



FINAL REPORT: Impact of COVID-19 on the mobility of physically challenged people and older people

COVID-19 Response & Recovery Transport Research Fund

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HVT029.L1M086 – Prof. Dr M. Shafiq-Ur Rahman

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Abstract	
Transport and mobility options for elderly and individuals who need assistance are very limited. The COVID-19 pandemic has worsened the situation by many folds. This research mainly focuses the travel behaviour issues of such individual elderly, and people having mobility challenges; to know their coping strategies, to contribute to the knowledge base and raise the concerned issues in governance and policy spheres. This study will provide an excellent opportunity to compare and contrast travel behaviour, practice and strategies for elderly and physically challenged people of different culture, geography and policy diversity during COVID-19.	
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ACRONYMS

BRTA	Bus Rapid Transit System
COVID-19	Novel Coronavirus Disease 2019
DTCA	Dhaka Transport Coordination Authority
FCDO	Foreign, Commonwealth & Development Office
HVT	High Volume Transport Applied Research Programme
KCC	Khulna City Corporation
LIC	Low-income country
NGO	Non-governmental organisations
NMT	Non-motorised transport
SOPs	Standard Operating Procedures
SDG	Sustainable Development Goals



EXECUTIVE SUMMARY

Purpose

Large cities in low-income countries (LICs) are often characterised by dense settlement, insufficient infrastructure, poverty, unemployment and even discrimination. Transport infrastructure is often inadequate, unsatisfactory and inaccessible to many people especially for those living below the poverty line. Transport and mobility options for the elderly and individuals who need assistance are very limited. The Novel Coronavirus Disease 2019 (COVID-19) pandemic has worsened the situation by many degrees. This research mainly focuses on the travel behaviour issues of such individuals, aiming to discover their coping strategies. Areas of investigation are:

- Travel behaviour for the elderly and people with different disabilities;
- Changes in mobility; and
- Travel difficulties due to COVID-19.

The research contributes to the knowledge base and raises a variety of issues concerning governance and policy.

Method

The study has been designed with case studies of eight cities of four LICs from Asia and Africa: Bangladesh, Pakistan, Tanzania, and Zambia. A total of 1,669 samples (around 200 from each of the cities) were selected randomly for household surveys. A stratified sampling technique was followed so that the samples were selected from different socio-economic classes and were spatially distributed across each city.

For the elderly and differently abled people questions were asked about:

- Their mode choice;
- Preference for mode choice;
- Travel costs;
- Social distancing and personal safety;
- Problems and suggestions for improvement of mobility; and
- Knowledge of their travel behaviour before COVID-19 and during the COVID-19 pandemic.

Interviews were done using a pre-determined questionnaire during November 2020.

Key findings

The study provides an excellent opportunity to compare and contrast travel behaviour and practice for elderly and physically challenged people of different cultures, from different geographic locations with diverse policies during COVID-19. Data are analysed and presented separately for each country.

Findings are discussed under the themes of:

- Mobility and trips during COVID-19 post-lockdown;
- Mobility and trips during COVID-19 lockdown;
- Mobility and trips before COVID-19; and
- Changes in mobility due to COVID-19 and related travel problems.

It has been found that public transport services in Bangladesh, Pakistan, Tanzania, and Zambia are very poor and lack appropriate infrastructure to facilitate physically challenged people.

The travel patterns of elderly and physically challenged people in all the cities have changed due to COVID-19. The changes are:

- Reduction of travel (avoiding travel or reduced frequency of trips);
- Changed travel mode;



- Increased travel cost and decreased income;
- Additional travel difficulties due to COVID-19;
- Need to maintain physical distancing, use of masks, and hand sanitisers.

The impacts of COVID-19 during lockdown were more than the impacts during post-lockdown. During the lockdown, the amount of public transport was low and as a result those who wanted to go out for work or medical supplies had to wait a longer time or use private vehicles (or paratransit hired for taxi-type individual use). The effects were not same in the four countries as the level of 'lockdown' was different.



1. Introduction

1.1 Background

A significant share of population (at least 10%) in all low-income countries (LICs) are elderly¹ or disabled (1). However, research and data related to the mobility of elderly and physically challenged² people are very limited in LICs. The elderly and physically challenged people may have different travel needs and challenges; therefore, this topic requires a detailed investigation and policy directions. Also, they may have faced more difficulties than the young and non-disabled people for travel during the Novel Coronavirus Disease 2019 (COVID-19) pandemic. This is mainly because either the supply of transport was less, or facilities were closed during lockdown. Also, travel is more unsafe as many elderly and physically challenged people often need the help of carers and maintaining physical distancing is difficult for them. Often many of them do not have sufficient capability or awareness to maintain physical distance and health guidelines while travelling during COVID-19. For instance, an elderly person might have awareness problems, while a physically challenged person (although aware) might find it physically difficult to maintain safe distances.

Travel of physically challenged and elderly people during COVID-19 is affected adversely either because of fear of infection through physical contact with other people or because of higher travel costs due to limited travel options available. Public transport fares in many cities have increased as operators have tried to compensate for the reduction in passenger numbers. Also, the extra costs of sanitary precautions have been passed on to public transport users, adding a further burden to those with lower incomes. Even in pre-COVID-19, many citizens in Asia and Africa already struggled to cover their transport costs, and any increase in costs can represent a significant additional burden for households (2). The elderly and physically challenged people in low-income groups in LICs may have more (and diverse) problems with their travel and mobility as they rely more on public transport, which is reduced due to COVID-19. Moreover, transport infrastructure and services in LICs are not accessible or friendly for disabled and elderly people. Therefore, it is worth investigating their mobility and travel during COVID-19 and the related issues of their challenges. This research has a direct link to the sustainable development goals (SDGs): Goal 10 (reducing inequalities) and Goal 11 (sustainable cities and communities).

As part of the UK Foreign, Commonwealth & Development Office (FCDO) response to COVID-19, the Applied Research Programme in High Volume Transport (HVT) and the Research for Community Access Partnership (ReCAP) have established a COVID-19 Response & Recovery Transport Research Fund (C19RRTRF). The C19RRTRF has supported several research projects that address COVID-19 and its effect on mobility and transport in LICs. This report is the outcome of a research project supported under C19RRTRF.

This report is structured in nine different chapters. Chapter 1 discusses the background and relevant literature. Chapters 2 and 3 discuss respectively the methodology used and implementation of tasks. The main results and findings from the different countries are analysed and presented in Chapters 4 to 7. Chapter 8 provides a summary of the findings and a comparison between different countries and cities. Further research uptake and conclusions are provided in Chapter 9.

1.2 Relevant literature

Physically challenged and elderly people are often transportation disadvantaged (3). For travel and mobility, they often face many problems and constraints in accessing buses, terminals and public transport services (4). However, their constraints are not homogeneous; there are differences depending on socio-economic characteristics such as gender, household size, income, vehicle ownership, lifestyle etc. (5).

The COVID-19 pandemic has had a profound impact on peoples' mobility in almost every country around the world (6), changing activity patterns and travel behaviour. Some of these behavioural changes are in response to restrictive measures such as lockdowns while others are driven by perceptions of lack of safety and/ or commitment to slow down the spread of infection by travelling less (7). Reductions or suspensions of public transport services have had a profound social impact, particularly on poorer sections of society who often

¹ People aged over 60 years are considered as elderly in this research.

² The term disabled and physically challenged in this report are used interchangeably.



have fewer alternative means of transport access, as well as on women, elderly and physically challenged people (2). Older people are disproportionately affected by the COVID-19 pandemic (8). Persons with disability have been especially vulnerable during the pandemic; physical distancing can be particularly challenging on public transport on which a high proportion of people with disabilities rely (2). Disruptions to transport have intensified the problems for the persons with disability or elderly people, who already had difficulties in accessing public transport services. Moreover, Ainslie and Foubert (9) found that a higher proportion of disabled people (compared to non-disabled people) are worried about the effect of the COVID-19 pandemic on their well-being.

A range of studies from different countries (mostly western or non-LIC countries) focusing on the impacts of COVID-19 on mobility have demonstrated that different sociodemographic groups have changed travel behaviour in response to COVID-19 in different ways (7). The potential implications of lockdown and physical distancing norms on daily travel patterns are the reduction of travel demand and reduction in the use of public transport respectively (10). For example, due to COVID-19, approximately 80% people in the Netherlands reduced their outdoor activities, with a greater decrease for elderly people (11). The use of motor vehicles in the UK fell by about 20% before the lockdown was imposed and more than 60% during the lockdown (12). In Switzerland, the number of trips fell by 40% (from about 5 to 3 per person per day) and the total-miles travelled for work trips (13). Concerning mode-specific frequencies in Switzerland, there was a reduction of distance travelled by all the modes except bicycle, with percentage changes varying substantially by income, employment and car-ownership (13). In Australia, along with a decline in total use of all modes of transport, there was a higher percentage of travel by the private car during the pandemic since it was considered to be the most 'comfortable' mode by respondents (14). Studies clearly show evidence of change in mode usage patterns due to COVID-19 (11). For example, there has been a declining modal share of public transport and ride-hailing services because these are considered by the public as having a potential risk of exposure to the coronavirus. On the other hand, personal cars, bikes and walking are viewed as the safest modes of transport (14, 15, 16, 17).

Research and published documents on travel and mobility of physically challenged and elderly people in the contexts of LICs are very limited (18, 19, 20, 21, 22, 23, 24). More importantly, to the best of our knowledge, only a very few studies (2, 6, 7, 25, 26) in LICs focus on the impacts of COVID-19 on travel behaviour or mode choice. Given that the impact of COVID-19 is greatest for physically challenged and older people, it is vital that they are included in such studies (8). However, to the best of our knowledge, no studies to date have investigated the changes in travel behaviour due to COVID-19 for the physically challenged and elderly people in the context of LICs.

1.3 Project aims and objectives

Research and data on travel and mobility of elderly and physically challenged people in developing country contexts, particularly in LICs, are very limited. COVID-19 related research and studies have gained momentum recently. However, research on travel impacts due to COVID-19 in LICs, particularly focusing the elderly and physically challenged people, is still very limited.

The main purpose of this research is to understand the mobility of elderly and physically challenged people in LICs during COVID-19. The detailed objectives are:

- To explore if there are any significant changes in travel and mobility of elderly and physically challenged people due to COVID-19; and
- To identify the major constraints and issues related to travel and mobility of elderly and physically challenged people.

This research will provide new information and will enable relevant stakeholders to understand the mobility scenarios in LICs in the changed transport world. This evidence-based knowledge will be helpful for city authorities, non-government organisations (NGOs) and development agencies in identifying priority actions required for immediate responses and recovery, and in providing guidelines (and relevant support) related to transport and mobility. The immediate responses/ recovery and policy will be helpful for local elderly and physically challenged people to ease their mobility and/ or to overcome their mobility constraints. It may also



improve their access to transport and services, thus potentially leading to more participation and involvement in productive or income generating activities during COVID-19.

1.4 Transport measures taken by the cities and authorities during COVID-19

Cities and authorities in different countries have taken a variety of efforts (short-term actions) and policy measures for the transport sector during COVID-19. To stop the spread of COVID-19, governments have imposed full or partial lockdowns. During lockdown people's ability to travel has been restricted in many cities by suspending public transport operations or services and by imposing restrictions on the movement of private vehicles and on freight movement (2, 27). During post-lockdown, as the literature shows, very common measures or actions for the transport sector due to COVID-19 are:

- Maintaining physical distancing in public transport and public places;
- Wearing a face mask during travel;
- Providing free hand sanitising in vehicle or station for the passengers and crews;
- Regular cleaning and disinfecting the vehicles.

1.5 Alignment with the HVT research themes, priorities and programme objectives

This research is aligned with the HVT research theme "Gender, inclusion, vulnerable groups, and road safety". The research is aiming to help in the fast-tracking of evidence-based knowledge on mobility of elderly and disabled people that can support immediate responses and guide recovery and/ or policy in a changed transport world in LICs. Also, it aims to provide a learning resource which could be used by the providers of transport related infrastructure and services (e.g. local government, public transport operators). The research is related to the "impacts of and responses to COVID-19 in addressing social inclusion and equity issues in low/ high-volume transport" including impacts on the mobility of people with disabilities and elderly people. Thus, the research is linked to COVID-19 and transport, particularly including the cross-cutting areas and inclusion of transport.

1.6 Alignment with FCDO priorities

This research is aligned with the priorities of the Foreign Commonwealth and Development Office (FCDO). The FCDO puts priority on "strengthening resilience and response to crisis" and "tackling extreme poverty and helping the world's most vulnerable" (28). Since COVID-19 is now the biggest global crisis, understanding its impact on human travel behaviour, and helping to make infrastructure, regulation and governance more resilient and people-centric, are very much aligned with this FCDO priority.



2. Methodology

2.1 Summary of approach

Mobility related information about elderly and physically challenged people before and during COVID-19 was collected to understand their usual travel behaviour before COVID-19 and during the pandemic. This information revealed problems or challenges for mobility they face in both usual circumstances and during COVID-19. For the research, a mixed-method (both quantitative and qualitative) approach was followed.

This research is an exploratory study and has followed a case study approach. The case studies were conducted in eight different cities from the following four countries:

- Bangladesh: Dhaka and Khulna city;
- Pakistan: Karachi and Lahore city;
- Tanzania: Dar-es-Salaam and Zanzibar city; and
- Zambia: Lusaka and Kitwe city.

More information about these locations can be found in Appendix A. The research director was based in Dhaka, Bangladesh. A researcher from each country was responsible for collecting the data and coordinating all the relevant activities in the respective country and cities. The researcher responsible for the case studies in a specific country (country coordinator) employed the required researchers and enumerators for data collection and analysis. Each city had a separate team of enumerators for data collection, sorting the data, data input and preparing the database. The country coordinator prepared the draft report and then shared the findings and outcomes with the project director through email. Having a researcher from each country was very helpful for addressing local issues and problems efficiently. For example, it helped communication with the respondents about local norms and customs of the society. It also helped overcome ethical issues in data storage and transferral, thus making overall cost savings. However, doing all this required effective coordination and regular (once or twice per week) follow-up meetings with the project director.

2.2 Methods and techniques

A generic questionnaire was prepared for data collection. The questionnaire was then tailored/ adapted for country specific conditions, considering the socio-economic context of the city concerned, and was translated into the local language by the respective researcher.

A total of 1,669 respondents (around 200 from each of the city) were interviewed during November 2020, maintaining proper physical distance and health guidelines. A stratified sampling technique (considering gender, social class or economic condition, spatial distribution, disability type) was followed to address diversity issues. While selecting the samples, it was carefully ensured that representatives from all the diverse groups and from different areas of the city were included to represent the whole population of interest. Each city was divided (hypothetically) into 50-60 strata (or neighbourhoods) and then around 20 to 40 strata were selected for the survey. When selecting the strata, it was ensured that they represent the socio-economic variation and spatial distribution of the city concerned. Typically, there are 500 to 1200 houses in each neighbourhood, depending on each different city). From each of the strata, around 6 to 9 individual respondents were drawn randomly for conducting interviews, according to a method described in the paragraph below. A list of the strata for each city where the surveys were conducted is available in Appendix B. The face-to-face interviews were conducted at household level using a pre-determined questionnaire. A digital questionnaire in Smartphone or Tab was used in Zambia while a paper-based printed questionnaire was used in all other countries for conducting the household surveys. Appendix C shows a sample questionnaire used for the household survey. The household survey provided both quantitative and qualitative data concerning the respondents.

The enumerators visited the selected neighbourhood and started to visit a house (by knocking on a door) randomly from a corner of the neighbourhood to see if the house had any elderly or physically challenged inhabitants. If there was more than one such inhabitant in the house (or in multiple households in different apartments of the building), the interview was done with one person (the person with whom the enumerator



met first). If there was no such person in that house, the enumerator went to the next house until (s)he got a valid sample. After completing an interview with a respondent, the enumerator approached the 11th house (along a road towards the centre of the neighbourhood or towards another corner) to see if there was a suitable respondent to conduct the interview. If a suitable respondent was not available in that house, the next house was approached; however, if a respondent was found then, again, the 11th house was approached for the next respondent. This systematic technique helped to get the responses spread across the whole neighbourhood. The enumerator repeated the technique until (s)he got responses from 6-9 samples in a neighbourhood. There were more elderly people than physically challenged people. Except in Dar-es-Salaam and Lusaka, it was often the case that, when using the technique, 8-10 respondents in a neighbourhood were found elderly but none was a physically challenged person. Therefore, it was decided that at least 2-3 respondents from each neighbourhood should be physically challenged person. Hence, if initially all 5-6 respondents of a neighbourhood were elderly persons, then the selected house/ sample was not considered for interview unless the respondent was a physically challenged person. Moreover, if no physically challenged person was found from a neighbourhood by the above technique, then information from local people was used (based upon snowball methods) to identify physically challenged people.

In addition, an online survey was also conducted by using Google Forms in all cities except those in Tanzania. The weblink for the survey questionnaire was disseminated through email and through other online social media such as Facebook. The weblink was shared and disseminated via different professional and social public groups of the respective city, requesting people who were elderly or disabled to take part in the survey. Using information communication technology (ICT) and online social media usually can help to reach and collect many responses within a very short span of time. Online surveys provide mainly quantitative data. However, recent post-election restrictions imposed by the government of Tanzania on using the internet and related accessories did not provide favourable circumstances for conducting an online survey. Therefore, in Tanzania, an online survey using Google Forms was not conducted and only the household questionnaire survey was done. Nevertheless, not everybody in the LICs has access to the internet or feels confident in using electronic gadgets such as computer or smart phone. Moreover, the elderly and physically challenged persons may have other issues in using email or online social media (e.g. do not know how to use, no internet connection or expensive). Thus, there is an important limitation that data collected using online techniques may not be representative of the whole population, e.g. of different socio-economic backgrounds or disability types might be under-represented. Rahman et al (29) explained that using online platforms and computer-aided technology for data collection in developing country contexts, particularly involving illiterate and poor people, is not appropriate and special attention from the researcher is required.

2.3 Innovation in this research

The major innovation of this research concerns creating new knowledge about the travel behaviour and mobility constraints of elderly and physically challenged people in LICs during COVID-19, and about how they are coping with the crisis.

For conducting household surveys, a paper-based printed questionnaire was used in all the countries except in Zambia. The commencement of the household survey in Zambia was delayed for more than a week. Therefore, an App (the weblink being like Google Forms) in Tab or Smartphone for collecting/ storing responses was used by the enumerators in Zambia instead of the paper-based questionnaire. To the best of our knowledge, this method has not been used before for travel data collection on elderly and disabled people in African contexts. This helped to reduce additional efforts and time required for after-survey data input, as well as for preparing the database and the visualisation of data. The household data collection in Zambia was thus completed on time and the database was ready for analysis at the same time as the databases for other countries were available.

Moreover, a smart technique – combination of ICT and online social platform – was applied to get responses from the relevant sample population. For example, using the Google Forms and disseminating the weblink emails and social medias were helpful to minimise the time and efforts for data collection and data input or analysis for the visualisation or interpretation.



2.4 Risks and mitigations

Preparing the questionnaire and pre-testing took a week longer than the original planned time. The delay was due to the process of recruiting enumerators and providing them with the required training. To complete the household level surveys by the specified deadline, multiple enumerators were assigned in each city (the original plan was for one per city).

As stated above, the commencement of the household field survey in Zambia was delayed for more than a week. The delay was mainly because the enumerators needed money for transport and other expenses required for surveys before carrying out their work. The country coordinator for Zambia had to organise funds prior to hiring enumerators and then deployed three enumerators. In the other countries the enumerators did not need to be paid in advance.

In Tanzania, immediately after the national election, at the beginning of November 2020, the socio-political situation was not stable in Zanzibar. Therefore, the commencement of the household survey was delayed for more than a week. The country coordinator responsible for Tanzania very carefully observed the situation for nine days and then deployed the enumerators when the situation returned to normal. However, completing the interviews (achieving the required number of sample responses per day or week) was much slower than had been planned. The country coordinator in Tanzania had difficulties both in communicating with the enumerators in Zanzibar when supervising them remotely as well as in receiving feedback on time. The delay in completing the surveys in Zanzibar affected the progress of tasks in Tanzania as well as the overall research for about three weeks. Furthermore, as already mentioned in Section 2.2, the planned online questionnaire survey using Google Forms was not conducted in Tanzania since it was not possible due to post-election restrictions by the government on internet and electronic gazette use in the country.

