urban Sector Review for Bamako found that, while 80% of Bamako's population live within walking distance of an arterial road, insufficient paving is a major issue, significantly lowering travel speeds (World Bank, 2019b). Paved road density in Bamako lags other cities in Africa, with only 0.8 km of paved roads per km^2, compared to over 2 km in Accra, Douala, Conakry, and Abidjan (Kumar and Barrett, 2008). The public transport providers' apparent preference for traveling on paved roads is intuitive and can be explained by the lower wear and tear and risk of damage to the vehicles, which affects the transport providers' earnings, and the lower commercial speeds, due to the road condition, which mean less profit for equal density of demand. Direct evidence on the route allocation decision-making for Bamako is not available; however, recent research by Kelley at al. (2019) from Nairobi suggests that informal minibus owners in particular have a strong preference for deploying their vehicles only on paved roads.

The limitations of the road network and the public transport system – in particular, gaps in the outlying areas of the "functional city" – also have to do with institutional aspects: the reach of the Bamako city jurisdiction – such as in terms of the road network planning and public transport regulation – is limited vis-à-vis the actual size of the metropolitan area.

Figure 1.7: Transport networks and Bamako Circle boundary



Source: Road data from Global Road Inventory Project 2018

Moreover, according to analysis by the World Bank's Urban Team based on the 2016 budget execution reports for District of Bamako and communes II, III, IV, V, and VI and the 2015 budget execution report for commune I, Bamako's infrastructure expenditure is $0.72 per capita and $8,155 per km2, which is one of the lowest among developing cities, and of which only 8% and 4% is dedicated to motor transportation and roads and to public transport, respectively.

As a result, travel costs are still proving to be a heavy burden for citizens, especially those living in areas far from Commune III. The same analysis finds that Bamako allocates only 2.5% of its total budget to infrastructure expenditures whereas the average low-income city allocates 54.3% and an average African city allocates 34.2%.

2.2. Land use and city form

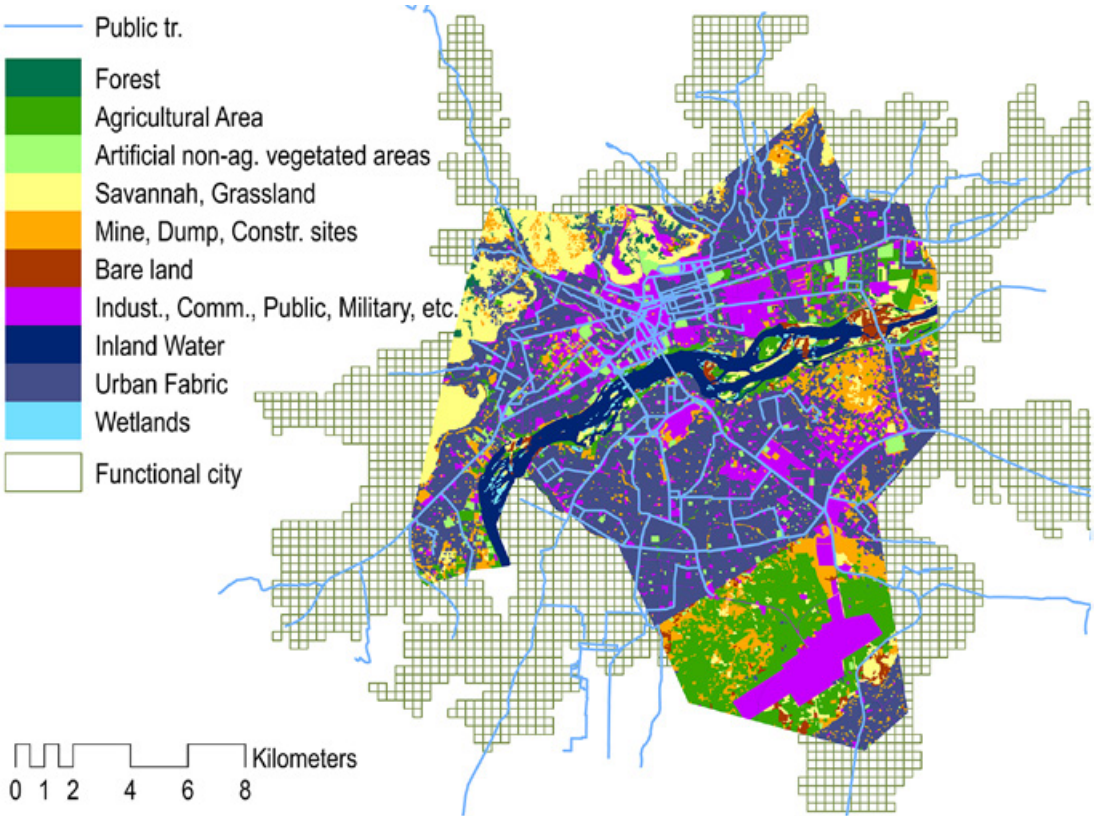
Another driver of the accessibility analysis results identified in the current study is the overall form of Bamako city and its population distribution, which is notably even, without a significant downtown peak. This explains one of the findings of the current study, notably the very low share of the population living in direct walking distance to an advanced healthcare facility (12% to a hospital or an CSRef and 6% to a hospital specifically, compared to 78% and 43% in Nairobi, for instance), given that some of the already scarce facilities are located in low-density outskirts, while the population densities around the centrally located facilities are also not high enough to ensure that a large share of the city's overall population is directly served.

In fact, as was identified in the regional study by Lall *et al*. (2017), Bamako, similarly to many African cities, is characterized by disconnectedness and spatial dispersion that makes the provision of infrastructure costly. Despite an average population density of nearly 5,700 per km^2, which places Bamako above several of its comparator cities (Harare, Dar es Salaam, Maputo, Ouagadougou, and Kigali), in many of the city's neighborhoods population densities are low, which implies a low ridership base for public transport services. The authors point out that the high fragmentation is driven by the relative lack of new development near the center: new construction is not clustered to make capital more concentrated and increase economic density; instead, it tends to push the boundaries of the city outward, resulting in so-called "leapfrog development" as opposed to infill, which makes cities denser. Leapfrog development differs from simple expansion in that expansion development enlarges a city's footprint at the edge of the consolidated urban area, while leapfrog development also enlarges the footprint, but does so by establishing satellite areas — parcels of newly built land that do not border on or overlap existing development. Lall *et al*.'s (2017) analysis of spatial imagery for 21 African cities over 2000–2010 shows that, during this period, much of new development occurred as outward expansion. However, a particularly worrying trends was the increase in leapfrog development – which was the most notable in Bamako across all the cities analysed, where it accounted for more than 50 percent of the change to the urban fabric (in comparison to less than 20 percent in Windhoek, Niamey, and Conakry).