The number of responses received from the online survey was very low for each country. After distributing the weblink, the researcher had no control over whether people responded to the online survey once they had received the weblink. Even in the first week, there was no response. Therefore, a widespread publicity campaign was conducted (e.g. re-sending emails and re-posting on Facebook) requesting people to take part in the survey. Moreover, the country coordinator in Pakistan asked his undergraduate students to request family members who are older or disabled to fill up the survey link. This repeated effort of publicity and request was continued every week which helped to get some responses. However, the total number of responses received from the online survey was still low.

2.5 Ethical review

Ethical considerations were strongly followed. Local approval and permission required from the government for work concerning COVID-19 was received by the respective country coordinator, or (s)he used similar approval already granted to his/ her institution under another research framework.

A short summary about the research was available at the beginning of the questionnaire used for the online survey. For the household survey, the respondents were clearly briefed about the research and were told that taking part in the interview was voluntary. Respondents were further informed that it would be possible for them to withdraw from completing the questionnaire at any stage of the interview if they felt uncomfortable in answering any of the questions or did not want to continue. The identities of the respondents were not disclosed. Data were encrypted and stored safely in a secured place. Data were encrypted while transferring by email. All the information used from secondary sources were duly acknowledged and referenced. Overall, UK data protection standards and ethical considerations were followed in this research during the phases of data collection, data storing, data transfer and analysis.

2.6 Quality assurance

The quality of each task for this research was maintained with a high standard. Brainstorming and group consultation among the research team members were performed in each stage. Pre-testing of the questionnaire was done in each case study city in the 1st week of November 2020 before finalising the questionnaire. After finalising the questionnaire, training was provided to the enumerators to explain how to conduct the interviews and prepare the database. The database was cross-checked in the 3rd week of December 2020 for validation. This report was reviewed by a member of the research team.



3. Implementation

3.1 Description of the case study cities and COVID-19 situation

The case study cities are made up of the capital city and another major city (in terms of population and land area) of the respective country. Table 1 shows the population, area, and brief information about COVID-19 lockdowns in the cities. A detailed description of the case study cities is available in Appendix A.

Table 1: Summary of the case study cities and COVID-19 lockdowns

Country	City	Area (sq.km)	Population (million)	Modal share of trips and transport situation before COVID-19	COVID-19 lockdowns
Bangladesh	Dhaka	1,528	14.5	Rickshaw (37%), bus (37%), car (7%), walk (18%).	Nationwide lockdown - transport ban, 26 March to 31 May 2020.
	Khulna	45.65	1.5	Easybike (37%), rickshaw (18%), motorcycle (11%), bicycle (5%), walk (21%).	
Pakistan	Karachi	3,530	16.1	Modal share of trips: public transport (43%), motorcycle (17%), car (22%), paratransit (8%).	Nationwide strict lockdown from 1 April 2020 for two weeks.
	Lahore	1,772	12.6	Lahore Metrobus Service (MBS) and Orange Line of Lahore Metro.	
Tanzania	Dar-es-Salaam	1,393	6.7	Modal share of trips: daladala (62%), walk (17%), car (13%), motorcycle (2%), train & boat (6%).	Nationwide closure of schools for 3 months, ending June 2020.
	Zanzibar	15.5	1	Bicycle (41%), car (27%), bus (13%), motorcycle (17%).	
Zambia	Lusaka	418	2.8	Walk (65%), public transport (23%), car (10%), bicycle (2%).	Close academic institutions from 20 March 2020 until 1 February 2021.
	Kitwe	777	0.52	Poor transport systems; small buses are the most used public transport mode.	

Sources: 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41.

In Bangladesh, the first case of COVID-19 was identified and confirmed in Dhaka on 8 March 2020. On 22 March 2020, the government declared the enforcement of a lockdown labelled as 'general holidays'. A transport ban was implemented on all modes across the country from 26 March to 4 April 2020, accompanied by the closure of all businesses, industries and educational institutions except those providing essential necessities (e.g. pharmacies and groceries). Following the declaration of 'general holidays', many people from the major cities moved to their native homes in villages and rural areas. Different sources estimated that around 10 million people left Dhaka city during the 10-days 'general holidays' (42). The lockdown and transport ban were extended until the end of May 2020. The lockdown adversely affected business and the economy. Therefore, despite a rise in COVID-19 positive cases, offices were re-opened and public transport services were resumed on 31 May 2020, ending 66 days of lockdown measures. Public transport was allowed to operate on a limited scale (e.g. using only 50% of seating capacity) and subject to passengers' compliance with health and safety guidelines such as maintaining physical distancing and wearing face masks. Since then, 'local lockdowns' continue to be implemented, based on situations where confirmed positive cases are very high. Academic institutions will remain closed until 30 June 2021. On 3 April 2021, government again declared a lockdown, initially from 5 April to 19 April 2021 and then extended until 23 May 2021.

In Pakistan, the first case of COVID-19 was reported in Karachi on 26 February 2020, followed by a second case on the same day in Islamabad (43, 44). The government has taken several steps to control the epidemic including the provision of testing facilities in hospitals, developing quarantine centres, and Standard Operating Procedures (SOPs) for public places with strict enforcement (44). The first lockdown was implemented from 23 March 2020 in Sindh province followed by a nationwide lockdown in the country from 1 April 2020, with strict enforcement. This placed low-income groups at high risk of starvation (many of them



could not afford food) and economic losses for everyone. Therefore, a ‘smart lockdown’ was introduced in mid-April 2020 by initiating the re-opening of mosques followed by the further opening of various public places. These re-openings were accompanied by the enforcement of SOPs, i.e. physical distancing and usage of masks, prohibition of entry or access for less immune age groups, particularly children and elderly people. However, the ‘smart lockdown’ involved implementing strict lockdown in specific areas with a high amount of COVID-19 positive cases (45). The total confirmed COVID-19 number of positive cases reported in Pakistan up to 31 December 2020 was 482,178, with more than 10,000 deaths. The most affected province was Sindh with 222,999 cases and 3,670 deaths (46), with the cases reported in Karachi comprising around 60% of total cases in the province. Lahore had around 50% of the total 138,608 cases in Punjab province (47, 48). The COVID-19 pandemic has not only caused the loss of life but also affected the overall economy. The GDP growth declined from 1.9% in 2019 to 1.5% in 2020 (49) and the economic loss of the country has been estimated to lie in the range of \$16.38 million to \$4.95 billion (50).

In Tanzania, the first case of COVID-19 was reported in Arusha on 16 March 2020 and within two months 509 cases were confirmed in the whole country with more than 20 deaths (51). From May 2020, the government stopped producing data on infections and deaths related to COVID-19. The lockdown period in Tanzania lasted for about three months, ending in June 2020. Whilst offices and businesses were not closed during the lockdown period, schools and universities were closed. There was a requirement that public transport vehicles should not carry more passengers than the number of their seats. Furthermore, there was a discouragement of holding public social activities and an enforcement of using face masks. However, livelihood and production activities such as industries, offices, business and commercial activities continued as usual.

In Zambia, the first case of COVID-19 was identified and confirmed on 18 March 2020. On 20 March 2020, the government announced that all academic institutions (schools, colleges and universities) would be closed. A total of 70 cases were identified as COVID-19 positive and three people died in April 2020. The government announced major restrictions on international travel and on the holding of social events such as church services and weddings that involved large gatherings of people. This was done by introducing a mandatory requirement for prior approval from the relevant government departments. Strict regulations were enforced on public transport to ensure that commuters were protected. By December 2020, the country had recorded a total of 20,725 confirmed cases with 388 deaths. On 12 January 2021, the country confirmed a second wave and all learning institutions remained closed. Schools were re-opened on 1 February 2021.

3.2 Activities conducted

The questionnaire for the household survey was prepared, adapted for the local context of the respective country and pre-tested. A half-day training course was provided to the enumerators in each city to explain how to conduct the interviews and prepare the database.

Household surveys were conducted with a total 1,669 respondents; Table 2 shows the distribution of the sample from different cities with respect to gender and disability. In terms of gender, the majority of the samples were males. Though the numbers of male and female respondents in Dhaka, Zanzibar and Lusaka were similar, women made up a low proportion in Dar-es-Salaam and Kitwe, and a very low proportion in the other cities, namely Khulna, Karachi, Lahore. Among the respondents, the number of elderly people was generally much higher than the number of disabled persons. The number of elderly and disabled persons in Zanzibar and Karachi was similar, while the number of disabled persons was higher than the number of elderly people in Dar-es-Salaam and Lusaka, but very low in all other cities.

Table 2: Household sample distribution from different city

Country	City	Total Respondents	Gender		Disability	
			Male	Female	Older	Disabled
Bangladesh	Dhaka	253	141	112	201	52
	Khulna	200	174	26	160	40
Pakistan	Karachi	209	144	65	117	92



Country	City	Total Respondents	Gender		Disability	
			Male	Female	Older	Disabled
	Lahore	237	175	62	156	81
Tanzania	Dar-es Salaam	203	127	76	75	128
	Zanzibar	155	88	67	73	82
Zambia	Lusaka	201	103	98	59	142
	Kitwe	211	130	81	138	73
TOTAL		1669	1082	587	979	690

Google Forms was used for the online survey and the weblink was shared through email and Facebook. A separate weblink or questionnaire was prepared for each country, as shown in Appendix D. For Bangladesh one questionnaire was prepared in English with another in the local language Bangla. For Pakistan and Zambia, the questionnaire was only in English. The weblink was live for accepting responses from mid-November to mid-December 2020. The weblink was also distributed through emails and Facebook to different groups, with a request to take part in the survey if the recipient was an elderly or disabled person in the respective case study cities. The distribution of the weblink was not balanced in terms of getting a representative sample. However, no response was received in the first week. Therefore, the email was sent again and re-posted in Facebook. The researcher in Karachi requested his undergraduate students to share this form with their elderly or disabled family members.

The responses received from the online survey were very low - only 16 from Bangladesh, 88 from Pakistan, and 15 from Zambia (responses from different cities are shown in Appendix D). Though the survey was targeted at the case study cities, it was available to people throughout the country as the weblink was shared through social media. A small number of responses were received from people outside of the case study cities (e.g. from another city or from rural areas of the country). Received a very small number of responses from the online technique mainly because many people in LICs are illiterate and poor who do not have electronic gadgets with internet access. Not many elderly people in LICs are comfortable with using electronic gadgets and internet. Moreover, usually online surveys have a demographic bias associated with the younger people who are internet savvy (7). Data from online surveys for similar research in Bangladesh (6, 25) also showed that the respective datasets had an over-representation of young adults. Most disabled people are poor (52) who don't have access to internet and many disabled people may not be capable to use electronic gadgets due to blindness, mental impairment or development disability. Thus, in an online survey a large portion of elderly and physically challenged people often remain outside of the survey.

3.3 Target groups

Potential stakeholders of this research are: city authorities (e.g. local or municipal government); non-government organisations (NGOs) and development agencies; transport service providers; and city transport authorities. The results will be helpful for city authorities and governments when making policy decisions, formulating strategies and making investment plans related to transport. The Planning Department of Khulna City has agreed to take into consideration the results of this research while implementing relevant transport/ infrastructure projects. A summary of the findings will be provided to the city authorities and transport agencies of the case study cities. The new knowledge derived from this research will be transferred among the practitioners of different agencies in case study cities as well as in other cities of LICs.

3.4 Data analysis

Collected data from all the case study cities were sorted and cleaned, and then the database was prepared for analysis. Collected data were analysed using SPSS and MS Excel.

Even though data were collected by two different methods (i.e. household survey and online survey), the analysis of this report is mainly based on the household data. The responses received from the online survey is very biased and not representative of the population of the city. For example, the respondents are mainly



from wealthy families owning a personal vehicle and from highly educated retired professionals; there was no response from physically challenged people. Therefore, only the household data has been considered for the analysis of this research.

Data were analysed to depict the travel patterns (e.g. frequency of trips, availability of public transport for the trips) and the trip characteristics (e.g. purpose, distance, mode, travel time, travel cost) of the respondents during COVID-19 (both during lockdown and post-lockdown) and before COVID-19. Major travel changes and problems due to COVID-19 were also identified. Relevant tables and figures were prepared. Data for the cities of a respective country are analysed and presented in chapters four to seven, for each country respectively.



4. Findings from Bangladesh

This chapter reports on the data derived from Dhaka city and Khulna city in Bangladesh. The data was collected from household surveys in various locations of the cities. Totals of 253 and 200 respondents from Dhaka and Khulna respectively were interviewed.

4.1 Socio-economic profile of the respondents

Most of the respondents (80% in Dhaka and 94% in Khulna) are elderly people and mostly belong to the age group of 61-70 years, as seen in Appendix Table E1-1. A detailed socio-economic profile of the respondents is available in Appendix E1. In terms of disability, 79% and 80.5% respectively in Dhaka and Khulna are without any physical challenge and the remainder have such challenges (Table E1-2). Of the respondents, 64% and 71.5% in Dhaka and Khulna respectively perform their daily needs themselves while 36% and 28.5% respectively are dependent on family members or relatives (see Table E1-3). Only a small percentage of respondents, 2% and 0.5% respectively in Dhaka and Khulna, live alone (in Table E1-4). Most of the respondents have a household size of between 4 and 5 members.

Figure 1: Monthly household income, individual expenditure of respondents in Dhaka and Khulna city

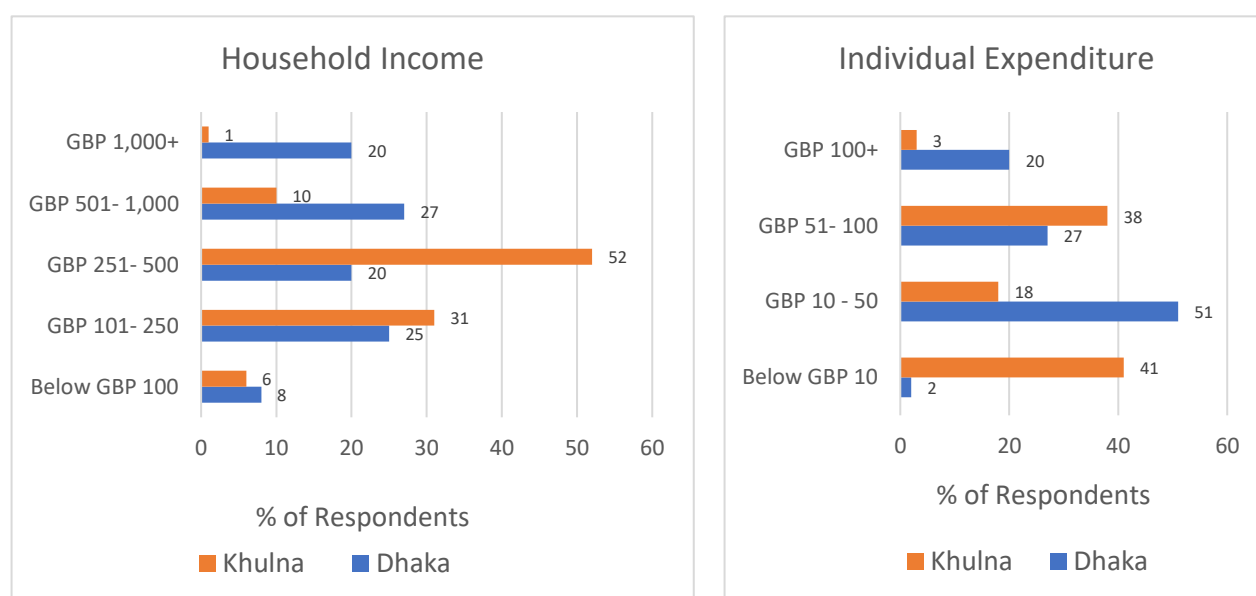


Table 3: Household vehicle ownership of respondents in Dhaka and Khulna city

Vehicle Ownership	Vehicle	Dhaka		Khulna	
		Number of Respondents	%	Respondents	%
No		180	72%	120	60
Yes	Car	47	18.7	12	6
	Motorcycle	11	4.3	41	20.5
	Bicycle	7	2.6	24	12
	Other*	6	2.4	3	1.5
	Sub-Total	71	28%	80	40%

* Other includes rikshaw and van.

Data on household monthly income shows that more than half of the respondents (52%) in Khulna are in the income group GBP 251-500, while in Dhaka the highest proportions are in monthly income groups GBP 100-250 (25%) and GBP 501-1000 (27%) (Figure 1). The personal expenditure per month for more than half of the respondents (51%) in Dhaka is in the range GBP 10-50, whilst in Khulna 41% spent below GBP 10 and 38% spent in the range GBP 51-100.



Table 3 shows the vehicle ownership of the households; in both cities most of the households do not own any private vehicles. Only 28% in Dhaka and 40% in Khulna mentioned that the household has a personal vehicle: a car for the majority in Dhaka but a motorcycle in Khulna. However, of the respondents having a household vehicle, around 24% of them in both cities do not have access to the vehicle (Appendix Figure E1-2). In many cases, only one member of the household uses the car (e.g. an office car from a carpool) which is not generally available for other members.

4.2 Mobility and trips during COVID-19 (post-lockdown)

This section provides information on the travel patterns and characteristics of trips during the COVID-19 post-lockdown period for both cities in Bangladesh.

4.2.1 Travel Pattern

Most of the respondents travel alone while 41% and 16% respectively in Dhaka and Khulna are accompanied or escorted by another person (Appendix Table E1-5). Of the accompanied persons, the majority are family members while a very few (12% and 6% respectively in Dhaka and Khulna) are neighbours or friends. The frequency of travel is shown in Table 4. A significant portion in Dhaka travel very rarely (e.g. a few times in a year or month) while a major portion in Khulna travel 2-3 times or 4-5 times per week. The respondents were asked if public transport is available for their trips and whether physical distancing and health precautions (e.g. hygiene or protective measures) are maintained in the vehicle. Almost 67% and 90% respectively in Dhaka and Khulna mentioned that public transport is available and in terms of physical distancing, 78% and 89% respectively mentioned it is maintained. Only 9% and 13% respectively in Dhaka and Khulna mentioned that they are facing travel problems such as: less travel; less availability of public transport where physical distancing is not properly maintained; and increased travel cost.

Table 4: Respondent's travel frequency in Dhaka and Khulna city during COVID-19 post-lockdown

Categories	Dhaka		Khulna	
	Number of Respondents	%	Number of Respondents	%
Travel Frequency				
None	2	1	2	1
Few times/ year	47	20	6	3
Few times/ month	25	10.5	8	4
1/ month	24	10	10	5
1/ week	27	11.5	24	12
2-3/ week	46	19.5	52	26
4-5/ week	28	11.5	83	41.5
5+/ week	34	14	12	6
Several times/ day	5	2	3	1.5
Total	238	100%	200	100%
Physical Distancing				
Yes	181	78%	179	89%
No	51	22%	21	11%
Availability of Public Transport				
Yes	140	66.5%	176	90%
No	70	33.5%	19	10%
Problems Due to COVID				
Yes	23	9%	26	13%



To get more detailed travel information, the respondents were asked about their total number of trips during the previous week. Table 5 shows that 45% of respondents in Dhaka and 17.5% in Khulna did not travel in the previous week, whilst almost 29% in both cities made 1-2 trips. However, in Khulna the highest frequency was 3-5 trips (41% of the respondents). Comparatively more respondents in Khulna had more trips probably because of the following reasons: there was not such a strong lockdown and enforcement as in Dhaka; and many motorcycles and easybikes were available for trips.

Table 5: Respondent's trips in Dhaka and Khulna city in the previous week

Travel Frequency of Respondents	Dhaka		Khulna		Total	
	Respondents	%	Respondents	%	Respondents	%
None	112	45	35	17.5	147	33
1-2/ week	71	28.5	59	29.5	130	29
3-5/ week	22	9	82	41	104	23
5+/ week	44	17.5	24	12	68	15
Total	249	100%	200	100%	449	100%

The details of trip characteristics are discussed in the next section.

4.2.2 Trip Characteristics

Table 6 delineates the characteristics of trips including purpose, distance, travel time, travel cost, and mode used during the COVID-19 post-lockdown period. The main purposes for the trips in both cities are: work; grocery or shopping; and visiting a doctor or purchasing medicine. In Khulna almost half of the trips are for work. The trips in both cities are mostly for short distances, within 5 km; a small portion of trips in Dhaka are for long distances such as 20 km or outside of the city.