The population of Bamako is expected to expand steadily in the coming decades, with over 3 million people to be added by 2030 in the Bamako District alone (Ville de Bamako, 2012). Inevitably, the demand for urban land will continue to grow, also because of the less predictable but likely significant additional demand generated by the arriving IDPs.

Bamako's expansion pattern has been attributed to the land tenure system, which is characterized by several layers of complexity and deters efficient and equitable urban development: currently, different land tenure regimes co-exist, ranging in formality from customary possession of land (mostly in the peri-urban area or the rural hinterland) all the way to ownership with a title/deed (in the urban core), and this complexity is combined with poor governance in the management of land at all levels of government. The city's formal land market with title deeds is very small and formalization costly, which means that the supply of formal land is limited, driving up its price (World Bank, 2019b). In the 2016 budget executions of the Bamako District housing does not appear as a budget entry at all, reflecting the current state where land subdivision schemes are pervasive and where the public has little control over the land/housing sector; it could do more to proactively build affordable housing in areas accessible to key public services.

Figure 1.8: Land use patterns in Bamako Circle



Source: Land use data from Earth Observation for Sustainable Development (2019)

The land market inefficiencies notwithstanding, analysis by Earth Observation for Sustainable Development (2019) suggests that only in few parts of the city opportunities for densification have been exhausted. During 1985-2015, there was important expansion axis along the Niger river and in south-west and east part of the city, with traditional villages becoming gradually attached to the growing city. Because the new, dis-connected development patches are often small, their isolation from existing development undermines the city government's efforts to provide the networked services that require scale economies. However, parts of city, mainly on the edges, remain underdeveloped, so there is a space for further development and strategic land preservation for essential infrastructure facilities such as hospitals (according to the analysis, vacant land and bare soil within Bamako district alone amount to over 12 km2, in addition to sizable areas of developed publicly owned land that could be redeveloped).

2.3. Institutional landscape

Another key driver of the planning and delivery of health and education services in the Greater Bamako region is the current institutional structure. The administrative landscape in Mali is characterized by institutional fragmentation and a complex relationship among deconcentrated and decentralized units of government. The District of Bamako has a governing council and six local governments (*communes*), with an additional 29 local governments composing the greater Bamako metropolitan region. Overlaps in competencies bestowed upon local governments by legislation makes responsibility for delivery of services unclear, and the lack of clearly defined and implemented functional mandates of the different decentralized authority levels constrains coordination and integrated urban planning. Some progress in this regard has already been made, with the District of Bamako's *Cellule de Préconfiguration de l'Agence d'Urbanisme de Bamako* succeeding in getting the surrounding communes to sign up to more formalized arrangements for collaboration to plan the Bamako metropolitan area; however, the coordination attempts so far have failed to materialize (World Bank, 2019b).

Another institutional gap that should be addressed to improve metropolitan scale transport and land use planning is the currently insufficient coordination between, on the one hand, the Ministry of Infrastructure in terms of the planning of major infrastructure projects and, on the other hand, the Ministry of Territorial Administration and Decentralization in terms of urban development.

2.4. "Dual quality" system

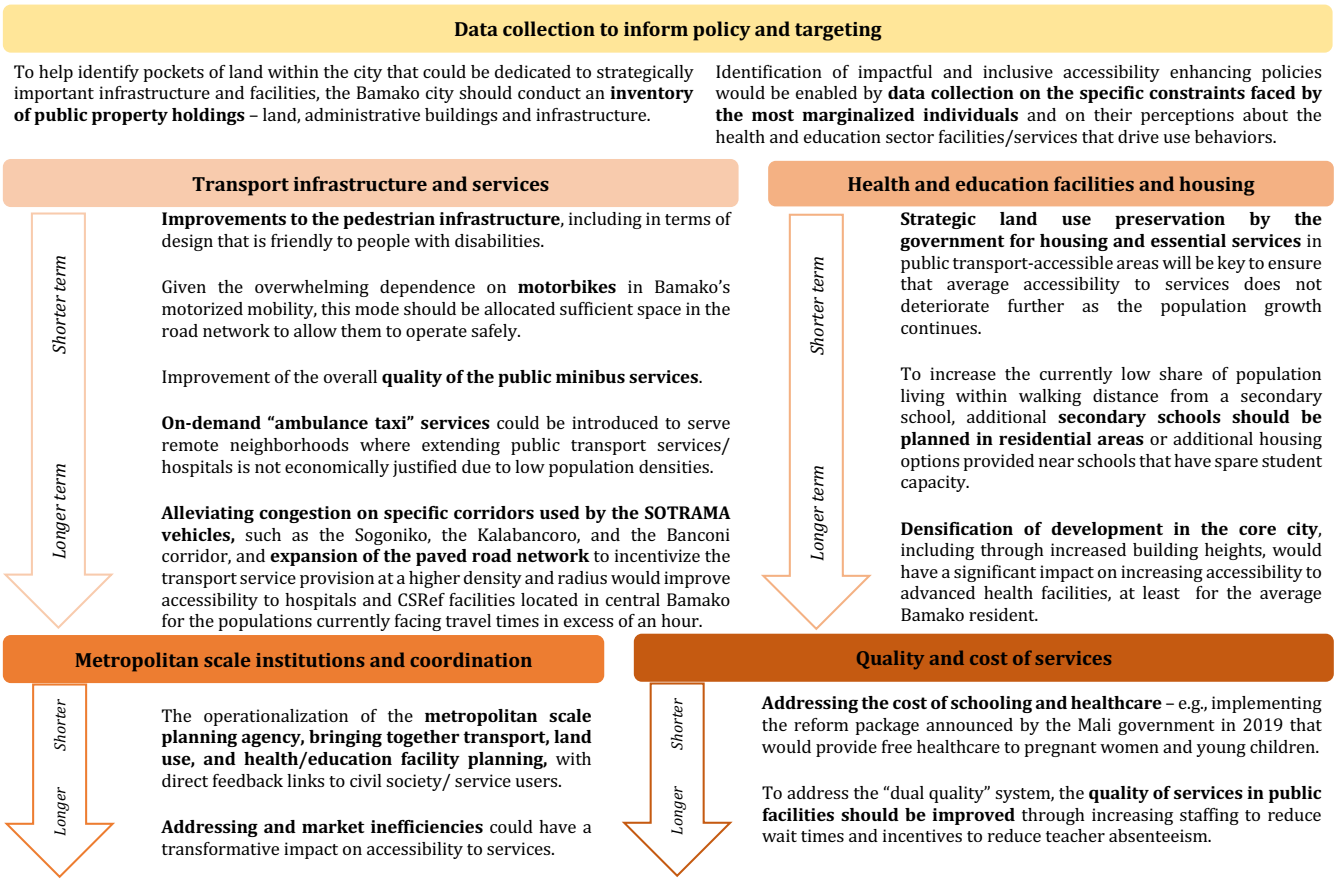
Crowding and long wait times in schools and health facilities – even if these are physically accessible – is explained by the perceived low quality of public and community facilities in particular. According to the EHCVM 2018-19 data, almost 60% of public school students in Mali report teacher absenteeism as a problem, versus 14% in private schools. Students in public schools also commonly cite a lack of teachers as a problem. Similarly, among the most common problems faced by households when visiting a health facility are long waiting times and lack of medicine, both more likely to be experienced in public facilities; the shortage of health personnel at government health facilities is similarly noted (Ataullahjan *et al*., 2020).