Table 6: Trip characteristics in Dhaka and Khulna post- COVID-19 lockdown

Categories	Dhaka		Khulna	
	Number of Trips	%	Number of Trips	%
Trip Purpose				
Grocery	61	23.5	31	15
Personal Need	27	10.5	22	11
Doctor Visits	47	18	21	10.5
Work	54	21	99	49
Social	37	14	21	10
Recreation	18	7	0	0
Prayer	15	6	9	4.5
Total	259	100%	203	100%
Trip Distance				
Below 0.5 km	20	8	18	9
0.5 - 1 km	71	27.5	34	16.5
1.1 – 2 km	72	28	69	33
2.1 – 5 km	45	17	54	26
5.1 – 10 km	28	11	31	15
10.1 – 20 km	8	3	1	0.5
Above 20 km	4	1.5	0	0
Outside of the city	11	4	0	0



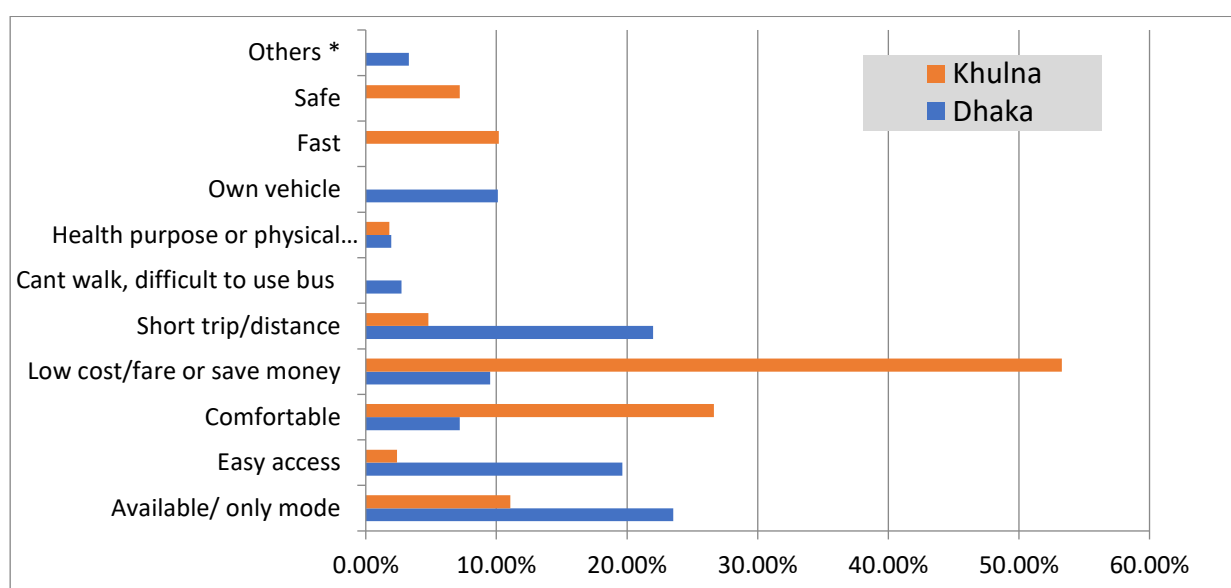
Categories	Dhaka		Khulna	
	Number of Trips	%	Number of Trips	%
Total	259	100%	207	100%
Travel Mode				
Walking	85	33	25	12
Wheelchair	1	0.5	1	0.5
Bicycle	1	0.5	10	5
Rickshaw	76	29	52	25
Bus	39	15	0	0
Car	36	14	9	4.5
Motorcycle, Pathao	2	1	19	9
CNG or easybike	13	5	90	43.5
Other	6	2	1	0.5
Total	259	100%	207	100%
Travel time				
Below 5 minutes	34	13	42	20
6 – 15 minutes	111	43	101	48.5
16 - 30 minutes	73	28	63	30.5
31 - 45 minutes	9	3.5	1	0.5
46 minutes - 1 hour	9	3.5	1	0.5
1 - 2 hour	12	4.5	0	0
2+ hours	11	4.5	0	0
Total	259	100%	207	100%
Trip Cost (BD Tk ³)				
None or Not Applicable	109	42	64	31
Below Tk 10	12	5	18	9
Tk 11 – 20	27	11	58	28
Tk 21 – 50	57	23	53	25
Tk 51 – 100	16	6	12	6
Tk 101 – 200	12	5	2	1
Tk 201 – 500	17	7	0	0
Tk 500+	2	1	0	0
Total	259	100%	207	100%

The travel time for most of the trips is less than 30 minutes although a small portion of trips in Dhaka require more than 1 hour. Travel time is related to the trip distance, mode used for the trip and the congestion level of city. The travel cost for a major portion of trips is not applicable as they involve walking or unknown due to the use of the respondent's own vehicle (with respondents not knowing the cost for a particular trip). Though the cost for the majority both in Dhaka and Khulna is within Tk 50 (GBP 0.45), a small portion in Dhaka is above Tk 100 (GBP 0.90), as seen in Table 6. The travel cost or fare is often high when they need to hire a vehicle for taxi-type individual use.

³ BDT is Bangladeshi currency Taka (Tk). In November 2020, the conversion rate of GB 1 Pound was BDT 110.



Figure 2: Reason for travel mode use, Dhaka and Khulna city during COVID-19



The travel modes of the respondents are different in Dhaka and Khulna: bus and car are significant in Dhaka, whilst easybike⁴, bicycle and motorcycle are significant in Khulna. A large portion of the respondents in both cities travel by walking and rickshaw. As seen in Figure 2, the main reasons for using a particular travel mode are: availability, easy access and short distance in Dhaka; and low cost, comfort, speed and safety in Khulna.

4.3 Mobility and trips during lockdown

This section provides information on the travel patterns of the respondents and the characteristics of their trips during lockdown.

4.3.1 Travel pattern

During lockdown most of the respondents lived in their own house. Only 7% and 4.5% respondents in Dhaka and Khulna respectively were in other places such as in their home village, another part of the city or another city before the lockdown; they returned home at the start of lockdown, travelled by bus or personal vehicle (Appendix Table E1-7). Most of the respondents (80.5% in Dhaka and 53% in Khulna) did not travel or go outside of their homes during lockdown. The travel frequencies are shown in Table 7 for the 19.5% in Dhaka and 47% in Khulna who did travel during lockdown. Probably because of the weak lockdown in Khulna a higher percentage travelled during the lockdown though it was mostly once or 2-3 times per week.

Table 7: Travel frequency of respondents, Dhaka and Khulna city during lockdown

Categories	Dhaka City		Khulna City	
	Number of Respondents	%	Number of Respondents	%
Travel Frequency				
None	203	80.5	102	53
Few times/ year	0	0	0	0
Few times/ month	5	2	5	2.5
1/ month	14	5.5	5	2.5
1/ week	12	5	24	12.5
2-3/ week	7	3	52	27
4-5/ week	1	0.5	0	0

⁴ Three-wheeler auto-rickshaws are called CNG. Easybikes are the battery-operated modified auto-rickshaws with carrying capacity 4-6 passengers (53).



Categories	Dhaka City		Khulna City	
	Number of Respondents	%	Number of Respondents	%
5+ / week	1	0.5	2	1
Several times/ day	6	2.5	3	1.5
TOTAL	249	100%	193	100%
Physical Distancing				
Yes	37	81%	84	90%
No	9	19%	9	10%
Availability of public transport				
Yes	18	40%	80	88%
No	28	60%	11	12%
Problems due to COVID-19				
Yes	2	3%	2	4%

Of the respondents who travelled during lockdown, as shown in Table 7 only 40% in Dhaka but 88% in Khulna mentioned that public transport was available for their trips. In terms of health measures and precautions, 81% and 90% respectively in Dhaka and Khulna mentioned that physical distancing was maintained in the vehicle and that they used a face mask during the trip. The high percentages are based upon a small number of responses, 46 and 91 respectively. Only 3% and 4% of the respondents in Dhaka and Khulna respectively mentioned that they had difficulties in finding a vehicle due to less transport being available and increased travel cost during lockdown.

4.3.2 Trip characteristics

Table 8 shows the characteristics of trips during lockdown, including purpose, distance, travel time, travel cost, and mode used. In Dhaka, the main purpose for travel during lockdown is purchasing grocery or shopping, while in Khulna it is work and pray (worship). Other purposes are insignificant; these are: visiting a doctor or health centre, social or visiting relatives/ friends, and own or personal reasons. The distance of trips during lockdown is short, more than half are below 1 km. During lockdown, most of the respondents in both cities walked for their trips. This is probably to maintain physical distancing and for avoiding crowds in public transport. The travel mode for a large portion in Khulna was CNG easybike, while bicycle and motorcycle are also significant.

Travel times during lockdown are mostly within 15 minutes in Dhaka and within 30 minutes in Khulna. Short travel times are mainly because of empty roads and also due to short distances. However, the travel times for some trips are 1-2 hours or even 2+ hours in Dhaka. Travel costs for the majority of the trips during lockdown are low and a significant portion have no cost as they involved walking, using a bicycle, or not known the trip cost as using their own (motorised) vehicle. However, a few trips had higher costs such as Tk 201-500 (GBP 2-5) or even over Tk 500 (GBP 5).

Table 8: Characteristics of trips, Dhaka and Khulna city during lockdown

Categories	Dhaka		Khulna	
	Number of Trips	%	Number of Trips	%
Trip Purpose				
Grocery	27	50	9	8
Personal Need	4	7.5	0	0
Doctor Visits	4	7.5	7	7
Work	8	15	51	46
Social	5	9	2	2



Categories	Dhaka		Khulna	
	Number of Trips	%	Number of Trips	%
Recreation	3	5.5	1	1
Prayer	3	5.5	39	36
TOTAL	54	100%	109	100%
Trip Distance				
Below 0.5 km	14	27	44	40.5
0.5 – 1 km	13	25	11	10
1.1 - 2 km	8	16	19	17.5
2.1 - 5 km	5	10	14	13
5.1 - 10 km	4	8	20	18
10.1 - 20 km	3	6	0	0
Outside of the city	4	8	1	1
TOTAL	51	100%	109	100%
Travel Mode				
Walking	31	61	47	43
Wheelchair	0	0	1	1
Bicycle	0	0	7	7
Rickshaw	5	10	8	7
Bus	7	13	0	0
Car	4	8	7	7
CNG or easybike	0	0	31	28
Motorcycle or pathao	0	0	7	7
Other	4	8	1	1
TOTAL	51	100%	109	100%
Travel time				
Below 5 minutes	10	19.5	53	49
6 - 15 minutes	21	41	27	24.5
16 - 30 minutes	9	17.5	27	24.5
31 - 45 minutes	4	8	1	1
45 minutes - 1 hour	0	0	0	0
1 - 2 hour	4	8	00	0
2+ hours	3	6	1	1
Total	51	100%	109	100%
Trip Cost				
None or Not Applicable	36	66.5	67	61
Below Tk 10	1	2	7	6.5
Tk 11 – 20	3	5.5	13	12
Tk 21 – 50	6	11	13	12
Tk 51 – 100	0	0	6	5.5
Tk 101 – 200	1	2	1	1
Tk 201 – 500	1	2	1	1



Categories	Dhaka		Khulna	
	Number of Trips	%	Number of Trips	%
Tk 500+	6	11	1	1
Total	54	100%	109	100%

As seen in Table 9, the main reasons for selecting or using a travel mode in Dhaka during lockdown are short distance (33%) and availability of the mode (25.5%); low cost or saving money are the dominant reasons (55%) in Khulna. The other reasons are: easy access, fast mode, and safe mode.

Table 9: Reason for travel mode, Dhaka and Khulna city during lockdown

Reason for Selecting Travel Mode	Dhaka City		Khulna City	
	Frequency	%	Frequency	%
Available/ only mode	13	25.5	3	3
Easy access	9	17.5	18	16.5
Comfortable	1	2	5	4.5
Low cost or save money	6	11.5	60	55
Short distance	17	33	0	0
Health purpose or fitness	1	2	0	0
Own vehicle	1	2	0	0
Safe	0	0	12	11
Fast	0	0	11	10
Others *	3	6	0	0
Total	51	100%	109	100%

* Others included carrying goods and emergency travel needs.

4.4 Mobility and trips before COVID-19

This section provides travel information of the respondents from Dhaka city and Khulna city of Bangladesh before COVID-19.

4.4.1 Travel pattern

Before COVID-19, the frequencies of trips (or going outside of home) are shown in Table 10. The majority in both cities made 2-3 trips, 4-5 trips or 5+ trips per week.

Table 10: Respondent's frequency of trips, Dhaka and Khulna city before COVID-19

Travel Frequency of Respondents	Dhaka City		Khulna City	
	Respondents	%	Respondents	%
Few times/ year	38	16	3	1.52
Few times/ month	25	10.5	3	1.52
1/ month	10	4	6	3.03
1/ week	17	7	11	5.56
2-3/ week	42	18	59	29.80
4-5/ week	31	13.5	84	42.42
5+/ week	65	27.5	25	12.63
Several times/ day	8	3.5	7	3.54



Travel Frequency of Respondents	Dhaka City		Khulna City	
	Respondents	%	Respondents	%
Total	236	100	198	100
Availability of public Transport				
Yes	158	63%	181	91%
No	93	37%	19	9%
Travel problems				
Yes	33	13%	15	7%

Almost 63% and 91% of the respondents in Dhaka and Khulna respectively mentioned that before COVID-19 there was public transport available for their trips. About 13% and 7% respondents in Dhaka and Khulna respectively mentioned that they faced problems before COVID-19 due to: traffic jams; poor road conditions; lack of sidewalks or crossing facilities (particularly for the disabled); and overcrowding and non-accessible public transport (for both elderly and disabled). Most of the respondents, both in Dhaka and Khulna (75.5% and 95% respectively), made two trips in a typical day before COVID-19 (see in Appendix Table E1-8). The characteristics of the trips are discussed in the next section.

4.4.2 Trip characteristics

Table 11 describes the characteristics of the trips including purpose, distance, travel time, travel cost and mode used before COVID-19. Trips for most of the respondents (before COVID-19, both in Dhaka and Khulna) were for the purposes of work, shopping, social or recreation. Trip distances for the majority in both cities are concentrated within 5 km. Travel time for most of the trips is within 30 minutes in both cities, although a number of respondents in Dhaka mentioned 1 hour or 2+ hour.

Table 11: Trip characteristics, Dhaka and Khulna city before COVID-19

Categories	Dhaka		Khulna	
	Number of Trips	%	Number of Trips	%
Trip Purpose				
Grocery	68	24	28	13.5
Personal Need	27	9.5	25	12
Doctor visits	36	13	20	10
Work	68	24	102	50
Social	50	17.5	22	10.5
Recreation	26	9	0	0
Prayer	8	3	8	4
Total	283	100%	205	100%
Trip Distance				
Below 0.5	35	12.87	11	5.21
0.5-1 km	71	26.10	29	13.74
1.1 – 2 km	64	23.53	57	27.01
2.1 – 5 km	50	18.38	74	35.07
5.1 – 10 km	22	8.09	38	18.01
10.1 – 20 km	19	6.99	1	0.47
Above 20 km	3	1.10	1	0.47
Outside of the city	8	2.94	0	0.00

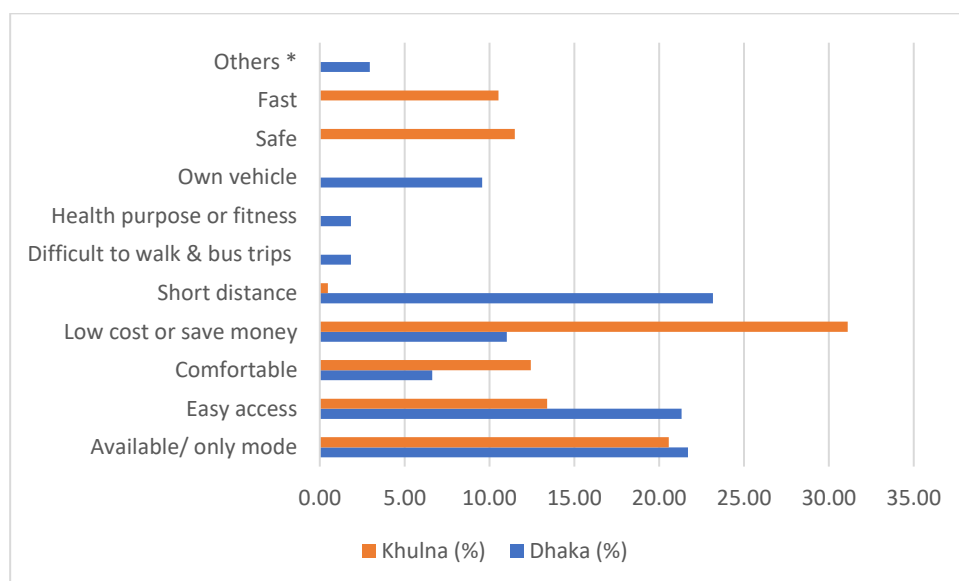


Categories	Dhaka		Khulna	
	Number of Trips	%	Number of Trips	%
Total	272	100%	211	100%
Travel Mode				
Walking	94	35	15	7
Wheelchair	2	1	1	0.5
Bicycle	1	0.5	14	7
Rickshaw	70	26	49	23
Bus	43	16	1	0.5
Car	35	13	13	6
Motorcycle or Pathao	1	0.5	26	12
Taxi or Uber	2	1	00	0
CNG or Easybike	14	5	90	43
Others including tempo, laguna, maxi	8	3	2	1
Total	270	100%	211	100%
Travel time				
Below 5 minutes	39	14.5	31	15
6 – 15 minutes	117	43	110	52
16 - 30 minutes	63	23	62	29
31 - 45 minutes	16	6	8	4
46 minutes - 1 hour	11	4	0	0
1 - 2 hour	20	7.5	0	0
2+ hours	6	2	0	0
Total	272	100%	211	100%
Trip Cost				
None or Not Applicable	130	48	66	31.5
Below Tk 10	12	4.5	15	7
Tk 11 – 20	35	13	55	26
Tk 21 – 50	49	18	58	27.5
Tk 51 – 100	16	6	15	7
Tk 101 – 200	9	3.5	2	1
Tk 201 – 500	17	6	0	0
Tk 500+	2	1	0	0
Total	270	100%	211	100%

The amount of travel by rickshaw and on foot is high in both cities. However, particularly in Khulna, there is a very high portion of trips using CNG easybikes, bicycles and motorcycles. Short distance, easy access, and availability are the main reasons to choosing a travel mode for the majority in Dhaka, while low cost and availability are important in Khulna, as seen in Figure 3.



Figure 3: Reason for travel mode, Dhaka and Khulna city before COVID-19



4.5 Changes and difficulties due to COVID-19

4.5.1 Impacts of COVID-19 on mobility and travel

Only 18% and 30% of the respondents from Dhaka and Khulna respectively mentioned that their typical travel behaviour and mobility have changed due to COVID-19 (Appendix Table E1-9). Their reported main changes are:

- Less travel and movement in order to remain safe, avoiding unnecessary trips;
- No travel outside of home due to fear of COVID-19 or health problems;
- Changed travel mode - avoiding public transport by hiring a taxi-type individual use of easybike, by walking or by switching to personal vehicles;
- No travelling alone.

Only 18.5% of the respondents in Dhaka, but 72% in Khulna, mentioned that their trip cost has changed, mostly increased, due to COVID-19 (Table E1-10). This is mainly because most people who used shared or public transport mode have shifted to individual or reserved mode of transport. Trip costs decreased for a small portion who shifted to walking.

The occupations of only a few respondents, 7% in Dhaka and 3.5% in Khulna, have changed after COVID-19 (Table E1-11). It is not surprising to find changes for a very small portion because most of the respondents, who are elderly and physically challenged persons, were not working before COVID-19. The major changes in occupation are: loss of job (unemployed); change or shift in job pattern or profession (or business). Nevertheless, more than half of the respondents (60% both in Dhaka and Khulna) mentioned that their household income has decreased after COVID-19 (Figure 4).