3. Policy actions to improve accessibility

Average accessibility to advanced healthcare facilities is lower in Bamako than in many other cities, with travel time to the nearest facility more than twice exceeding the travel times in Kampala, Douala, Nairobi, and Conakry, even if *average* travel times to schools are more acceptable. However, in addition to the overall low average accessibility to hospitals, Bamako is also characterized by significant accessibility poverty pockets, especially in Commune VI and western Commune IV, as well as on the city's north-eastern outskirts.

Urban accessibility in Bamako, as in other cities, is a product of the efficiency of the transport system and the land use patterns. Specifically, it is limited by its fragmented urban form, poor quality of the road infrastructure, an insufficient coverage of public transport, the natural bottleneck that the Niger river poses and competition for public space – including road and sidewalk. Service delivery in Bamako is hindered also by institutional fragmentation and lack of metropolitan coordination, as well as institutional and fiscal capacity at the local level (World Bank, 2019b). Finally, the Bamako residents' use of specific facilities, even if they are accessible, is hindered by quality issues. The rest of this Annex outlines a menu of policies that, if operationalized, could improve accessibility for all in Bamako's "functional city". These range in complexity and potential impact from relatively straightforward improvements in infrastructure, to more complex, yet potentially much more impactful institutional changes.

Figure 1.9: Policy menu for Bamako to improve accessibility to health and education services



Annex 2: Accessibility analysis and recommendations for Ouagadougou, Burkina Faso

1. Summary of findings: the categories and the spatial lenses

To better understand the connectivity constraints faced by Ouagadougou residents for accessing key social services and facilities, a field survey as part of this study was conducted in the city in June, 2020, altogether surveying 2,086 individuals of whom about 13% are from households that earn less than CFA 50,000 (US$90) per month and another 15% from households earning between CFA 50,000 and 100,000. About 70% of all respondents report not having any private cars owned by their household; however, 93% have at least one motorcycle or scooter (even among the respondents belonging to the < CFA 50,000 households, 72% do, indicating that this is perceived by households to be an absolute necessity to move around in the city). About 82% of Ouagadougou's households were estimated to own a motorcycle or scooter, and 66% - a bicycle – in a study conducted in 2018 (see Burkina Faso, 2018).

Only about 3% of all respondents report traveling on foot to get to a healthcare facility for regular medical needs, another 6% bike, and less than 2% use public bus or communal taxi. The vast majority of respondents (71%) typically use a motorcycle or a scooter. Distance/availability of transport represent a major constraint to accessing healthcare for about a fifth of Ouagadougou's residents, but exceeds one-third among the lowest income group.

About 35% report using a motorcycle or scooter for the transport of their children to school, and another 31% bike. Walking is also a common mode, reported by 27% of the respondents (92% among the lowest income households); while nearly nine-tenths of these respondents have at least one motorcycle/ scooter or car available to the household, it may not be available specifically for the transport of children to school or the school may simply be conveniently close to home. In contrast, only 6% use a car and less than 1% take public transport. Nearly one in four respondents say that distance/availability of transport is the main constraint or among *the* main constraints for their children to attend school. Thus, transport availability appears to be a slightly more common constraint for children to access schooling than for the overall population to satisfy their regular medical needs.

Transport cost appears to be a less important obstacle than transport availability/ distance in the ability of Ouagadougou's residents to access healthcare services, with 16% of the respondents saying it is among the main constraints. However, transport cost is among the main constraints affecting children's access to schooling for over one-fourth of Ouagadougou's residents.

Burkina Faso has a fast growing motorization rate, especially in motorbikes, with 116 motorbikes per 1,000 residents (SSATP, 2020a). The country has a total of 2.5 million registered two-wheelers, and it is estimated that two of every three trips are made by motorbikes. About two-thirds of all motorized trips are made by motorcycle, in contrast to other West African capital cities where transport services are dominated by paratransit – moto-taxis, minibuses, and similar. Compared to many other major cities in the region, a much higher share of mobility needs in Ouagadougou is also ensured by biking, which accounts for about 10% of all trips (Olvera *et al*., 2012), and nearly half of all trips in the city are made on foot, which underscores the importance of providing adequate and safe non-motorized

transport infrastructure. Bus transport services are provided by SOTRACO (*Société de Transport en Commun de Ouagadougou*). Bus ridership represents less than 1% of all trips, which can be explained by the sparsity of the bus network, with only about 30 lines operating at a modest frequency of one bus every 20 or 30 minutes (up to two hours on individual routes). Moreover, the buses are overloaded and unreliable (Commune of Ouagadougou, 2019).

In the "functional city" of Ouagadougou, which spans an area of about 689 km^2 and is home to about 3.56 million people, there are 13 medical centers with a surgical antenna (CMA) and five hospitals, which together represent the "advanced healthcare facilities", in addition to 31 medical centers without surgical capabilities (CM), and 56 basic health posts (CSPS). The 3rd arrondissement concentrates the largest number of health establishments (19), while the 12th only has 3. While the hospitals and most health centers are located in the central part of Ouagadougou and appear relatively well-connected to the SOTRACO bus network, these types of facilities are comparatively absent in the more peripheral parts of the city, especially in the north and south-east corners. While the distribution of CSPSs is more balanced, many of these facilities are far removed from the bus network. According to the National Health Policy published in 2011 (Ministère de la Sante, 2011), some progress has been made in reaching the policy goals defined in the earlier National Health Development Plan 2001-2010: in urban areas, the ratio of population per one CSPS decreased from 14,177 to 9,835 between 2001 and 2009 (compared to the defined goal of 10,000). However, the ratio is many times higher with respect to any of the more advanced medical facilities (CM, CMA, hospitals).