Figure 4: Changes in household income, Dhaka and Khulna city due to COVID-19

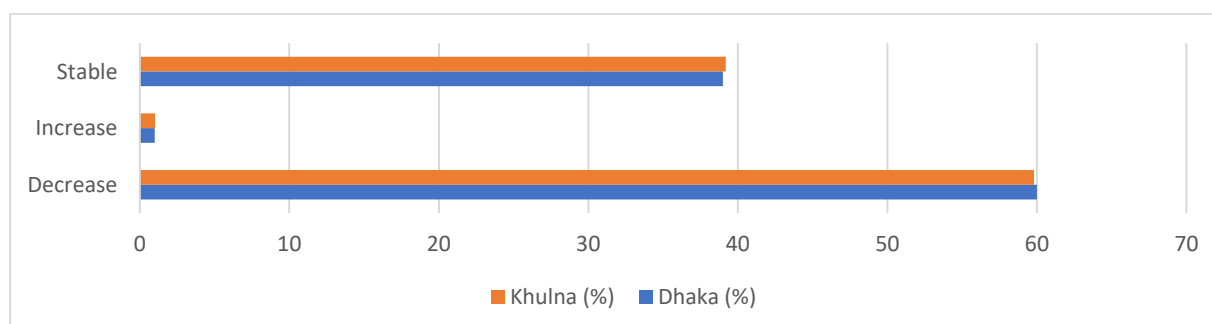
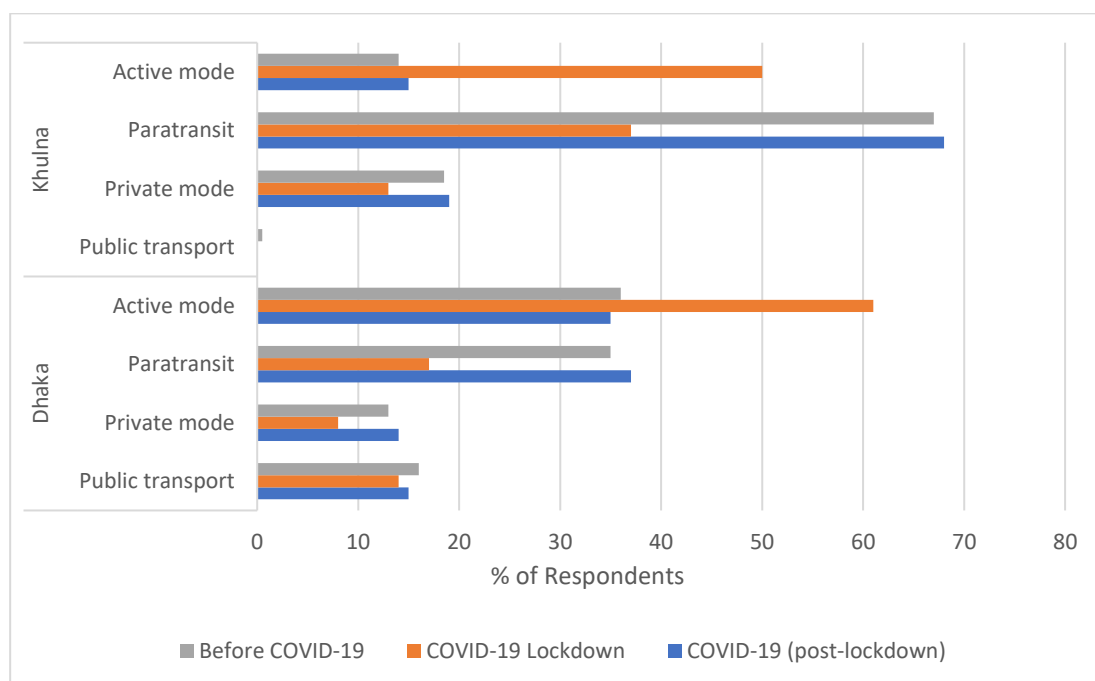




Figure 5: Modal distribution of trips, Dhaka and Khulna city during and before COVID-19



The proportion of active modes significantly increased during lockdown in both cities, while use of all other modes reduced, as seen in Figure 5. Though the proportion of the modes during post-lockdown and before COVID-19 are similar, a slight increase of paratransit and private modes is observed in both cities during post-lockdown, with a slight decrease of public transport in Dhaka during post-lockdown.

The major portion of the respondents travelled 2-3 trips or 4-5 trips or 5+ trips per week in both cities before COVID-19, though there are many respondents in Dhaka who travelled just a few times in a year or month, as seen in Figure 6. During post-lockdown a similar pattern was found, but with a slightly decreased percentage; the proportion making 5+ trips per week reduced but the proportion making 1 trip per week increased. During lockdown, the majority did not travel while a few travelled a trip per month or week.

Figure 6: Respondent's travel frequency, Dhaka and Khulna city during and before COVID-19

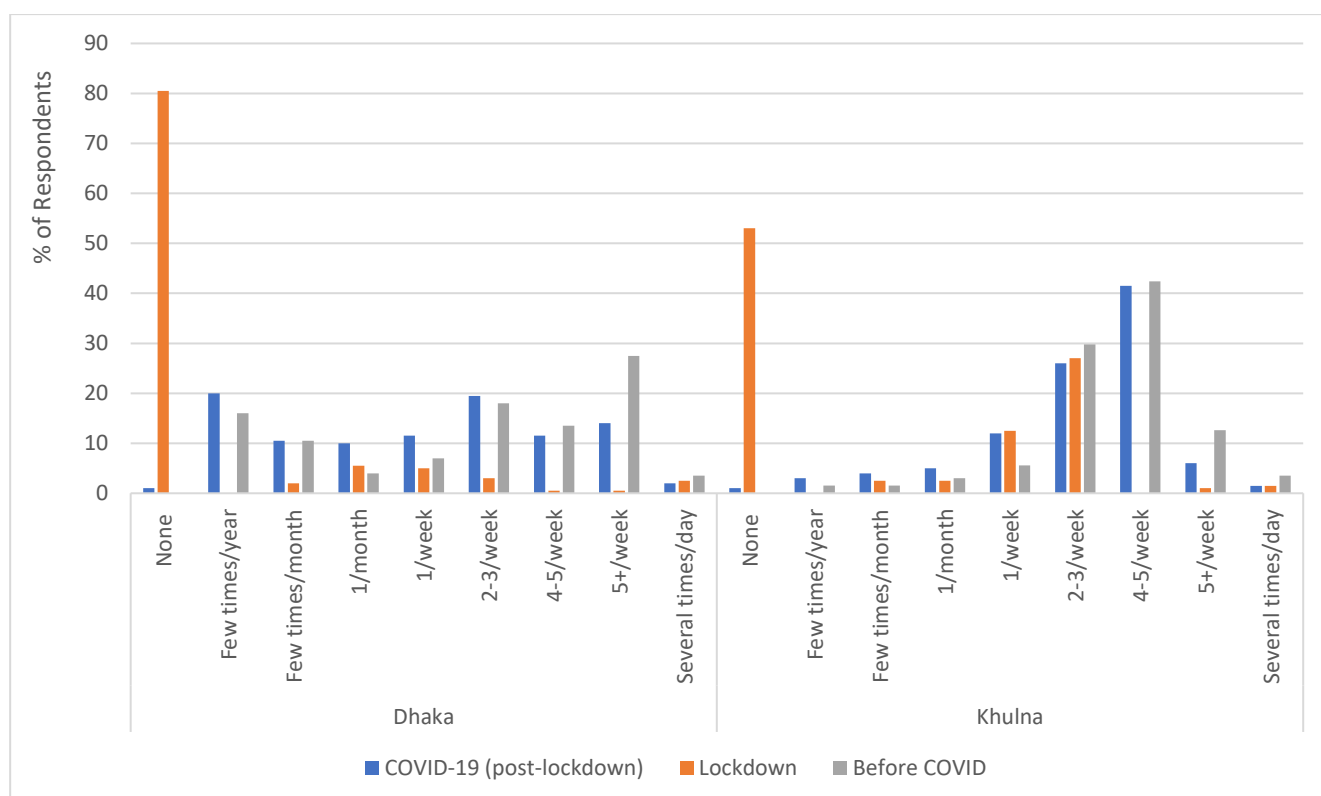




Figure 7: Respondent's travel purpose, Dhaka and Khulna city during and before COVID-19

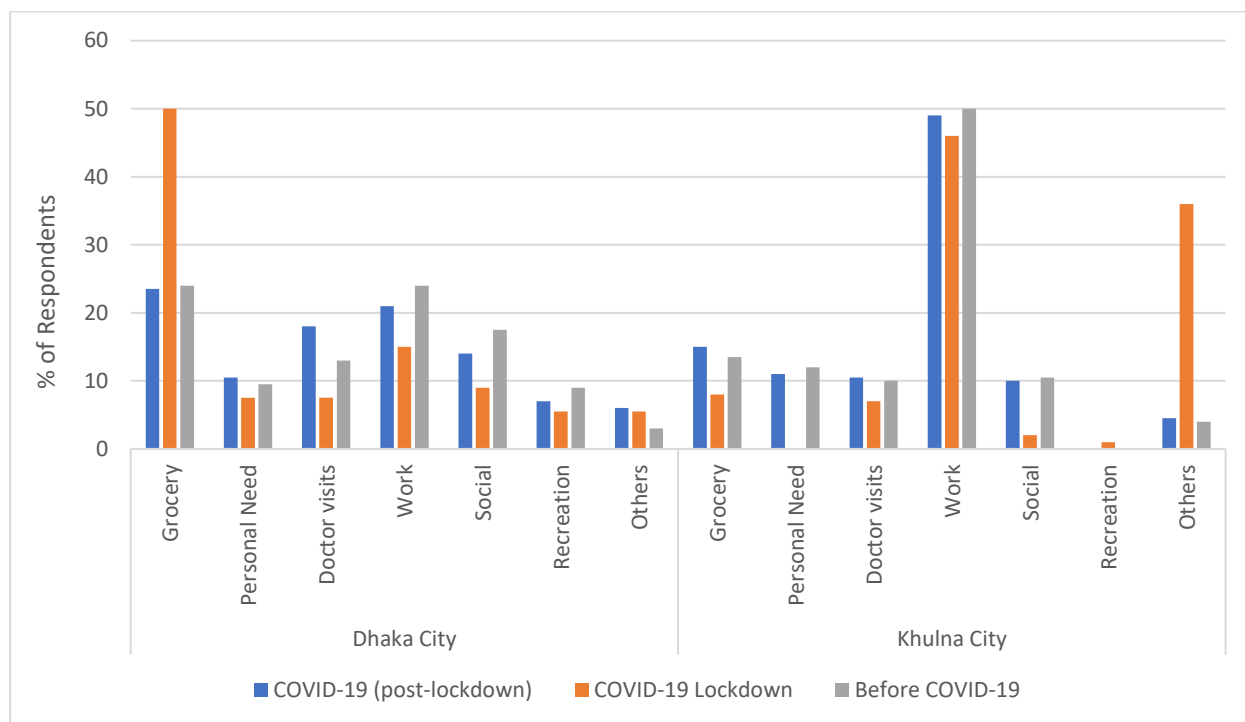


Figure 7 depicts the purpose of trips; during lockdown about half the trips in Dhaka are for grocery whilst in Khulna about half are for work. Social trips and recreation trips reduced. Trip purposes before COVID-19 and post-lockdown are similar but slightly less during post-lockdown, except for doctor visits which increased.

4.5.2 Difficulties and expectations

In general, finding and riding on public transport in Dhaka are not easy. Whilst almost 40% of respondents mentioned that public transport was 'manageable', the remaining (approx.) 60% said that they found it 'difficult' or 'very difficult'. In contrast, almost 80% in Khulna mentioned that it is 'easy' while the remainder said they found it very easy or manageable. Similarly, in terms of easiness in finding or navigating a location, all the respondents mentioned that it was easy or manageable in Khulna, while in Dhaka more than half mentioned 'difficult' or 'very difficult'.

Figure 8: Difficulty of finding public transport mode, Dhaka and Khulna city

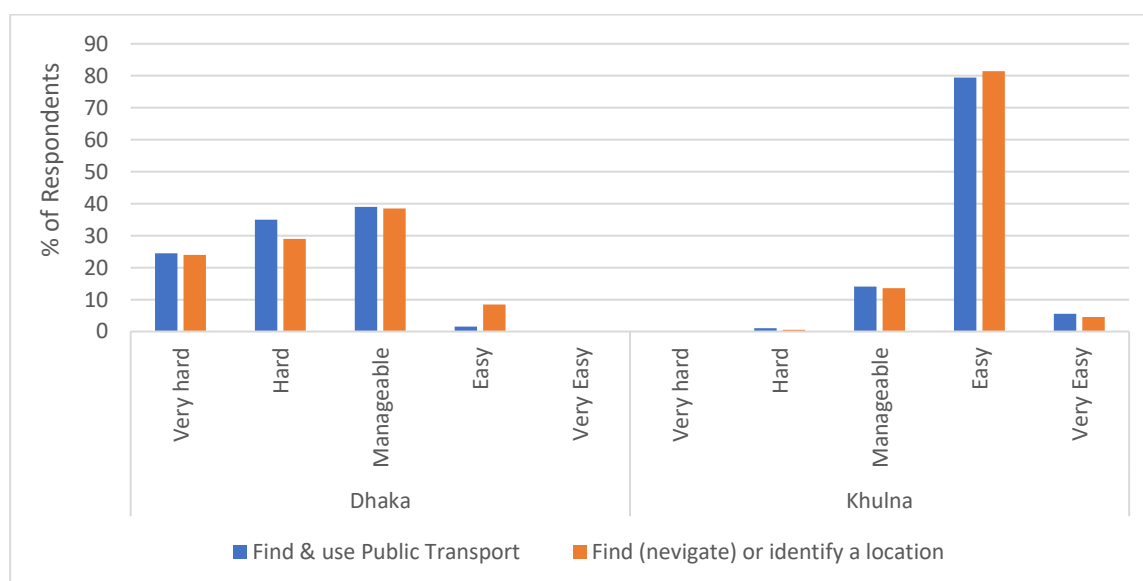
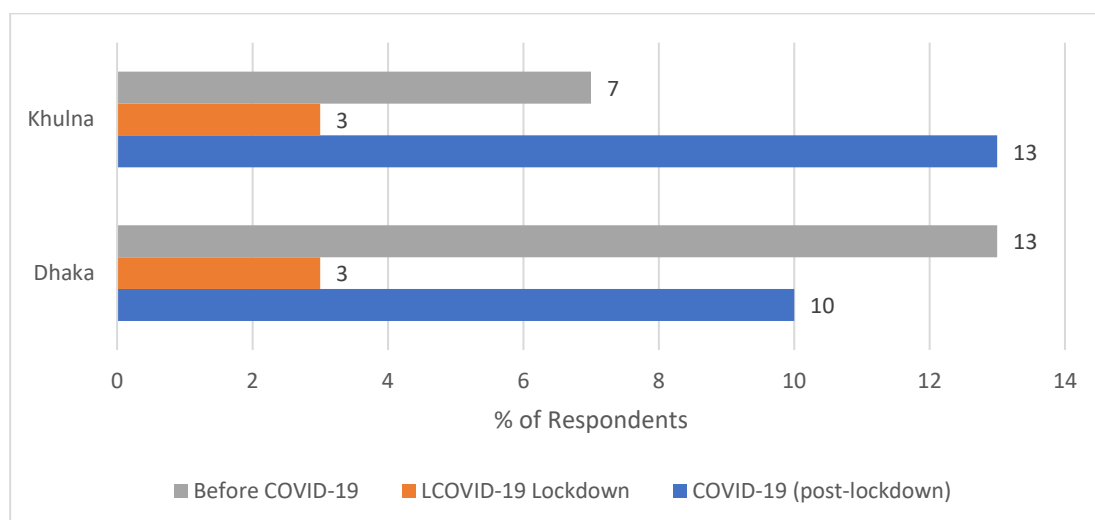




Figure 9: Proportion of respondents facing travel issues, Dhaka and Khulna city



The respondents were asked if they have faced any difficulties related to travel and mobility during and before COVID-19. Only 13% and 7% respectively in Dhaka and Khulna faced a travel difficulty before COVID-19, compared to 10% and 13% respectively during COVID-19 post-lockdown, as seen in Figure 9. During lockdown, the figure is very low, only 3%, in both cities because most of the respondents did not travel and stayed at home. Nevertheless, the respondents were asked if they have any new or additional difficulties for mobility due to COVID-19. Only 3% in Dhaka and 17% in Khulna mentioned that they feel additional difficulties due to COVID-19, which are: less public transport vehicles are available, increased travel cost or bus fare, fear of going out and cannot travel on public transport, uncomfortable or breathing problems because of wearing a mask (Appendix Table E1-12). Those who do not feel any additional travel difficulties due to COVID-19, of them only 5.5% in Dhaka but 57% in Khulna mentioned that the magnitude of the problem is now higher than that of before COVID-19 (Table E1-12). The reported difficulties in both cities are similar. The difficulties before COVID-19 are:

- Mobility problems due to disability, difficulty to walk and cannot travel alone;
- Buses remain overcrowded and no access, difficult to board/ alight;
- No transport facilities for disabled people and no sidewalk or crossroad is provided;
- Poor road condition and traffic jam.

In addition to the difficulties which were before COVID-19, some additional difficulties caused due to COVID-19. During COVID-19 the added difficulties are:

- Increased travel cost (bus fare, easybike fare);
- Limited amount of public transport (e.g. buses) and rickshaws are available;
- Lack of safe transport facility; avoided easybike trips due to COVID-19 and fear.
- Physical distancing is not adhered to in many public transport vehicles and not everyone is aware about it;
- Breathing problem or uncomfortable for wearing mask;
- Fear of travel or afraid of going out due to COVID-19;
- Less travel – avoid unnecessary trip (particularly for shopping or recreation);

Interestingly a high number of respondents (more than 90% in Dhaka and more than 40% in Khulna) did not experience any difference in their commuting or daily travel. This has a multi-faceted interpretation. Firstly, during COVID-19 the government imposed a range of regulatory measures which reduced the number of vehicles. Moreover, demand for transport remained almost same but the number of passengers allowed to be carried in each public transport vehicle reduced significantly. Secondly, a high share of the elderly population does not use public transport. So for them, COVID-19 has not changed their travel costs in any way. However, for many people COVID-19 has caused a variety of challenges for their everyday essential travel.



Nevertheless, the respondents were asked if they have any expectation or suggestion for improving travel and mobility. Only 17% in Dhaka and 22% in Khulna provided their suggestions for the period during COVID-19. These are:

- Mass awareness generation to avoid unnecessary trips;
- Strictly following the health guidelines (e.g. maintain physical distancing, wearing face mask, gloves use, disinfecting vehicles and terminals);
- Limited passengers in public transport to ensure physical distancing;
- More vehicles to be available in roads or increased number of buses with safety measures;
- Providing ample walking space and parks for older people.
- Maintaining physical distancing by carrying less passengers or by having a new type of auto rickshaw design.

Beside these, the respondents mentioned that some measures should be taken to improve the overall mobility and access of elderly and disabled people even when the COVID-19 pandemic has finished. These are:

- Improved public transport accessibility for elderly and disabled people;
- Wheelchair access to public transport and built environment, considering special needs;
- Reserved seats for disabled and elderly people;
- Improved adherence by everyone to traffic rules and regulations;
- Reduced fare rates for the poor and disabled people;
- Improved road network with sidewalks, provision of separate lanes for wheelchair users
- Reduced congestion;
- Specified easybike stops for passenger pick-up points;
- More walkways to accommodate all types of pedestrians;
- A plan for sustainable transport focusing on poor and middle-income groups.



5. Findings from Pakistan

This chapter reports on data derived from Karachi and Lahore city of Pakistan. The data was collected from a household survey in various locations covering different socio-economic and spatial distributions in both cities. Totals of 209 and 237 respondents from Karachi and Lahore respectively were interviewed. An online survey received 88 responses, of which 77 were from Karachi, 5 were from Lahore, 3 from other cities and 3 from rural areas.

5.1 Socio-economic profile of the respondents

Many respondents are in the age group of 61-70 with smaller numbers in other groups. A detailed socio-economic profile of the respondents is available in Appendix E2. The highest proportion of the disabilities covered in the data concern knee/ joint pain because a large amount of data is obtained from the older people, and it is the most common problem for elders. Of the respondents, 57% in Karachi and 62% in Lahore do their daily needs themselves while 43% and 38% respectively are dependent on family members or relatives, as seen in Appendix Table E2-2. Only a small percentage of respondents (0.5%) in Karachi but none in Lahore live alone (Appendix Table E2-3). In Karachi, 42% of the respondents are from households consisting of 4-5 members, whereas 50% in Lahore belong to households comprising of 6-8 members.