The spatial analysis suggests that, for the average resident of the "functional city" of Ouagadougou, nearly 57 minutes by SOTRACO bus to reach the nearest advanced healthcare facility (hospital or CMA), while reaching a hospital specifically requires an hour and a half, *on average*, by far the longest among the analyzed cities. Accessibility to hospitals and CMAs is low – exceeding an hour or even three hours in some locations to reach either type of facility – everywhere outside the immediate city center, and the SOTRACO bus lines do not appear to provide any tangible accessibility benefits to the immediately surrounding neighborhoods, explained by the limited speeds and the yet more limited headways of the bus service on most routes. In other words, one has to live next to a facility for it to be accessible, while living near a bus line, even if this line connects to a facility, does not make much difference. All of Ouagadougou's hospitals and nearly all of CMAs are located within direct walking distance to at least one bus route; however, the transport services offered on these routes are extremely limited. Only 9% of the city's population lives within 15 minutes of a hospital or a CMA (and only 5% from a hospital specifically), and this modest share appears to be almost entirely accounted for by the people who can reach these facilities by walking less than a kilometer (7% and 2%, respectively).

A total of 1,204 primary schools (of which 282 are public) and 758 secondary schools (88 public) were located in the city. The average travel time, by public transport, to the nearest primary school and secondary school is estimated about 11 minutes and 12 minutes, respectively, although accessing a public school takes considerably longer – 18 minutes and 24 minutes, respectively. While accessibility to schools is certainly better than to advanced healthcare facilities, significant parts of the

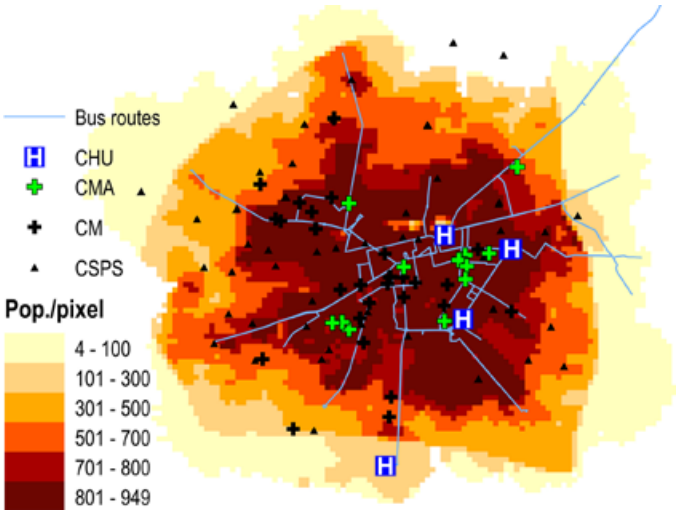
city on its edges, such as the south-eastern boundary, have travel times in excess of 45 minutes or even an hour. The value-added provided by the SOTRACO network for accessing primary schools is only about a minute of time savings, on average, which is intuitive given that primary schools are widely available in the city and about 84% of the population lives within a kilometer of at least one (however, this share is below those in Conakry, Douala, and Nairobi). The presence of secondary schools locally in residential neighborhoods is almost as high (81%); however, only slightly more than a quarter Ouagadougou's residents live within close walking distance of a public secondary school specifically. For those who cannot easily walk to a school, relying on the bus network may not be feasible, either, as only 57% of primary schools and 59% of secondary schools are directly accessible from a bus line; especially in the northern and south-western corners of the city, numerous schools are not connected to the bus network, in addition to the bus service typically being available only a couple of times an hour.

The sparse bus network of Ouagadougou appears to reach the poorest parts of the city equally well, although its effectiveness in terms of ensuring accessibility to health and education facilities is also nearly equally low.

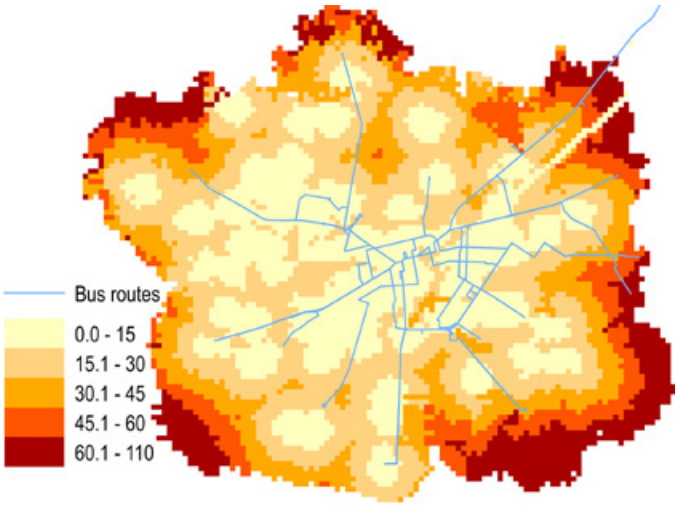
The differences in accessibility between the overall population and the city's poor are greater with respect to healthcare facilities, especially the more advanced ones (CHU, and CMA). Compared to the overall city population of whom 18% can access a CHU within 45 minutes of travel by bus, among the poor population the share is only 10%. Similarly, for accessing CMAs, the share of the poor able to access at least one within this time threshold is only 22%, compared to 34% among all city residents combined. Either a hospital or a CMA is accessible within 45 minutes for one-fourth of the city's poor, compared to 37% of the overall population. In contrast, when it comes to lower-level healthcare facilities (CSPS), accessibility for the poor by bus appears to be the same as for the overall population. With respect to school access, differences in accessibility compared to the overall city population emerge at the secondary school level, where 56% of the city's poor are estimated to be able to access at least one public secondary school within half hour of travel by bus, compared to 60% among the overall population. These accessibility differences vis-à-vis the overall population appear to be mostly driven by the absence of advanced healthcare facilities and sparsity of public secondary schools in the secteurs of the city where the poverty incidence and/or the density of the poor per area is high.