Figure 10 depicts the monthly household income distribution, showing that a highest proportions of respondents in Karachi are in the income groups GBP 251-500 and 100-250 while in Lahore it is in the income groups GBP 100-250 and below GBP 100 per month. A large proportion of the respondents in both cities have a range of individual expenditure between GBP 10-50 per month for personal use. The data in Appendix Figure E2-4 shows that in Karachi around 33% of the respondents are retired while in Lahore a high proportion of respondents are workers or day-labours (39%) and unemployed (25%).

Figure 10: Respondent's monthly household income and personal expenditure, Karachi and Lahore city

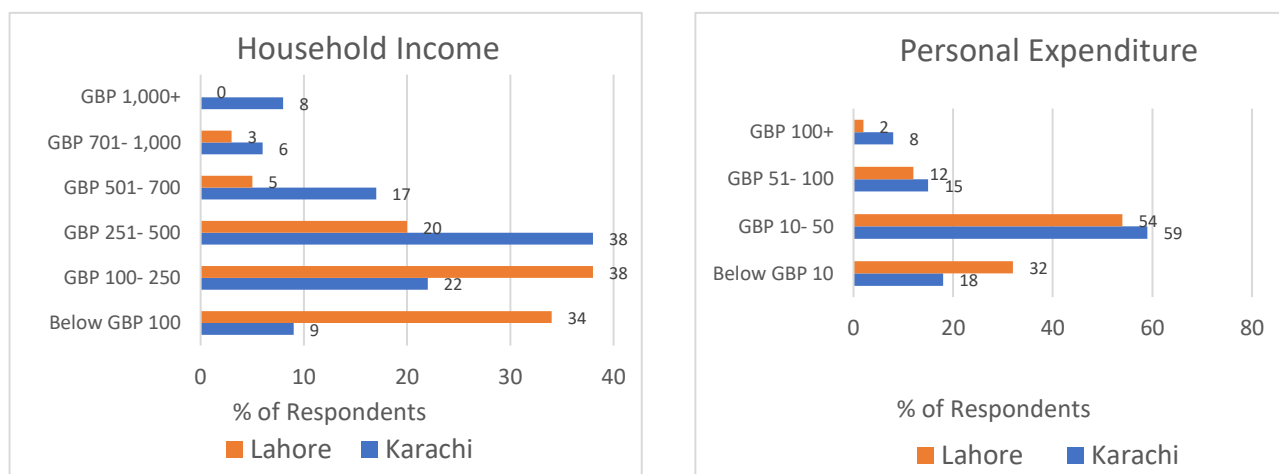


Table 12 shows the vehicle ownership of the households; in both cities more than half of the households own private vehicles. Ownership of private vehicles is significantly higher in Karachi (82%) as compared to Lahore (58%). This is probably due to public transport facilities in Lahore having been improved after the Metrobus system and Orange Line initiatives, which provides residents with better public transport (even during the pandemic). These private vehicles consist of cars and motorcycles, with proportions of 46% and 36% respectively for Karachi and 27% and 31% for Lahore. Nevertheless, almost 11% of the respondents in Karachi never have access to the private vehicle owned by the household (in Appendix Table E2-3).



Table 12: Respondent's household vehicle ownership, Karachi and Lahore city

Vehicle Ownership	Vehicle	Karachi		Lahore	
		Number of Respondents	%	Respondents	%
No		37	18%	98	42%
Yes	Car	96	46	65	27
	Motorcycle	76	36	74	31
	Sub-Total	172	82%	139	58%

5.2 Mobility and trips during COVID-19 (post-lockdown)

5.2.1 Travel pattern

Almost half of the respondents travel alone though 48% in Karachi and 52% in Lahore travel accompanied by another person. Table 13 describes the travel patterns of the respondents during COVID-19. In Karachi, a smooth variation can be observed in the travel frequency of respondents, with around 20% of the respondents making trips with a high frequency, i.e. more than 5 trips per week. In Lahore, 50% of the respondents made trips with a frequency of 4-5 trips per week. Physical distancing and Standard Operating Procedures (SOPs) were followed by 74% of the respondents in Karachi, 5% more than in Lahore (69%). The major problems considered in travelling during the post-lockdown period, mentioned by 18% and 10% respondents from Karachi and Lahore respectively, include less travel, less availability of public transport and no proper enforcement of social distancing and SOPs.

Table 13: Respondent's travel frequency, Karachi and Lahore during COVID-19 post-lockdown

Categories	Karachi		Lahore	
	Number of Respondents	%	Number of Respondents	%
Travel Frequency				
Few times/ year	25	12%	2	1%
Few times/ month	20	10%	5	2.5%
1 trip/ month	8	4%	2	1%
1 trip/ week	22	11%	52	24%
2-3 trips/ week	24	11%	46	21.5%
4-5 trips/ week	34	16%	108	50%
5+/ week	41	20%	0	0
Several times/ day	35	17%	0	0
Total	209	100%	215	100%
Physical Distancing				
Yes	134	74%	148	69%
No	48	26%	66	31%
Availability of Public Transport				
Yes	79	87%	100	69%
No	12	13%	45	31%
Problems Due to COVID				
Yes	38	18%	22	10%

To understand more detailed travel information, the respondents were questioned on their total number of trips during the previous week. As seen in Table 14, in Karachi the highest travel frequency was 1-2 trips per



week, made by 44% of respondents. In Lahore about 41% respondents made 5+ trips per week while a very small portion did not travel at all. The latter respondents usually travel just a few times per month or year.

Table 14: Respondents' trips, Karachi and Lahore city, in the previous week

Travel Frequency of Respondents	Karachi		Lahore	
	Respondents	%	Respondents	%
None	44	21%	14	7%
1-2/ week	91	44%	75	35%
3-5/ week	30	15%	36	17%
5+/ week	40	20%	88	41%
Total	205	100%	213	100%

The details of trip characteristics are discussed in the next section.

5.2.2 Trip characteristics

Table 15 delineates the characteristics of trips including purpose, distance, travel time, travel cost, and mode used during COVID-19 (post-lockdown). In Karachi, main purpose of the trips was for work and shopping. Around 42% of the trips are travelled below 1 km distance, thus showing that elderly people usually make trips within the area close to home. The three major travel modes used for commuting in Karachi during COVID-19 (post-lockdown) were car, motorcycle and walking, with percentages of 28%, 21%, and 28% respectively. It shows that the most reliable and safe mode for people are private vehicles. Public transport was risky for elderly people, due to the potential contraction of coronavirus due to less enforcement of proper SOPs and physical distancing when travelling by buses and Chingchies⁵.

In Lahore, around 59% and 24% of trips were made with the major purposes of work and doctor visits, respectively. Around 46% of trips are between 2–10 kms in distance. The major travel modes used for commuting in Lahore during COVID-19 (post-lockdown) are rickshaw, motorcycle, and walking with percentages of 32%, 24%, and 19% respectively. The distance travelled for making most of the trips ranged from 1 to 10 km. The most preferred modes of transport were rickshaws, walking and private vehicles (car and motorcycle) with percentages 32%, 19%, and 40% respectively (seen in Table 15). Travel cost for most respondents in both cities during COVID-19 post-lockdown is between PKR⁶ 20 (GBP 0.1) and PKR 200 (GBP 1).

Table 15: Trip characteristics, Karachi and Lahore during COVID-19 post-lockdown

Categories	Karachi		Lahore	
	Number of Trips	%	Number of Trips	%
Trip Purpose				
Grocery	44	19%	19	8%
Personal Need	37	16%	1	0%
Doctor Visits	18	8%	55	24%
Work	65	28%	138	59%
Education	21	9%	4	2%
Social	37	16%	9	4%
Recreation	13	6%	7	3%
Total	235	100%	233	100%
Trip Distance				
Below 0.5 km	47	20%	20	8%

⁵ Chingchi is a three-wheeler public transport having low capacity: maximum 11 passengers (54).

⁶ PKR is the Pakistani currency. In November 2020, the conversion rate of 1 GB Pound was PKR 218 (Ltd, 2020).



Categories	Karachi		Lahore	
	Number of Trips	%	Number of Trips	%
0.5 - 1 km	51	22%	26	11%
1.1 – 2 km	21	9%	25	11%
2.1 – 5 km	31	13%	62	26%
5.1 – 10 km	38	16%	47	20%
10.1 – 20 km	28	12%	35	15%
Above 20 km	19	8%	23	10%
Total	235	100%	238	100%
Travel Mode				
Walking	66	28%	44	19%
Rickshaw	22	9%	75	32%
Bus	15	6%	19	8%
Car	66	28%	36	16%
Motorcycle	50	21%	56	24%
Chingchi	8	3%	2	1%
Taxi, Uber/ Careem ⁷	6	3%	0	0%
Total	233	100%	232	100%
Travel time				
Below 5 minutes	58	25%	13	5%
6 – 15 minutes	85	36%	60	25%
16-30 minutes	47	20%	106	45%
31-45 minutes	21	9%	21	9%
46 minutes -1 hour	12	5%	27	11%
1 - 2 hour	9	4%	8	3%
2+ hours	3	1%	2	1%
Total	235	100%	237	100%
Trip Cost				
None	70	30%	48	20%
PKR 10	4	2%	0	0%
PKR 11 – 20	14	6%	7	3%
PKR 21 – 50	42	18%	56	24%
PKR 51 – 100	41	17%	52	22%
PKR 101 – 200	37	16%	35	15%
PKR 201 – 500	23	10%	26	11%
PKR 500+	4	2%	14	6%
Total	235	100%	238	100%

⁷ Careem is an e-hiring taxi service used in Pakistan as a paratransit mode (<https://www.careem.com/>)



5.3 Mobility and trips during lockdown

5.3.1 Travel pattern

During lockdown most of the respondents lived in their own house. However, a very few (7% and 5% respectively in Karachi and Lahore) were in other places (e.g. village, other city) before the lockdown and they returned home by airplane, bus and personal vehicle during lockdown. Table 16 describes the travel patterns of the respondents during the lockdown in Karachi and Lahore. A high percentage of the respondents, about 70% and 53% in Karachi and Lahore respectively, avoided travel during the lockdown and preferred to stay at home. In Karachi, the highest frequency for those that travelled (9%) was 4-5 trips per week, while in Lahore around 25.5% made one trip per week. Of the respondents who made trips during the lockdown, 76% in Karachi and 69% in Lahore followed the SOPs. Almost 44% in Karachi mentioned having problems regarding travel and mobility, including unavailability of public transport and no proper physical distancing maintained in public places. In Lahore only 11% of respondents had problems with mobility: such problems were because of the closure of various roads and because public transport and paratransit were difficult to reach.

Table 16: Respondent's travel frequency, Karachi and Lahore city during lockdown

Categories	Karachi		Lahore	
	Number of Respondents	%	Number of Respondents	%
Travel Frequency				
No travel	146	70%	126	53%
Few times/ month	5	2%	1	0.5%
1 trip/ month	7	3.5%	1	0.5%
1 trip/ week	6	3%	60	25.5%
2-3 trips/ week	15	7%	15	6.5%
4-5 trips/ week	18	9%	18	7.5%
5+ / week	11	5%	12	5%
Several times/ day	1	0.5%	2	1%
Total	209	100%	235	100%
Physical Distancing				
Yes	47	76%	77	69%
No	15	24%	34	31%
Availability of public transport				
Yes	32	52%	44	40%
No	30	48%	66	60%
Travel problems				
Yes	27	44%	12	11%

5.3.2 Trip characteristics

Table 17 describes the characteristics of the trips including purpose, distance, travel time, travel cost, and mode used during lockdown. In Karachi, the main purposes of trips were those considered necessary, i.e. work, grocery, and personal needs. On the other hand, leisure trips, i.e. social gatherings and recreational trips, were avoided to remain safe from being infected. Around 65% of the trips were within the distance of 5 km. The three major travel modes used for commuting in Karachi during lockdown were car, walking, and motorcycle, with percentages of 29%, 26%, and 19% respectively. The priority in terms of travel mode is given to private vehicles as compared to public transport due to its unavailability during lockdown.

Whereas in Lahore, around 40% and 42% of trips were for the purpose of work and doctor visits, respectively. Around 74% of the trips were within the distance of 5 km. The major travel modes used for commuting in Lahore during lockdown are walking, rickshaw, and motorcycle with a percentage of 31%, 28%, and 21%



respectively. The most preferred mode of transport was walking, rickshaw, and motorcycle with percentage of 31%, 28%, and 21% respectively. The travel cost during lockdown was between PKR 21-50 (GBP 0.1-0.25) and PKR 51-100 (GBP 0.25-0.45) for 18% and 15% respectively.

Table 17: Trip characteristics, Karachi and Lahore city during lockdown

Categories	Karachi		Lahore	
	Number of Trips	%	Number of Trips	%
Trip Purpose				
Grocery	16	25%	13	12%
Personal Need	13	21%	1	1%
Doctor visits	6	10%	45	42%
Work	22	35%	43	40%
Education	0	0%	0	0%
Social	4	6%	0	0%
Recreation	2	3%	6	6%
Total	63	100%	108	100%
Trip Distance				
Below 0.5 km	10	16%	8	7%
0.5 - 1 km	11	18%	12	11%
1.1 – 2 km	9	15%	26	24%
2.1 – 5 km	10	16%	35	32%
5.1 – 10 km	7	11%	17	15%
10.1 – 20 km	8	13%	9	8%
Above 20 km	7	11%	3	3%
Total	62	100%	110	100%
Travel Mode				
Walking	16	26%	34	31%
Rickshaw	8	13%	30	28%
Bus	5	8%	2	2%
Car	18	29%	20	18%
Motorcycle	12	19%	23	21%
Qunichi	2	3%	0	0%
Taxi, Uber/ Careem	1	2%	0	0%
Total	62	100%	109	100%
Travel time				
Below 5 minutes	12	19%	6	5%
6 – 15 minutes	23	37%	45	41%
16 - 30 minutes	13	21%	39	35%
31 - 45 minutes	7	11%	12	11%
46 minutes - 1 hour	1	2%	6	5%
1 - 2 hours	5	8%	2	2%
2+ hours	1	2%	0	0%
Total	62	100%	110	100%



Categories	Karachi		Lahore	
	Number of Trips	%	Number of Trips	%
Trip Cost				
None	17	27%	37	34%
PKR 10	1	2%	0	0%
PKR 11 – 20	6	10%	3	3%
PKR 21 – 50	9	14%	20	18%
PKR 51 – 100	10	16%	17	15%
PKR 101 – 200	10	16%	15	14%
PKR 201 – 500	8	13%	14	13%
PKR 500+	2	3%	4	4%
Total	63	100%	110	100%

5.4 Mobility and trips before COVID-19

5.4.1 Travel pattern

Before COVID-19, around 51% and 57% of the respondents in Karachi and Lahore respectively travelled alone while the remainder were accompanied or escorted by another person. Table 18 describes the travel frequency of the respondents before the COVID-19 pandemic. Most of the respondents in Karachi made either more than 5 trips per week (21%) or several times per day (25%), though some travelled only once in a week or month or several times per year. Whereas in Lahore most respondents (99%) did not travel several times daily, the most common frequencies were 4-5 trips per week (39%) and more than 5 trips per week (25%).

Table 18: Respondent's travel frequency, Karachi and Lahore city before COVID-19

Categories	Karachi		Lahore	
	Number of Respondents	%	Number of Respondents	%
Travel Frequency				
Few times/ year	19	9%	2	2%
Few times/ month	13	6%	9	8%
1 trip/ month	8	4%	2	2%
1 trip/ week	15	7%	8	7%
2-3 trips/ week	23	11%	19	17%
4-5 trips/ week	34	16%	44	39%
5+/ week	43	21%	29	25%
Several times/ day	53	25%	1	1%
Total	208	100	114	100
Availability of Public Transport				
Yes	152	73%	46	40%
Transport Problems				
Yes	81	39%	44	39%

Almost 73% of the respondents in Karachi and 40% in Lahore mentioned that before COVID-19 there was public transport availability for their trips. Only 39% of respondents in both cities encountered travel and mobility problems. The main problems were: traffic congestion, pollution, overcrowded buses, high travel costs of fuel, lack of accessibility to bus stops, improper lighting systems on roads (causing crimes), lack of



pedestrian facilities, lack of parking spaces, and lack of enforcement of traffic rules. Almost 50% of the respondents in both cities mentioned that on a typical day before COVID-19 they usually travelled or went outside their home once per day (see in Appendix Table E2-4). The characteristics of the trips are discussed in the next section.

5.4.2 Trip characteristics

Table 19 shows the characteristics of trips, including purpose, distance, travel time, travel cost, and mode used, before COVID-19. In Karachi, the trips before COVID-19 were mainly for the purposes of work, shopping, and social gatherings with percentages of 23%, 19%, and 23% respectively. The table shows that around 8% of the trips were for recreation and leisure. The distance travelled before COVID-19 has a smooth variation from 0.5 km to 20 km. The most used travel modes are private vehicles and walking, which probably could be due to the poor condition of public transport and costly travel on paratransit modes. Around 28% are walking trips who usually prefer to walk within the area of residence to have a healthy activity and leisure time.

In Lahore, 71% of the trips are for the purpose of work. The travel modes for a large portion are rickshaw and motorcycle (26% and 29% respectively), with walking accounting for 20% of trips.

Table 19: Trip characteristics, Karachi and Lahore city before COVID-19

Categories	Karachi		Lahore	
	Number of Trips	%	Number of Trips	%
Trip Purpose				
Grocery	57	19%	11	10%
Personal Need	42	14%	1	1%
Doctor visits	20	7%	14	13%
Work	68	23%	79	71%
Education	18	6%	2	2%
Social	69	23%	2	2%
Recreation	24	8%	3	2%
Total	298	100%	112	100%
Trip Distance				
Below 0.5 km	57	19%	18	16%
0.5 - 1 km	51	17%	12	10%
1.1 – 2 km	37	12%	10	9%
2.1 – 5 km	43	14%	32	28%
5.1 – 10 km	50	17%	10	9%
10.1 – 20 km	41	14%	15	13%
Above 20 km	21	7%	18	16%
Total	300	100%	115	100%
Travel Mode				
Walking	84	28%	23	20%
Rickshaw	24	8%	30	26%
Bus	19	6%	10	9%
Car	96	32%	17	15%
Motorcycle	56	19%	33	29%
Qunichi	10	3%	1	1%
Taxi, Uber/ Careem	9	3%	0	0%



Categories	Karachi		Lahore	
	Number of Trips	%	Number of Trips	%
Total	298	100%	114	100%
Travel time				
Below 5 minutes	74	25%	6	5%
6 – 15 minutes	105	35%	26	22%
16 - 30 minutes	60	20%	54	47%
31 - 45 minutes	34	11%	8	7%
46 minutes - 1 hour	14	5%	14	12%
1 - 2 hours	10	3%	8	7%
2+ hr	2	1%	0	0%
Total	299	100%	116	100%
Trip Cost				
None	86	29%	27	23%
PKR 10	7	2%	0	0%
PKR 11 – 20	19	6%	5	4%
PKR 21 – 50	43	14%	33	28%
PKR 51 – 100	48	16%	22	19%
PKR 101 – 200	55	18%	8	7%
PKR 201 – 500	37	12%	11	9%
PKR 500+	5	2%	10	9%
Total	300	100%	116	100%

5.5 Changes and difficulties due to COVID-19

5.5.1 Impacts of COVID-19 on travel and mobility

Table 20 shows the trips performed per person before COVID-19 and during COVID-19. In Karachi, the average trip rate per day before the COVID-19 pandemic was 1.43 trips/ person, which decreased to 0.3 trips per person during the lockdown. After the lockdown restrictions were eased the daily trip rate increased to 1.12 trips per person. This shows that in post-lockdown or 'neo-normal' conditions, the trip rate is lower than in the before-pandemic situation because all the economic and social activities have not been fully restored during the post-lockdown situation. The trip rate values show that a major reduction in trips was found during lockdown in Karachi due to the unavailability of public transport, the closure of working places, and the initiation of online systems for education and working from home. For example, compared with the before COVID-19 situation, around 80% less trips were produced during lockdown while a 22% decrease was observed after lockdown. The data collected from Lahore shows that the average trip rate per day before COVID-19 was 0.98, during lockdown it was around 0.46, which increased to 0.47 after the lockdown restrictions were eased out.

Table 20: Trips per person, Karachi and Lahore city

Situation	Trips/ respondent per day in Karachi city	Trips/ respondent per day in Lahore city	Trips/ respondent per day in Karachi from Online Survey
During COVID-19 (post-lockdown)	1.12	0.47	0.95
During COVID-19 Lockdown	0.30	0.46	0.52
Before COVID-19	1.43	0.98	2.07



Table 21 describes various factors which contribute to affect mode choice behaviour in Pakistan. In general, before COVID-19 a small portion of commuters selected public transport, mainly because it was economical, with fares being comparatively cheaper than paratransit for long distance journeys. Private transport users find paratransit modes comfortable and faster in comparison with public transport modes. Figure 11 describes the effect of the COVID-19 on the modal distribution of trips in Karachi and Lahore. In Karachi, the usage of each mode is not affected in a long-term sense by the pandemic as the percentages of trips made by all modes before COVID-19 and after the lockdown are approximately the same. Both during COVID-19 and before COVID-19, a high percentage of trips are by means of private vehicles (i.e. 50% trips on car and motorcycle). Active transportation played a vital role in the lifestyles of elderly and disabled people, with walking being the second most used mode. The respondents preferred to make trips within walking distance of their residence to either nearby markets for shopping or to socialise and carry out recreational activities. Only 10% of the respondents use public transport facilities for their daily needs. Whereas in Lahore, the number of trips is much affected due to COVID-19 as compared to the time before the pandemic. The usage of active modes and paratransit is comparatively higher in percentage terms than public transport modes. A significant decrease is observed in the commuting trips using public transport during the lockdown, which is an indicator that the availability of public transport might have decreased during the lockdown. Furthermore, elderly people might have avoided the use of public transport to reduce the risk of getting infected from the COVID-19 virus. Active transportation and use of paratransit increased due to the pandemic for various reasons, such as the unavailability of public transport or lack of proper enforcement of SOPs/ social distancing.

Table 21: Reason for selecting travel mode, Karachi and Lahore city

Modes of Transportation	Reason in Karachi city	Reason in Lahore city
Public transport	Cheaper	Cheap/ Cost-effective
Private modes	Comfortable, flexible, faster, Personal Mode	Safe, comfortable, cheap, less travel time
Paratransit	Convenient, availability	Comfortable, cheap
Active modes	Healthy lifestyle, Close to home	Near to home

Figure 11: Modal distribution of trips, Karachi and Lahore city during and before COVID-19

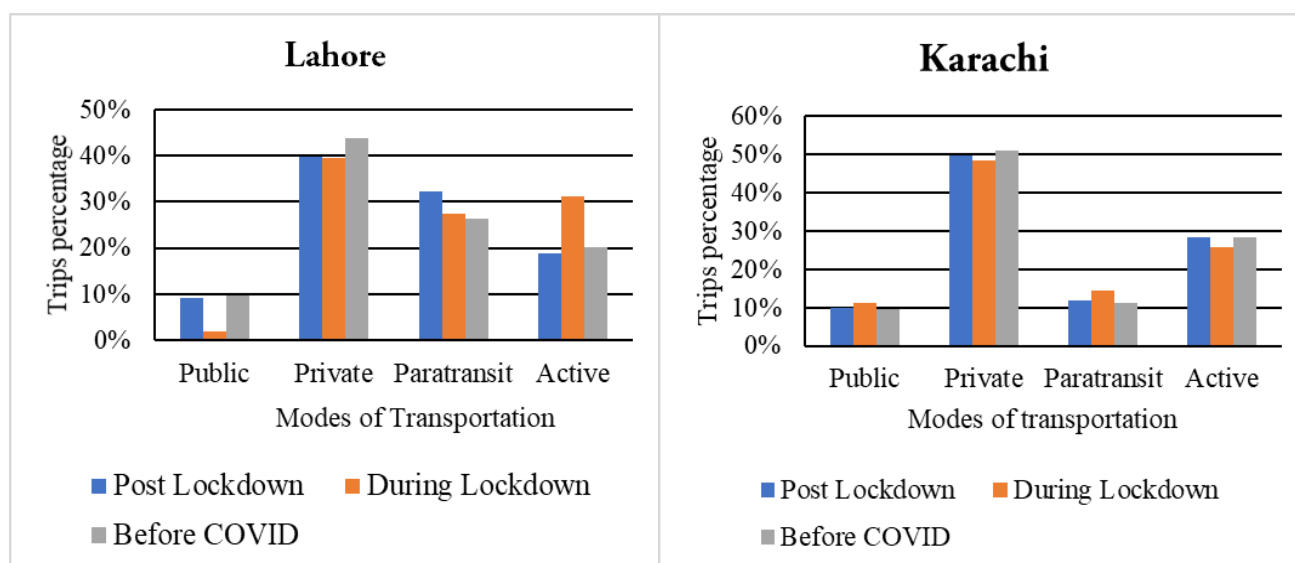


Figure 12 shows the modal distribution for all three scenarios using the data from the online survey. Similar observations to the household survey can be made - private vehicles comprise a large share of trips and, due to COVID-19, there is an increase in active transportation but a decrease in usage of public transport. The data shows that around 60% of the commuters use private vehicles to commute while only 11% were users of public transport before COVID-19, which has been further reduced to 7% after the lockdown restrictions were eased. Figure 13 shows the typical travel frequency of the respondents. The lockdown has decreased the trip



rate from several trips each day to 1 or 2-3 trips per week. In Lahore, the travel frequency of most of the respondents before the pandemic was 4-5 trips or 5+ trips per week, which is significantly affected during the lockdown.

A significant decrease in the number of trips during lockdown is observed as the highest proportion of 1 trip per week is observed during the lockdown. Data collected through the online survey, as in Figure 14, shows that almost 25% of the respondents made several trips each day during lockdown and before COVID-19, which decreased to a few trips a month and 2-3 trips a week. During lockdown 1 trip in a month is also a common frequency observed for about 25% of the respondents.

Figure 12: Modal Distribution of trips, Pakistan (Online Survey)

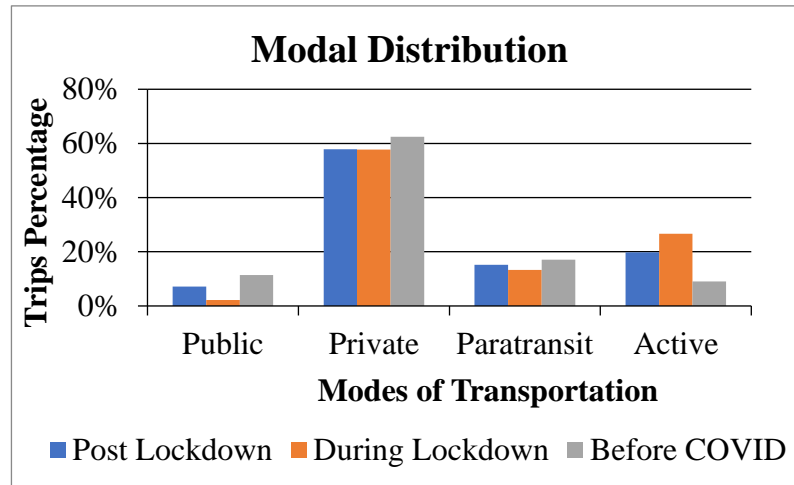


Figure 13: Respondent's travel frequency, Karachi and Lahore city during and before COVID-19

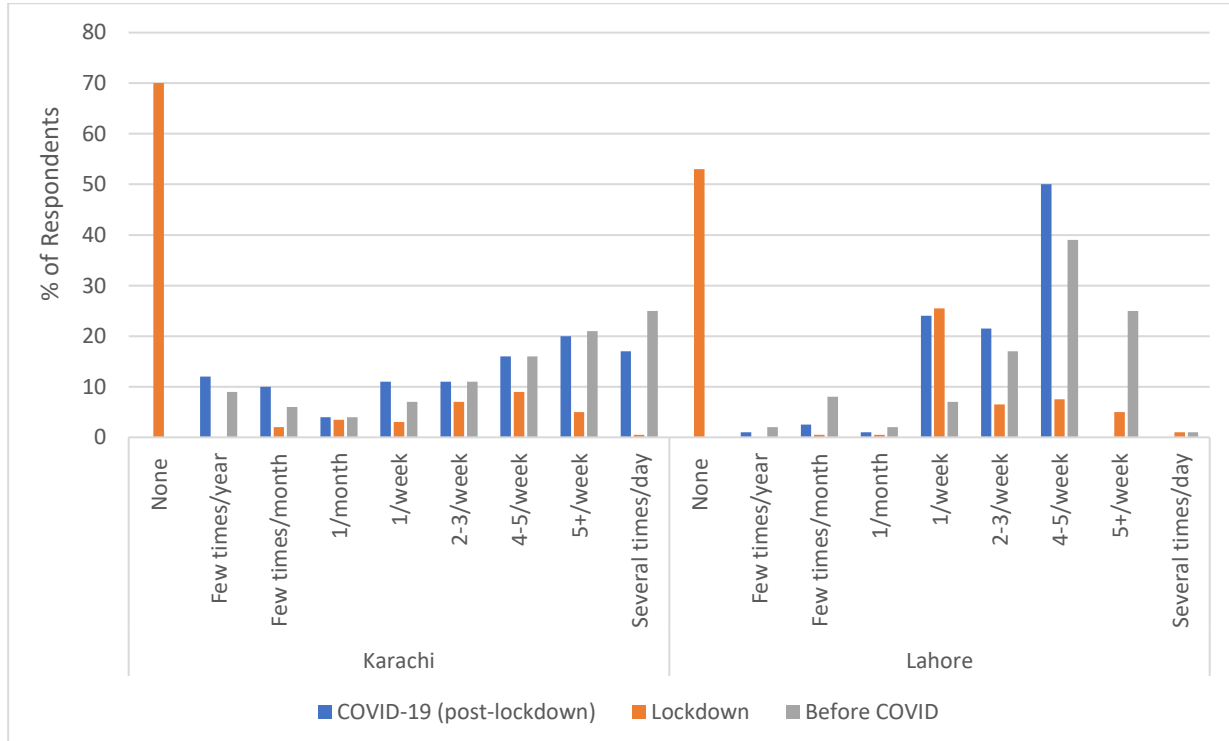




Figure 14: Respondent's travel frequency, Pakistan (Online Survey)

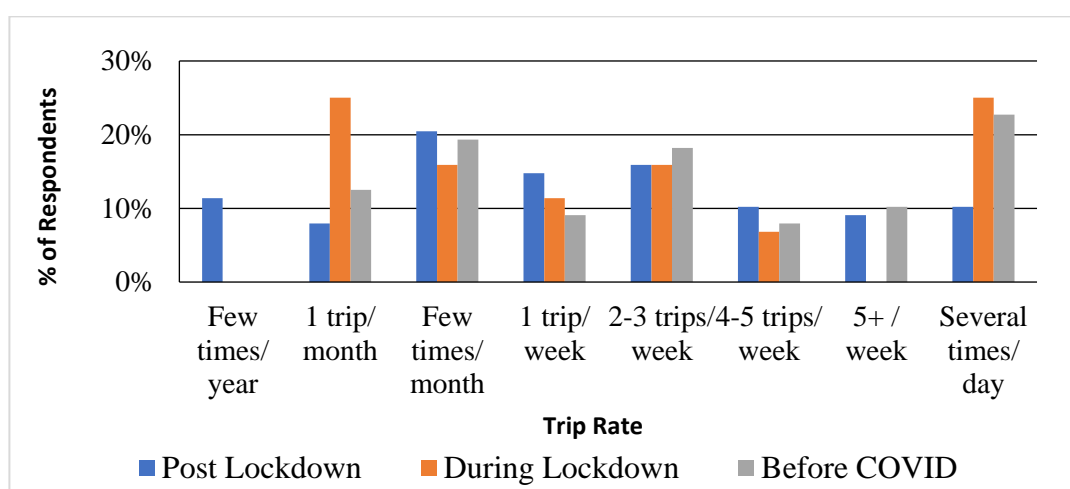


Figure 15 illustrates that the trips made during lockdown were mostly for the purposes of grocery, work, and doctor visits, which shows that only trips with a necessary purpose were made during the lockdown. On the other hand, trips involving socialising, recreation, and education are most affected by the COVID-19 situation. However, the percentage of recreation trips in Lahore was higher during lockdown. The percentage of work trips in Karachi during COVID-19 lockdown was higher than before the COVID-19 situation because during lockdown almost 70% of the respondents avoided travel (see Table 16) and the remainder who travelled did so mostly for necessary purposes. In Lahore though most people travelled for the purpose of work, the percentage of work trips during COVID-19 lockdown and post-lockdown was lower as compared to before COVID-19. Similarly, data from the online survey (as in Figure 16) shows that the most common purposes of travel in Pakistan during lockdown were grocery, doctor visits and work. The travel and trip activities that decreased due to COVID-19 were socialisation and education, though a slight increase of recreation during lockdown was observed.

Figure 15: Effect of COVID-19 on travel purpose in Karachi and Lahore city

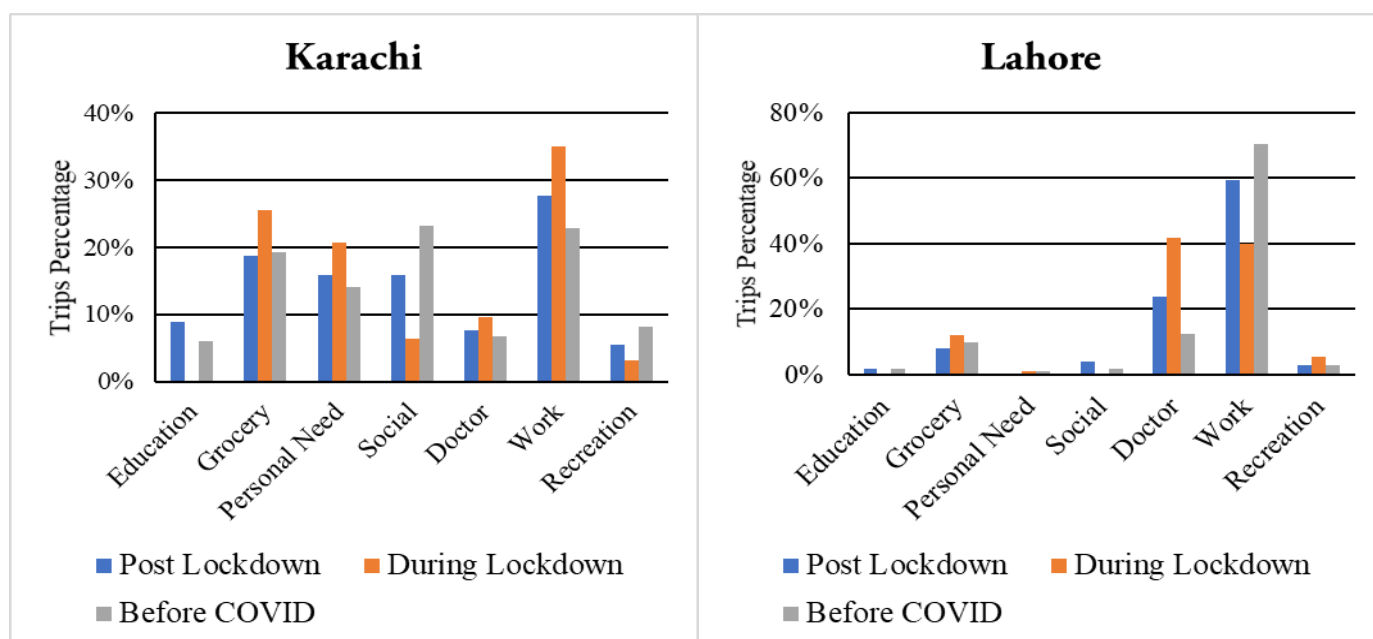
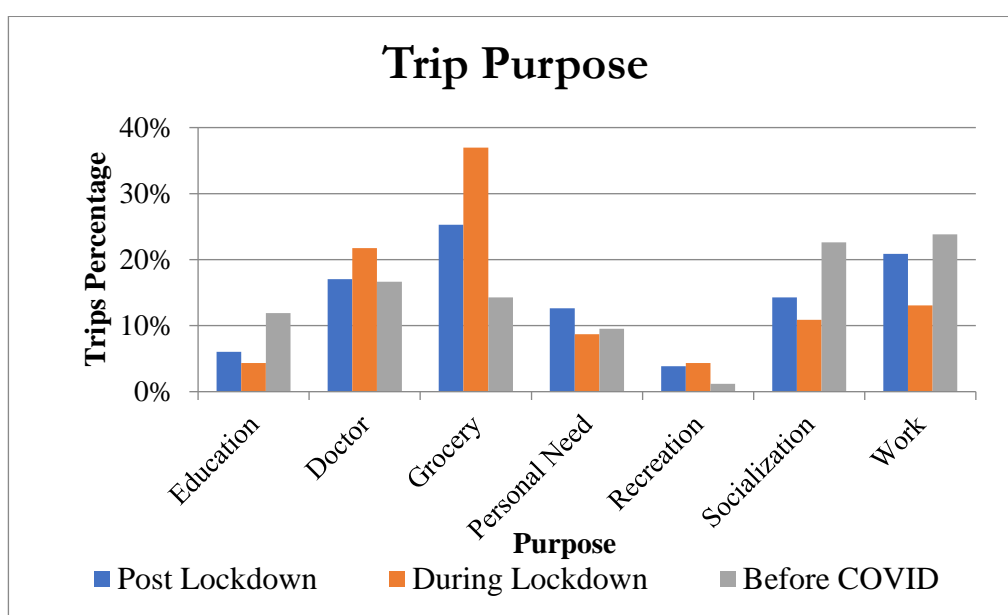




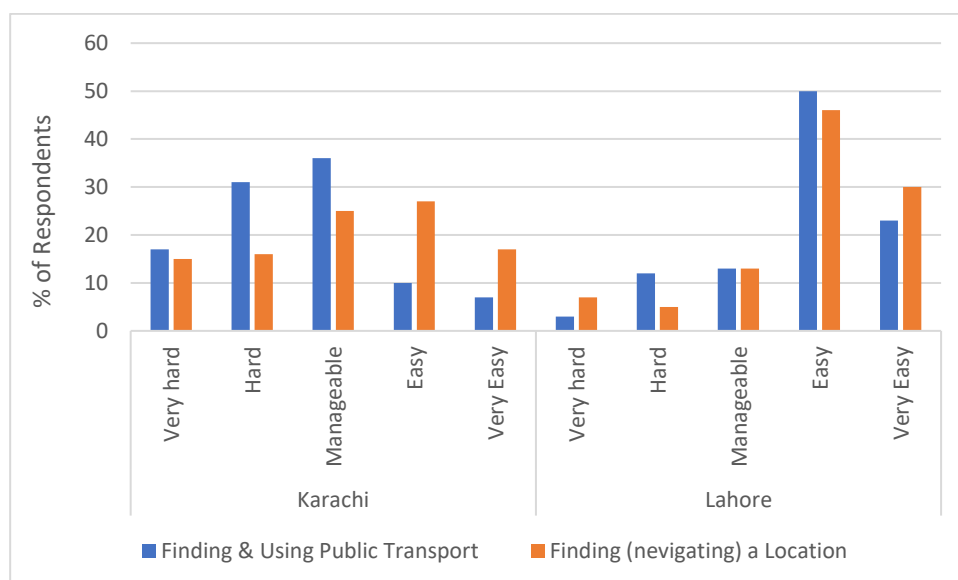
Figure 16: Effects of COVID-19 on travel purpose, Pakistan (Online Survey)



5.5.2 Difficulties and expectations

In general, finding public transport and using it for a trip in Karachi and Lahore is not easy. Figure 17 shows that in Karachi a large percentage of the respondents find it difficult or manageable to do so whereas in Lahore most of the respondents find it easy. A large portion in Lahore mentioned that it was easy or very easy. This is probably attributable to the recent improvements in public transport infrastructure, i.e. the Orange Line and Metrobus systems. On the other hand, in terms of navigating in the cities, or in identifying any location in the selected cities, a large portion of the respondents both in Karachi and Lahore reported that it was not difficult, i.e. that it was manageable, easy or very easy.