Figure 2.1: Locations and travel time by public transport to nearest facility

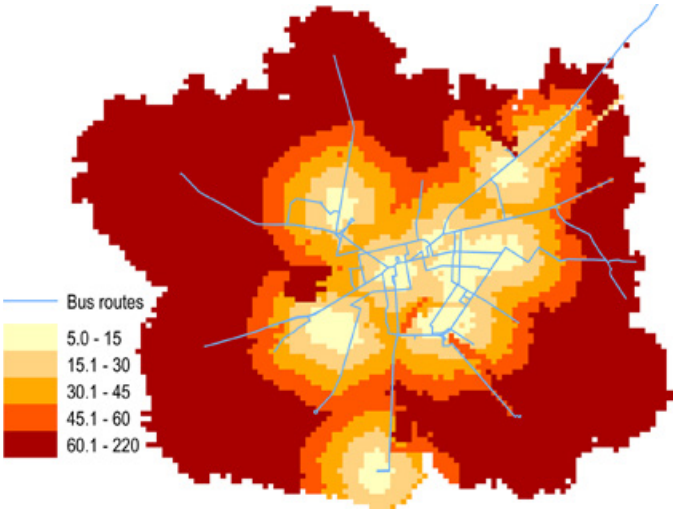
Locations of Hospitals, CMA, CM, and CSPS



Travel time to a Hospital, CMA, CM or CSPS



Travel time to a Hospital or CMA



Travel time to a Hospital

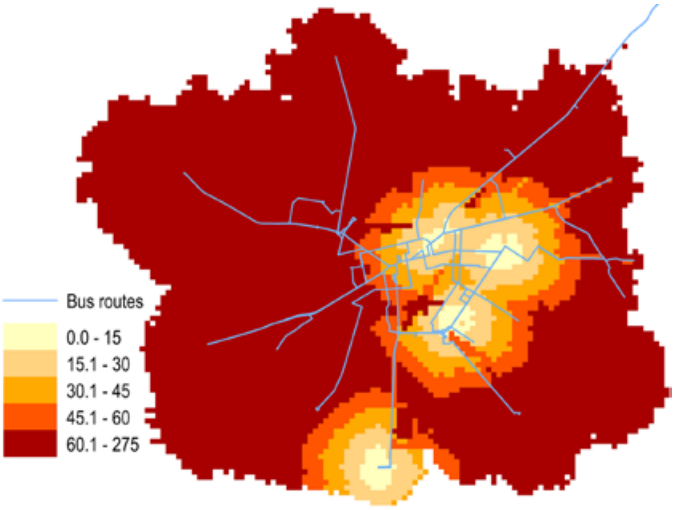


Figure 2.2: Locations and travel time by public transport to nearest primary and secondary school

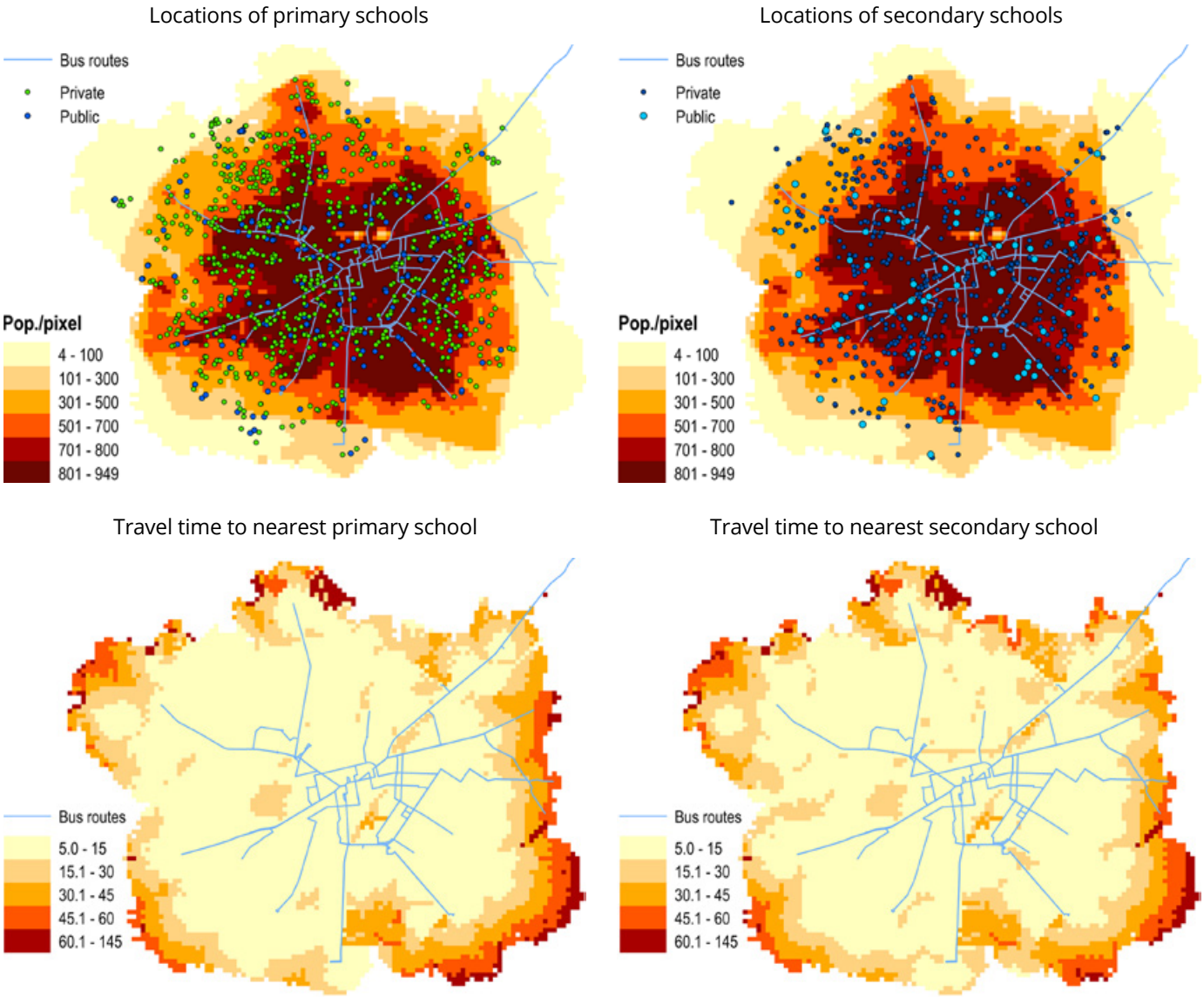
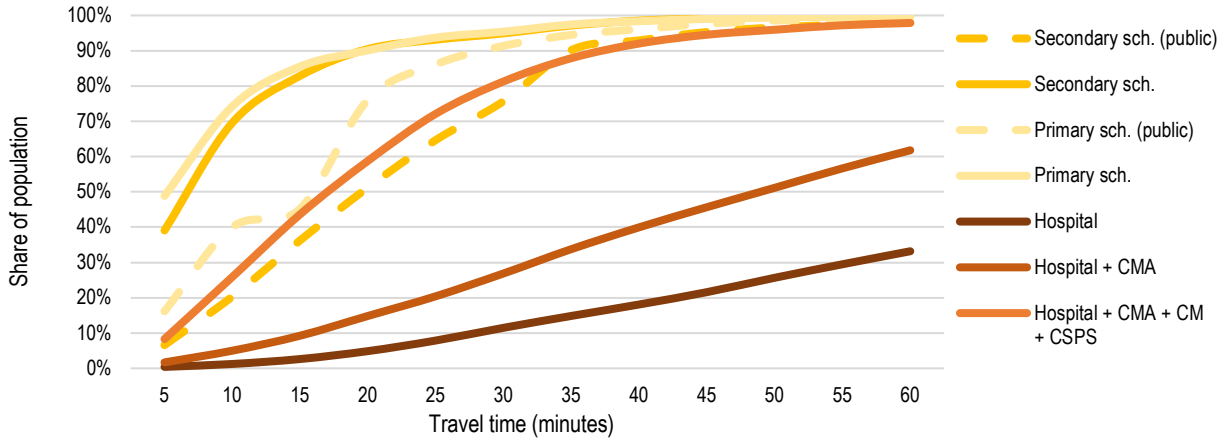