Figure 17: Level of difficulty to find and use public transport



The respondents were asked if they have faced any difficulties related to travel and mobility during and before COVID-19. Only 35% of the respondents in Karachi and 12% in Lahore mentioned that their typical travel and mobility had changed (e.g. travel less, fewer buses being available, bus routes changing) due to COVID-19. Almost 14% of the respondents mentioned either a change in their trip cost or that they are facing additional travel problems due to COVID-19. The reported difficulties in Karachi and Lahore before COVID-19 are:

- Less accessibility to bus stops;



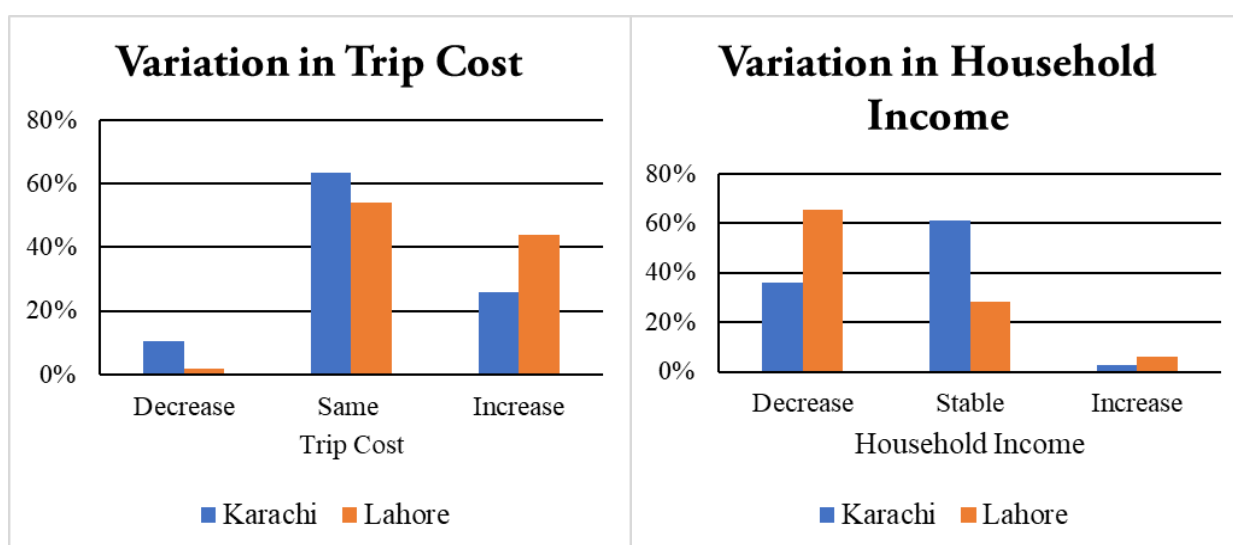
- Uncomfortable public transport - highly crowded buses and no seats available, no room for wheelchairs;
- Traffic congestion and high travel time;
- Air pollution;
- Less public transport and poor service, problem in getting into bus (drivers do not stop buses properly), less variety of modes options available;
- Poor infrastructure e.g. road potholes or absent of pedestrian road crossing facilities, difficult for wheelchair users;
- High fare or cost of fuel;
- Garbage on street or parked cars on footpaths;
- Lack of enforcement of traffic rules;
- Improper lightning at night.

The reported difficulties during COVID-19 are:

- Less availability of public transport;
- Travel cost increase;
- Travel frequency affected - less travel;
- Using mask is uncomfortable (particularly irritates while riding bike);
- SOPs not followed properly in public transport;
- Business affected and less social activity.

The data collected from the survey shows that 98% and 91% of respondents from Karachi and Lahore respectively had no change in their occupation due to COVID-19. It shows that COVID-19 had no major effect on the occupation of older people, as most of them were not in a regular job before COVID-19. However, Figure 18 shows that 36% and 63% of the respondents in Karachi and Lahore respectively reported a decrease in their household income, while 25% and 42% respectively found that the trip cost had increased due to COVID-19.

Figure 18: Variation of income and travel cost, Karachi and Lahore city due to COVID-19



The respondents were asked if they have any expectations or suggestions for improving travel and mobility. Only 19% of the respondents in Karachi provided their suggestions, though 87% in Lahore did so. The expectations and suggestions are similar for both cities. These are:

- SOPs must be followed - physical distancing should be ensured with proper enforcement;



- Mandatory precautions, e.g. distributing masks and sanitisers in public transport, avoiding taking sick people in public transport;
- Government should keep fare prices in control, provide subsidised transport or shuttle services during COVID-19;
- Extend the lockdown time;
- Taxi Apps for disabled people;
- Overcrowding in public transport should be avoided;
- More buses should be provided with high frequency;
- Construct more roads and improve the construction quality of roads for inclusive design;
- Providing more rickshaws;
- Restrict or avoid using Chingchi;
- Not to allow trucks operating in narrow streets;
- Build new mass transit projects similar to the Orange Line train.
- Government should decrease fuel cost;
- Providing proper signs and markings in main roads.



6. Findings from Tanzania

This chapter reports on data derived from Dar-es-Salaam city and Zanzibar Unguja of Tanzania. The data was collected from a household survey in various locations covering different socio-economic and spatial distributions of both cities. Totals of 203 and 155 respondents from Dar-es-Salaam and Zanzibar respectively were interviewed.

6.1 Socio-economic profile of the respondents

Most of the respondents are elderly people, and the age group 61-70 years is the highest (see Appendix Table E3-1). A detailed socio-economic profile of the respondents is available in Appendix E3. A very high proportion of the disabilities covered in the data concern knee/ joint pains (Figure E3-2). Of the respondents, 66% in Dar-es-Salaam and 55% in Zanzibar do their daily needs themselves while 34% and 45% respectively are dependent on family members or relatives (see Table E3-3). No respondents were found to live alone though very small proportions in both cities had a household size of 2-3 persons (Table E3-2). In Dar-es-Salaam 37% has 6-8 members but in Zanzibar 39% lived in households with size 8+ members. Monthly household income for almost half of the respondents in Dar-es-Salaam (44%) is GBP 50-100, while in Zanzibar it is GBP 50-100 for 40% and GBP 101-175 for 42%, as seen in Figure 19. Personal expenditure of the respondents reveals that most of the respondents in both cities spend only GBP 10-35 per month.

Figure 19: Respondent's household monthly income and individual expenditure, Dar-es-Salaam and Zanzibar

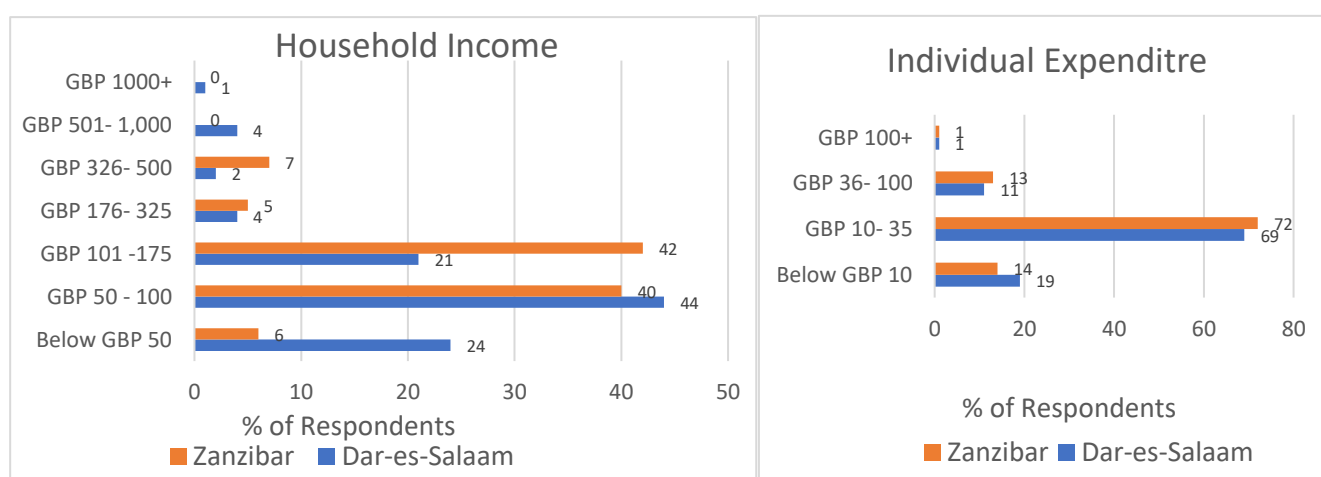


Table 22: Respondent's household vehicle ownership, Dar-es-Salaam and Zanzibar

Vehicle Ownership	Vehicle	Dar-es-Salaam City		Zanzibar Unguja	
		Number of Respondents	%	Respondents	%
No		174	86%	110	71%
Yes	Car	20	10	6	4
	Motorcycle	4	2	28	18
	Bicycle	5	2	11	7
	Sub-Total	29	14%	45	29%

Table 12 shows the vehicular ownership of the households. Most of the respondents, 86% in Dar-es-Salaam and 71% in Zanzibar, do not have any household owned vehicle and are hence solely dependent on public transport. The remainder (14% and 29% respectively in Dar-es-Salaam and Zanzibar) have a personal vehicle in the household; car for the majority in Dar-es-Salaam but motorcycle in Zanzibar. However, of the respondents having a household vehicle, 14% and 18% of them respectively in Dar-es-Salaam and Zanzibar, never have access or have only very rare access to that vehicle (Appendix Table E3-5). This shows that the reliance on public transport is extremely high in both cities.



6.2 Mobility and Trips During COVID-19 (Post-Lockdown)

This section discusses on travel frequency and the characteristics of trips during COVID-19 (post-lockdown⁸) for both cities in Tanzania.

6.2.1 Travel Pattern

Most of the respondents travel alone, while only 17% and 21% in Dar-es-Salaam and Zanzibar respectively are accompanied or escorted by a person (see in Appendix Table E3-4). Of the accompanied persons, the majority are accompanied by a family member while only 5% and 1% respectively in Dar-es-Salaam and Zanzibar are accompanied by a friend or Good Samaritan⁹. Table 13 describes the travel patterns of the respondents during COVID-19 post-lockdown. The highest frequency of travel in Dar-es-Salaam, involving more than half (59%) of the respondents, is 4-5 trips per week, while in Zanzibar Unguja the highest frequency (40% of the respondents) is 2-3 trips per week. Physical distancing and SOPs were mostly not adhered to both in Dar-es-Salaam and Zanzibar, as mentioned by 90% and 87% respectively. Almost 90% and 94% respectively in Dar-es-Salaam and Zanzibar mentioned that public transport is available during COVID-19. However, the major problems reported were lack of availability of public transport with proper enforcement of physical distancing.

Table 23: Respondent's travel frequency, Dar-es-Salaam and Zanzibar city during COVID-19 post-lockdown

Categories	Dar-es-Salaam City		Zanzibar Unguja	
	Number of Respondents	%	Number of Respondents	%
Travel Frequency				
Few times/ year	1	0.5	13	8.5
Few times/ month	1	0.5	00	00
1/ month	1	0.5	3	2
1/ week	2	1	29	19
2-3/ week	66	32.5	61	40
4-5/ week	119	59	42	27.5
5+/ week	13	6	5	3
Total	203	100%	153	100%
Physical Distancing				
Yes	20	10	18	13%
No	183	90%	118	87%
Availability of Public Transport				
Yes	183	90%	132	94%
No	20	10%	8	6%

To understand more detailed travel information, the respondents were asked, what was their total number of trips during the previous week. As seen in Table 24, the majority in Dar-es-Salaam (61%) made 3-5 trips, while in Zanzibar 59% made 1-2 trips. Very small portions (0.5% and 10% respectively in Dar-es-Salaam and Zanzibar) did not travel at all during the previous week. These respondents usually travelled occasionally, just a few times per month or year.

⁸ In Tanzania, the "lockdown" implied: closure of schools and universities; requirement for public transport to maintain physical distancing of passengers, with passenger numbers limited to the number of seats; discouragement of public social activities; and enforcement of use of face masks. Livelihood and production activities continued as usual. The lockdown period lasted for about three months, ending in June 2020.

⁹ Member of the staff of the orphanage or old home called Good Samaritan, an NGO.

**Table 24: Respondent's trips, Dar-es-Salaam and Zanzibar previous week**

Travel Frequency in previous week	Dar-es-Salaam		Zanzibar	
	Respondents	%	Respondents	%
None	1	0.5	15	10
1-2/ week	72	35.5	87	59
3-5/ week	124	61	41	28
5+/ week	6	3	4	3
Total	203	100%	147	100%

The details of trip characteristics are discussed in the next section.

6.2.2 Trip characteristics

Table 15 delineates the characteristics of trips including purpose, distance, travel time, travel cost, and mode used for the trips during COVID-19. In Dar-es-Salaam, trips were made having the main purposes of work and personal needs. The distance for around 36% of the trips is 2-5 km, whilst for 18% it is 1-2 km and for 16% it is 0.5-1 km. This reveals that elderly and disabled people usually travel within the area close to home. The two major travel modes used for commuting during COVID-19 are buses/ daladala and walking with percentages of 69% and 16% respectively, showing that the most manageable mode for people in Dar-es-Salaam is public transport as the private vehicle is often expensive.

Whereas in Zanzibar, around 38.5% and 21.5% of trips were made for the purpose of work and personal needs. The distance for around 38% of the trips is 2-5 km and for 23% it is 1-2 km. The major travel modes used for commuting in Zanzibar during COVID-19 are buses/ daladala, walking, and motorcycle with 68%, 15%, and 11% using these modes respectively. More than half of the respondents in both cities mentioned that their average trip cost during COVID-19 is Tsh¹⁰ 500-1000 (GBP 0.17-0.35), though a significant portion mentioned no cost for walking.

Table 25: Trip characteristics, Dar-es-Salaam and Zanzibar during COVID-19 post-lockdown

Categories	Dar-es-Salaam City		Zanzibar Unguja	
	Number of Trips	%	Number of Trips	%
Trip Purpose				
Grocery	13	6%	23	16.5%
Personal Need	32	16%	30	21.5%
Doctor Visit	20	10%	11	8%
Work	92	45%	54	38.5%
Social	15	7%	21	15%
Recreation	1	1%	1	1%
Begging	30	15%	0	0
TOTAL	203	100%	140	100%
Trip Distance				
Below 0.5 km	7	3%	4	3%
0.5 - 1 km	33	16%	14	9%
1.1 – 2 km	36	18%	35	23%
2.1 – 5 km	72	36%	59	38%
5.1 – 10 km	36	19%	21	13%

¹⁰ Tsh is Tanzanian currency. In November 2020, the conversion rate of 1 GBP was Tsh 3,050.



Categories	Dar-es-Salaam City		Zanzibar Unguja	
	Number of Trips	%	Number of Trips	%
10.1 – 20 km	13	6%	7	4%
Above 20 km	3	2%	0	0
No Trip made	0	0	15	10%
TOTAL	200	100%	155	100%
Travel Mode				
Walking	33	16%	21	15%
Wheelchair	8	4%	4	3%
Bicycle	1	1%	1	1%
Bus/ Daladala	141	69%	95	68%
Car	8	4%	2	1.5%
Motorcycle	7	3.5%	15	11%
Tricycle	2	1%	0	0
Taxi, Uber	3	1.5%	2	1.5%
TOTAL	203	100%	140	100%
Reason for using the travel mode				
Low cost or save money	62	28	34	23.5
Manageable	141	63	86	60
Short distance/ trip	13	6	5	3.5
Own vehicle	7	3	16	11
Safe	0	0	3	2
Total	223	100%	144	100%
Travel time				
Below 5 minutes	11	5%	3	2%
6 – 15 minutes	64	32%	56	36%
16 - 30 minutes	81	40%	67	43%
31 - 45 minutes	29	14%	9	6%
46 minutes - 1 hour	7	4%	1	1%
1 - 2 hours	9	4%	2	1%
2+ hours	2	1%	2	1%
No Trip made	0	0	15	10%
TOTAL	203	100%	155	100%
Trip Cost				
None	75	37%	28	18%
Below Tsh 500	0	0	2	1%
Tsh 500 - 1,000	95	47%	80	52%
Tsh 1,000 - 3,000	20	10%	8	5%
Tsh 3,000 - 5,000	3	2%	9	6%
Tsh 5,000 - 10,000	4	2%	11	7%
Tsh 10,000 - 50,0000	5	2%	2	1%
No Trip made	0	0	15	10%



Categories	Dar-es-Salaam City		Zanzibar Unguja	
	Number of Trips	%	Number of Trips	%
TOTAL	202	100%	155	100%

6.3 Mobility and trips during lockdown

6.3.1 Travel pattern

During lockdown most of the respondents lived in their own house. However, a very few (1.5% and 7.5% respectively in Dar-es-Salaam and Zanzibar) were in other places (e.g. village, other city) before the lockdown and they returned home by bus or personal car during lockdown (see Annex Table E3-6). Table 16 describes the travel pattern of the respondents during the lockdown. Many respondents, 37% in Dar-es-Salaam and 59% in Zanzibar, avoided travel during the lockdown and preferred to stay at home while the remaining mentioned that they travelled during lockdown. Of respondents who made trips during the lockdown, there was a frequency of travel of 2-3 trips per week for 33% and 18.5% respectively in Dar-es-Salaam and Zanzibar. Almost all in both cities mentioned that public transport was available for their trips during lockdown and that physical distancing was followed.

Table 26: Respondent's travel frequency, Dar-es-Salaam and Zanzibar city during lockdown

Categories	Dar-es-Salaam City		Zanzibar Unguja	
	Number of Respondents	%	Number of Respondents	%
Travel Frequency				
No trip made	75	37%	91	59%
1 trip/ month	2	1%	2	1%
1 trip/ week	17	8%	10	6.5%
2-3 trips/ week	66	33%	29	18.5%
4-5 trips/ week	41	20%	23	15%
5+ / week	2	1%	0	0%
TOTAL	203	100%	155	100%
Physical Distancing				
Yes	102	80%	58	90%
No	26	20%	6	10%
Availability of public transport				
Yes	118	93%	60	95%
No	9	7%	3	5%

6.3.2 Trip characteristics

Table 17 describes the characteristics of trips, including purpose, distance, travel time, travel cost, and mode used during lockdown. In Dar-es-Salaam, the purpose for most of the trips were for necessities (e.g. work, grocery, visit to doctor and personal needs) while leisure trips (e.g. social gatherings and recreational trips) were avoided to remain safe from being infected. Almost 74% of the trips were within the distance of 5 km indicates the majority are avoiding travel longer distance. The major travel modes used for commuting in Dar-es-Salaam during lockdown were bus/ daladala and walking with a percentage of 58% and 19% respectively. The priority in terms of travel mode is given to public transport as compared to private vehicle due to cost savings or lower trip cost.

Whereas in Zanzibar, the purpose for most of the trips were for work and grocery/ shopping purposes with around 59% and 25% respectively. The distance for 77% trips are within 5 km. The major travel modes used for commuting in Zanzibar during lockdown are bus/ daladala, motorcycle, and walking with a percentage of



67%, 20%, and 8% respectively. The travel cost for most of the trips during lockdown is between Tsh 500-1000 (GBP 0.17-0.35) in both cities.