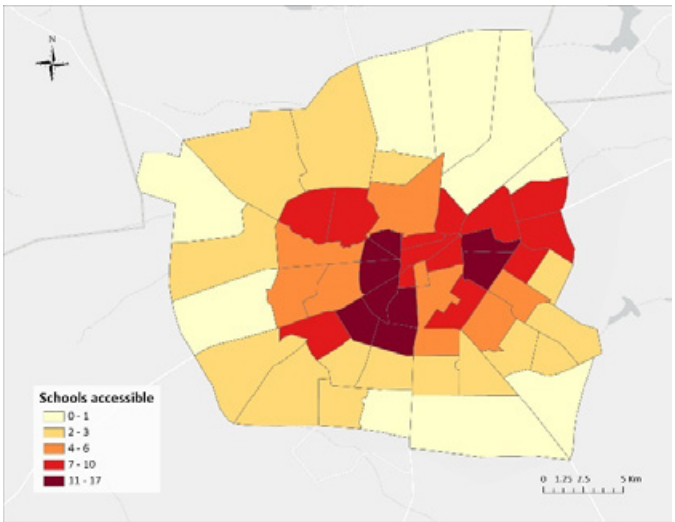
Figure 2.3: Inequality in accessibility: cumulative population share able to access the nearest facility by public transport



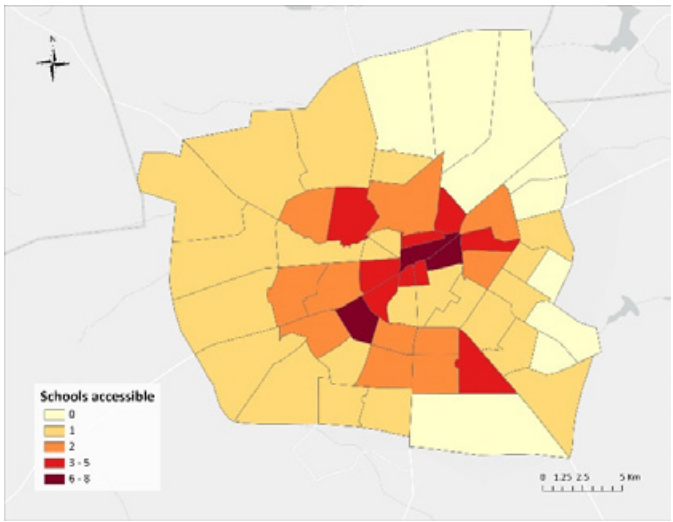
A staggering two-thirds of Ouagadougou's population are characterized by "accessibility poverty" for accessing hospitals (over an hour of travel time by public transport), while 38% of the city's population cannot reach neither a hospital, nor a CMA within this time threshold. The share of accessibility poor to primary schools and secondary schools – defined as those who face travel time in excess of half an hour one way by public transport – is 5% in both cases. However, while this share is relatively low, it does not reflect the very limited school choice that is also present, especially with respect to secondary schools: in several city secteurs, only one or a couple of schools are accessible within the 30-minute threshold to the average resident, which means that children in reality likely have to travel longer to reach a school of satisfactory quality or specific religious affiliation or a school that is affordable (public rather than private).

Figure 2.4: Public primary and secondary schools accessible to the average secteur resident by bus within 30 minutestransport

Public primary schools accessible from each secteur



Public secondary schools accessible from each secteur



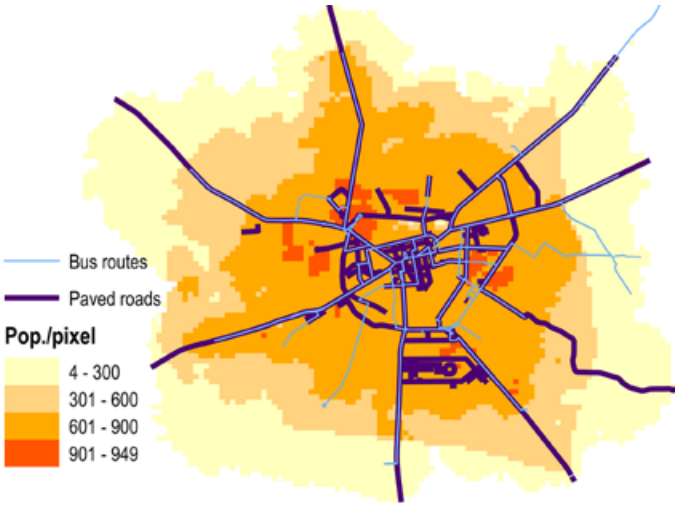
2. Explaining the findings

2.1. Transport efficiency

While the identified accessibility patterns are influenced to some extent by the public transport route allocation across the city, the accessibility benefits the bus system provides are very limited. As already mentioned, nearly all of the advanced medical facilities are connected to a bus route despite being a relatively low-frequency destination; however, this immediate proximity to bus service does not translate into accessibility gains. This is intuitive given the very limited speeds on some routes, as low as 11-15 km/h on SOTRACO lines 6 and 16 which connect Naaba Koom in the city center to Terminus Koulw Toghin (north, half way between city center and the city boundary) and Terminus Eau Maman (near the north-western edge of the city), respectively. Moreover, the headways on line 16 is reported at 140 minutes, which means that the residents of the entire north-western quadrant of Ouagadougou are served by a single route that can accommodate the needs of at most 50-80 people every 2.5 hours. Headways on the bus network are an hour or more on many of the routes in the city's central and northern part; however, also the most frequent bus service across the entire network – on routes traveling from the city center east and south-east – is only available every 25-30 minutes, which means that the buses that do arrive are overcrowded.

These spatial patterns in bus transport service availability help explain the findings from the household survey implemented in Ouagadougou in June 2020, which suggested that, at the level of the individual arrondissements of the respondents' home locations, Nr. 9 located on the north-western edge of the city stands out as having a particularly high share of residents who perceive transport availability/ distance as a major constraint for both attending to regular medical needs and also for children's schooling.

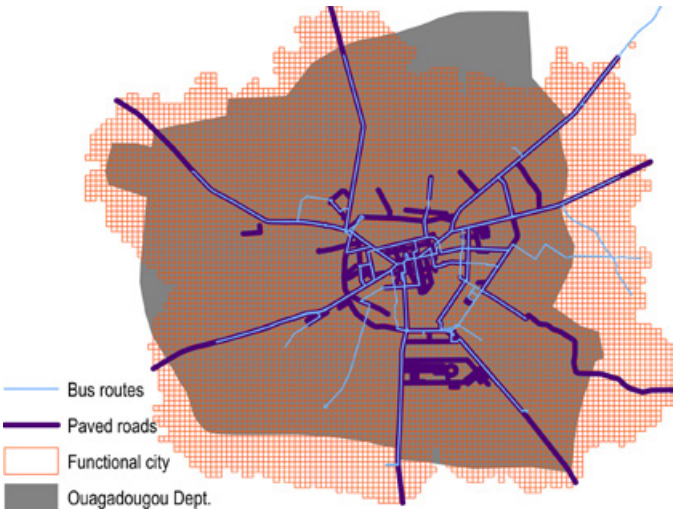
Figure 2.5: Public transport and paved road networks



Source: Road network data from Global Road Inventory Project (GRIP) 2018; World Pop population data (2020)

Even more so than in Bamako, the paved road network in Ouagadougou is extremely sparse, limited to seven radial national-importance roads. Based on the Global Road Inventory Project (GRIP) 2018 data, which indicates that there are 359 km of paved roads within the "functional city" of Ouagadougou, the estimated paved road density is thus only 0.52 km per km2 of area, which is well below the level in Bamako (estimated at 0.8 km in 2008) and only about a quarter of the level in Accra, Douala, Conakry, and Abidjan. The existing bus transport is limited almost entirely to this paved network, and even neighborhoods that are relatively central and have population densities that are moderate to high by Ouagadougou standards do not have direct access to a paved road.

Figure 2.6: Transport networks and the Ouagadougou Department boundary



Source: Road data from Global Road Inventory Project 2018

While in cities dominated by informal public transport (minibuses) the limitation of the service to paved roads can be attributed to the private operators' lack of incentives to operate their vehicles in sub-standard road conditions, this explanation is less relevant for Ouagadougou, where the bus system is not run by a private firm.[96]

The limitations of the road network and the bus system have to also be seen in light of the somewhat limited span of the Ouagadougou administrative jurisdiction, which does not cover the entirety of the "functional city" (the de facto metropolitan area). However, also within the boundaries of the Ouagadougou Department the transport network is nearly equally sparse. The limited radial road network is highly saturated also because of the historical structure of the city and its layout, whereby populations living in the periphery have to travel all the way to the city center to access the highly concentrated economic opportunities and administrative buildings.

This sparsity increases congestion on the roads that do exist, reducing travel times for private modes – motorcycles and cars – as well. Traffic in Ouagadougou is estimated to have increased by a staggering 125% just between 2014 and 2016. Recent analysis conducted for a regional report on urbanization in the Sahel region found that inland capitals, including Ouagadougou, would be the biggest gainers from investments to relieve present transportation bottlenecks across West Africa (see World Bank, 2018). The increased congestion appears to be associated with reduced overall mobility rather than longer commutes: the number of daily trips per person in Ouagadougou, at 3.8, is well below the averages in Douala (4.6) and Niamey (4.4), and 43% of the residents surveyed had either not travelled at all or only by walking on the previous day (see Diaz *et al*., 2013).

2.2. Land use and city form

Another driver of the limited accessibility, especially to advanced healthcare facilities and for the city residents who live in the outlying secteurs, is the urban form of Ouagadougou and its evolution over time. Ouagadougou is growing at a staggering 9% annually, with associated challenges to efficient mobility. Ouagadougou almost tripled its built-up area between 1983 and 2005, according to Schéma Directeur du Grand Ouagadougou of 2008, expanding in the form of urban sprawl and informal housing development in the periphery. As a result, travel demand is increasing rapidly: the flow of people moving into and out of the city center each day was estimated to have reached 1 million in 2014 and is expected to double by 2030, while the length of trips will also increase.

96 SOTRACO was established in 2003 by the State of Burkina Faso, the Municipality of Ouagadougou and private operators.

Figure 2.7: Increase in the built settlements in and around Ouagadougou metropolitan area, 2001-2019

Based on the global built settlement spatial data, the built-up land area in the Centre region in which Ouagadougou is located increased by about 77% between 2001 and 2019, with many of the newly built-up areas located along the few paved roads. Beyond the boundaries of Centre, significant new development in the two decades emerged around nearby towns such as Loumbila and Ziniare to the northeast and Kombissiri to the southeast. The most densification within the Ouagadougou Department boundaries happened along its western boundaries, corresponding to the secteurs with the highest poverty incidence *and* the lowest accessibility to advanced healthcare facilities, while nearly no increase in built settlement area took place in the city center.

As was identified in the regional study by Lall *et al*. (2017), Ouagadougou, similarly to many African cities, is characterized by disconnectedness, spatial dispersion, and the so-called leapfrog outward development, whereby new, previously disconnected neighbourhoods are absorbed by the growing sprawling city while new development near the center is lacking. In the decade between 2000 and 2010, leapfrog development accounted for nearly 40% of Ouagadougou's overall expansion, an increase compared to the previous decade and much above the shares of leapfrog development observed in many other major African cities. Given Ouagadougou's rapid population growth, which adds over a quarter million residents annually, the demand for urban land in the broader metropolitan area will continue to grow.

As a result of the outward sprawl during the last few decades, already today the average population density of the Ouagadougou metropolitan area is low, at only about 5,200 inhabitants per square-kilometer, which is half of the average density of Douala and Kampala. Moreover, as was illustrated in Figure 2.5, Ouagadougou lacks a distinct density gradient or peak even in its very center. This lack of density articulation implies that providing public services is costly, as any given facility or transport link directly serves only a limited number of people. For example, only 7% of the city's population lives within a kilometer of an advanced healthcare facility (hospital or CMA) – in contrast to over 50% in most of the other analyzed cities – and any additional facilities or bus routes to be located in parts of the city where they are currently lacking would, similarly, serve only a limited population in their direct vicinity.

3. Policy actions to improve accessibility

Accessibility to advanced healthcare facilities – not only hospitals but also advanced medical centers and even more regular health facilities – is much lower in Ouagadougou than in any other of the cities analyzed in this report. In addition, large parts of the city's western and south-eastern secteurs are characterized by extreme accessibility poverty, with over two hours of travel by bus required to reach any type of advanced healthcare facility.

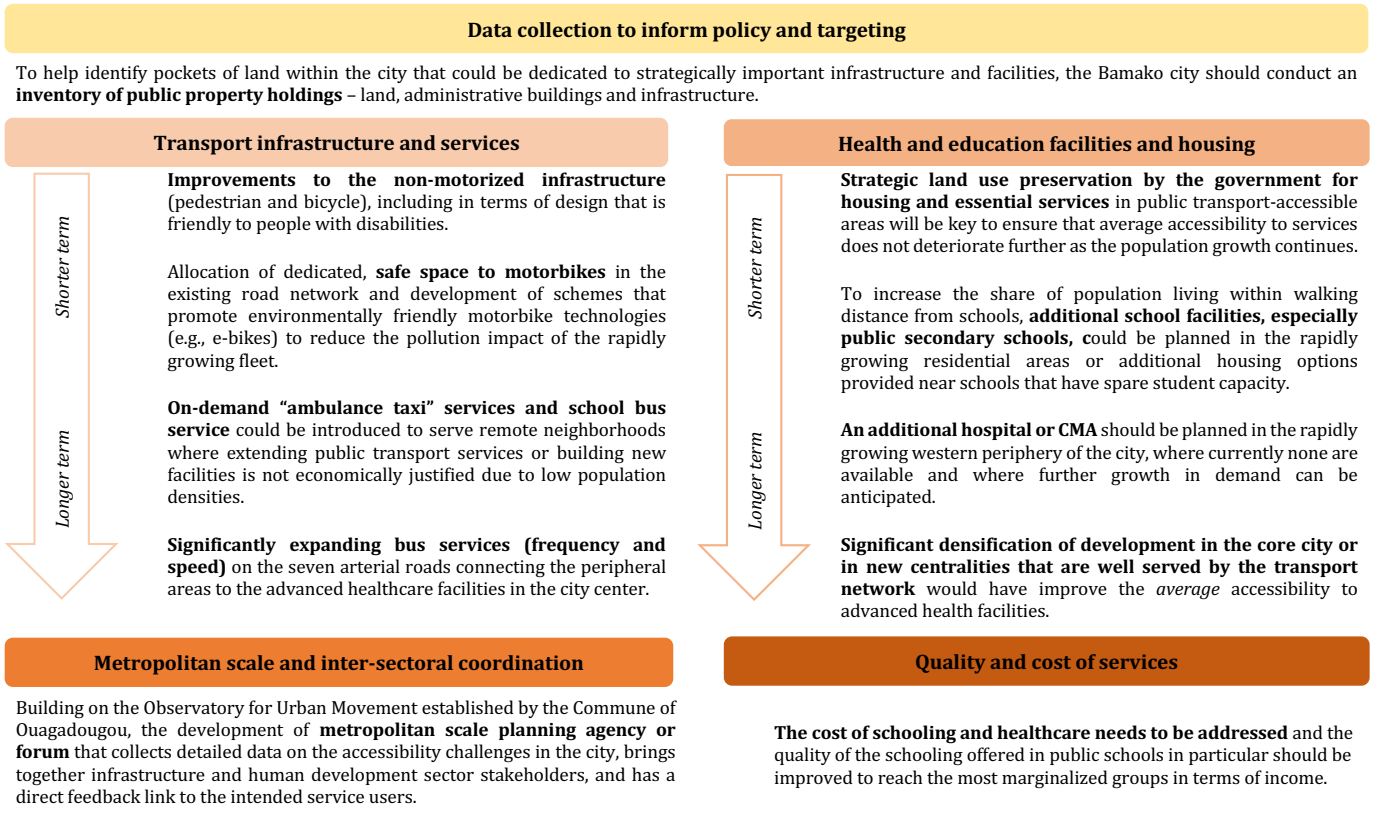
In recent years, substantial investments in the road network have been made in Ouagadougou to improve traffic conditions. The city's bypass project is also expected to shift transiting traffic away from city roads. However, given motorization dynamics, the new infrastructures will not resolve congestion problems in Ouagadougou. To optimize public spending, a multimodal mobility strategy is needed (SSATP, 2020a). Moreover, both the transport system – infrastructure and, especially, transport services – and land use planning have to be addressed in order to improve the currently low accessibility to healthcare opportunities. While the accessibility landscape is considerably better with respect to schools, targeted interventions are needed to eliminate the poverty accessibility pockets that remain or that may be created if residential development continues in the form of unabated outward sprawl rather be concentrated near the existing school facilities and the transport network.

As alluded to before, improving accessibility to advanced healthcare opportunities will require more fundamental and costly improvements in the city's transport system and strategic changes in land use planning at the metropolitan scale to ensure that future population growth is channeled into areas that are – or that could be – served by efficient public transport or that surround existing or potential new health facilities. Institutional coordination between, on the one hand, transport and housing sectors and, on the other hand, the health sector will be essential to ensure that any new health facilities that are built are served by current or potential new bus service or are located directly within rapidly densifying neighborhoods, such as on the city's western periphery.

Improving accessibility to schools could be achieved through targeted siting of a few additional school facilities in the (relatively limited) areas currently characterized by excessive travel times or through the provision of school bus services to allow the children living in these areas to reach the existing school facilities within a reasonable travel time. Considering the importance of biking, walking, and motorcycle transport in Ouagadougou's mobility, especially of the poorest residents, investments in NMT infrastructure and safe space for motorcycles in on the existing road network would help improve accessibility to both health and education facilities for many of the most vulnerable residents. In particular, well-lit and safe pedestrian infrastructure is essential to improve the safety of girls while *en route* to school.

As proposed in SSATP (2020a), a Transport Council for the Greater Ouagadougou metropolitan area should be created to bring together the city of Ouagadougou and the seven neighboring municipalities and thus ensure efficient, metropolitan scale transport and urban planning.

Figure 2.8: Policy menu for Ouagadougou to improve accessibility to health and education services



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