Table 27: Trip characteristics, Dar-es-Salaam and Zanzibar city during lockdown

Categories	Dar es Salaam		Zanzibar	
	Number of Trips	%	Number of Trips	%
Trip Purpose				
Grocery	18	14%	16	25%
Personal Need	7	5%	3	5%
Doctor visits	11	9%	6	9%
Work	66	52%	38	59%
Social	1	1%	1	2%
Recreation	0	0%	0	0%
Begging	25	19%	0	0%
TOTAL	128	100%	64	100%
Trip Distance				
Below 0.5 km	12	9.5	0	0%
0.5 - 1 km	17	13.5	3	4%
1.1 – 2 km	19	15	14	22%
2.1 – 5 km	47	36	32	51%
5.1 – 10 km	26	20.5	12	19%
10.1 – 20 km	6	4.5	3	4%
Above 20 km	1	1	0	0%
TOTAL	128	100%	64	100%
Travel Mode				
Walking	24	19%	5	8%
Wheelchair	11	9%	0	0%
Bicycle	1	1%	0	0%
Bus/ Daladala	75	58%	44	67%
Car	8	6%	2	3%
Motorcycle	6	5%	13	20%
Tricycle	1	1%	0	0%
Taxi, Uber	2	1%	1	2%
TOTAL	128	100%	64	100%
Reason for Using the Travel Mode				
Low cost or save money	32	25	8	12.5
Short trip/ distance	11	8.5	1	1.5
Manageable	80	62.5	45	70
Own vehicle	5	4	10	16
Total	128	100%	64	100%
Travel time				
Below 5 minutes	11	9%	0	0%



Categories	Dar es Salaam		Zanzibar	
	Number of Trips	%	Number of Trips	%
6 – 15 minutes	40	33%	31	48%
16 - 30 minutes	55	43%	26	40%
31 - 45 minutes	16	12%	4	6%
46 minutes - 1 hour	3	2%	1	2%
1 - 2 hours	2	2%	1	2%
2+ hours	1	1%	1	2%
TOTAL	128	100%	64	100%
Trip Cost				
None	63	49%	5	8%
Below Tsh 500	0	0%	1	2%
Tsh 500 - 1,000	53	41%	38	59%
Tsh 1,000 - 3,000	6	5%	8	12%
Tsh 3,000 - 5,000	1	1%	7	11%
Tsh 5,000 - 10,000	2	2%	5	8%
Tsh 10,000 - 50,000	3	2%	0	0%
Tsh 50,000+	0	0%	0	0%
TOTAL	128	100%	64	100%

6.4 Mobility and trips before COVID-19

6.4.1 Travel pattern

Table 18 describes the travel frequency of the respondents before COVID-19 pandemic. Most respondents both in Dar-es-Salaam and Zanzibar had 2-3 trips or 4-5 trips per week. A few of them travelled very occasionally (e.g. few times in a month or year) while a few other very frequently (e.g. 5+ trips per week). Almost all the respondents (86% and 92% respectively in Dar-es-Salaam and Zanzibar) mentioned that before COVID-19 there was public transport available for their trips.

Table 28: Respondent's travel frequency, Dar-es-Salaam and Zanzibar Unguja before COVID-19

Categories	Dar es Salaam City		Zanzibar Unguja	
	Number of Respondents	%	Number of Respondents	%
Travel Frequency				
Few times/ year	00	00	7	5
Few times/ month	1	0.5	4	2.5
1/ month	1	0.5	1	0.5
1/ week	6	3	29	19
2-3/ week	82	40.5	60	39.5
4-5/ week	96	47.5	47	31
5+/ week	16	8	4	2.5
Total	202	100%	152	100%
Availability of Public Transport				
Yes	174	86	140	92
No	28	14	12	8



More than 90% of the respondents in both cities mentioned that on a typical day before COVID-19 they usually travelled or went outside of their home for once per day. The characteristics of the trips are discussed in the next section.

6.4.2 Trip characteristics

Table 19 describes the characteristics of the trips including purpose, distance, travel time, travel cost, and mode used for trips before COVID-19. In Dar-es-Salaam, though the main purpose of the trips for half of the respondents (49%) is for work, for 14% and 8% respectively it is for personal needs and social activities. The distance travelled before COVID-19 has a smooth variation from below 1 km to 20 km though the majority are within 5 km. The most used travel mode is bus/ daladala though all other modes are used by the remaining small portion of respondents. Ease of mode use, low cost and manageability are the main reasons for walking or using public transport.

In Zanzibar, the majority (44%) of the respondents are also commuting for work though social and personal needs are also significant. Though the travel mode for most trips is bus/ daladala (70%), the use of motorcycles is also significant (13%).

Table 29: Trip characteristics, Dar-es-Salaam and Zanzibar Unguja before COVID-19

Categories	Dar es Salaam City		Zanzibar Unguja	
	Number of Trips	%	Number of Trips	%
Trip Purpose				
Grocery	14	7%	24	17%
Personal Need	29	14%	25	18%
Doctor	15	7%	12	8%
Work	99	49%	62	44%
Education	1	1%	0	0%
Social	16	8%	22	16%
Begging	29	14%	0	0%
TOTAL	203	100%	145	100%
Trip Distance				
Below 0.5 km	6	3%	3	2%
0.5 - 1 km	35	17%	17	11%
1.1 – 2 km	23	11%	28	18%
2.1 – 5 km	83	41%	66	43%
5.1 – 10 km	46	23%	25	16%
10.1 – 20 km	6	3%	6	4%
Above 20 km	4	2%	0	0%
No Trip Made	0	0%	10	6%
TOTAL	203	100%	155	100%
Travel Mode				
Walking	36	18%	19	13%
Wheelchair	9	4%	5	3%
Bicycle	1	1%	2	1%
Bus/ Daladala	136	67%	98	70%
Car	8	4%	3	2%
Motorcycle	6	3%	19	13%



Categories	Dar es Salaam City		Zanzibar Unguja	
	Number of Trips	%	Number of Trips	%
Tricycle	2	1%	0	0%
Taxi, Uber	5	2%	2	1.5%
TOTAL	203	100%	148	100%
Reason for using the travel mode				
Low cost or save money	51	25	23	15
Short trip/ distance	12	6	1	1
Own vehicle	7	3.5	15	10
Manageable	133	65.5	111	73
Safe	0	0	2	1
Total	203	100%	152	100%
Travel time				
Below 5 minutes	10	5%	4	2%
6 – 15 minutes	61	30%	54	35%
16 - 30 minutes	89	44%	74	48%
31 - 45 minutes	30	14%	9	6%
46 minutes - 1 hour	6	3%	0	0%
1 - 2 hours	6	3%	1	1%
2+ hours	1	1%	3	2%
No Trip Made	0	0%	10	6%
TOTAL	203	100%	155	100%
Trip Cost				
None	81	40%	30	19%
Below Tsh 500	0	0%	0	0%
Tsh 500 - 1,000	96	47%	84	54%
Tsh 1,000 - 3,000	15	7%	9	6%
Tsh 3,000 - 5,000	6	3%	8	5%
Tsh 5,000 - 10,000	3	2%	13	8%
Tsh 10,000 - 50,000	2	1%	1	1%
Tsh 50,000+	0	0%	0	0%
No Trip Made	0	0%	10	7%
TOTAL	203	100%	155	100%

6.5 Changes and difficulties due to COVID-19

6.5.1 Impacts of COVID-19 on mobility and trips

Around 65% fewer trips were produced during lockdown compared with before COVID-19, while after the lockdown more than 30% increase was observed compared with the lockdown situation. However, the trips performed per person during and before COVID-19, as shown in Table 30, are almost the same for before COVID-19 and during COVID-19 post-lockdown. However, a slight decrease in the trips was found during the lockdown due to the unavailability of public transport and the closure of some workplaces and education centres.



Table 30: Trips per person, Der-es-Salaam and Zanzibar Unguja

COVID-19 Situation	Trips per respondent per day	
	Dar-es-Salaam City	Zanzibar Unguja
During COVID-19 (post-lockdown)	1.10	1.05
During Lockdown	0.60	0.45
Before COVID-19	1.12	1.17

Only 2% of the respondents in Dar-es-Salaam mentioned that their typical travel and mobility has changed (e.g. travel less, lesser buses are available, changed the route) due to COVID-19 while nobody from Zanzibar mentioned any change. In both cities, nobody mentioned either any change in trip cost or any additional travel problems due to COVID-19. However, almost all the respondents reported no change in occupation but a decrease of household income.

Table 31: Reason for selecting travel mode, Dar-es-Salaam and Zanzibar Unguja

Modes of Transportation	Dar-es-Salaam City	Zanzibar Unguja
Public	Cheaper, Manageable	Cheap/ Cost-effective
Private	Comfortable, Personal Mode	Personal Mode, Safe, comfortable
Active	Healthy lifestyle, Close to home	Near to home, Manageable

Various causes of mode choice by the respondents, as in Table 21, are mentioned, such as cheaper fares or cost effectiveness for public transport. Private transport users mentioned that private transport was a more comfortable and safer mode than other modes. Figure 20 shows the effects of the COVID-19 on the modal distribution of trips. Travel mode usage is not affected as the percentages of trips made by all modes before COVID-19 and after lockdown are approximately the same in both cities. However, a slight decrease in public transport and increase in private vehicles is observed in Dar-es-Salaam. In Zanzibar, there is a slight increase in private vehicles and in public transport but a decrease in active modes.

Figure 20: Modal distribution of trips, Dar-es-Salaam and Zanzibar Unguja during and before COVID-19

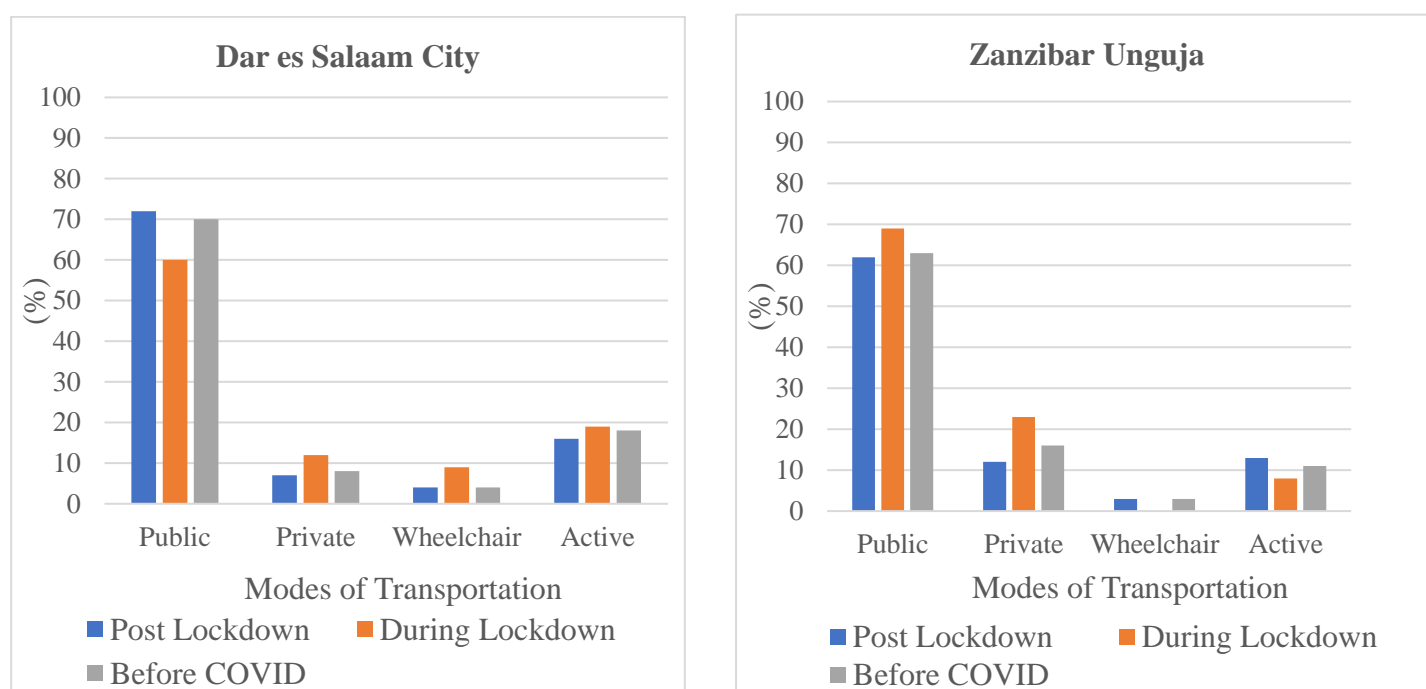


Figure 21 shows the typical travel frequency of the respondents during lockdown, post-lockdown and before COVID-19. Generally, the concentration of trips remained the same, between one and five trips per week, but the trip frequency reduced during lockdown for many of the respondents. For example, in Dar-es-Salaam



most of the respondents' average travel frequency before COVID-19 was 4-5 trips per week but during lockdown the proportion of respondents having 4-5 trips per week is much less. For the majority it is 2-3 trips per week or no trips per week.

Figure 21: Respondent's travel frequency, Dar-es-Salaam and Zanzibar during and before COVID-19

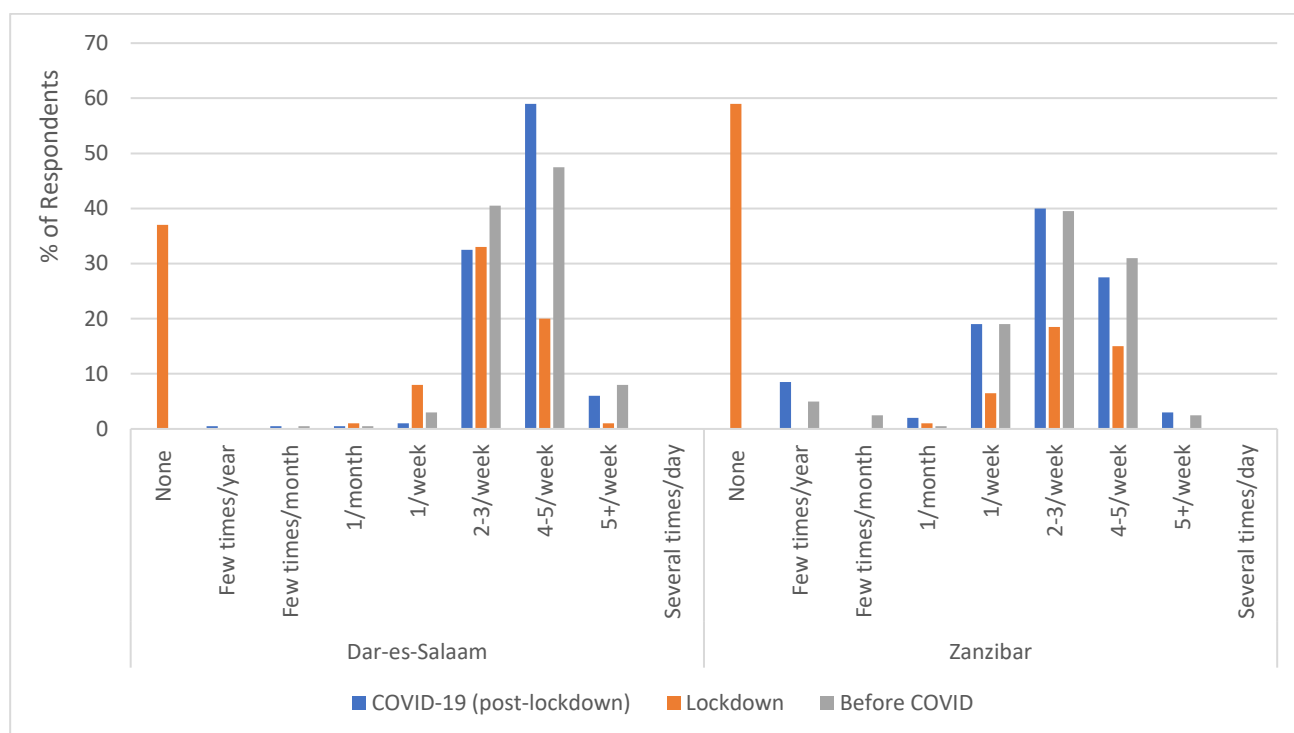


Figure 22: Effects of COVID-19 on travel purpose, Dar-es-Salaam and Zanzibar

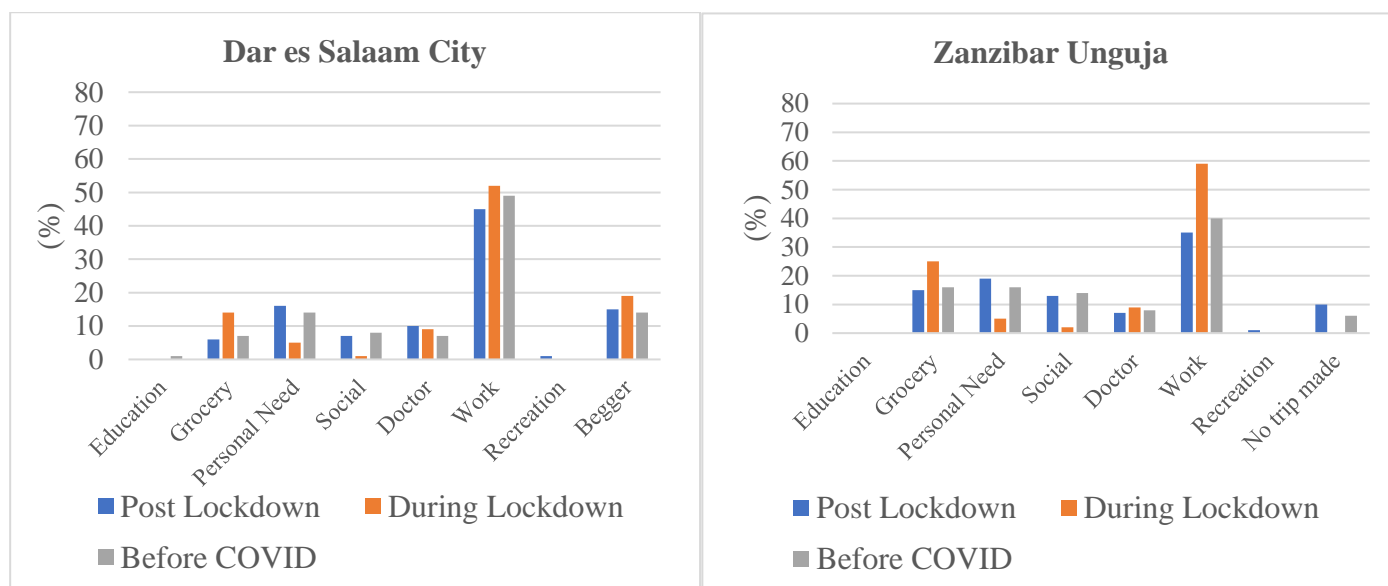


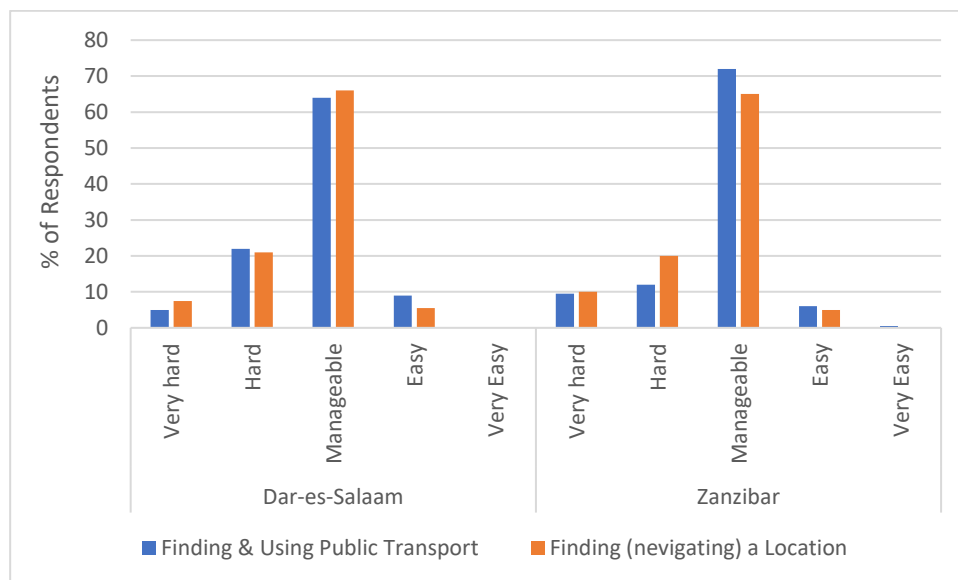
Figure 22 illustrates that the purposes of trips made during lockdown were mostly for work, grocery, and doctor visits, so it can be assumed that only trips with a necessary purpose are made. The pattern of trip purposes did not change much during COVID-19 lockdown in Dar-es-Salaam and Zanzibar because most of the workplaces remained open and production activities continued to sustain life. The proportion of trips for work is higher during lockdown compared with post-lockdown and before COVID-19. There was also an increase in trips for grocery, including market or purchase of vegetables or necessities. On the contrary, the trips for socialising, recreation, and personal needs were reduced during COVID-19 lockdown.



6.5.2 Difficulties and expectations

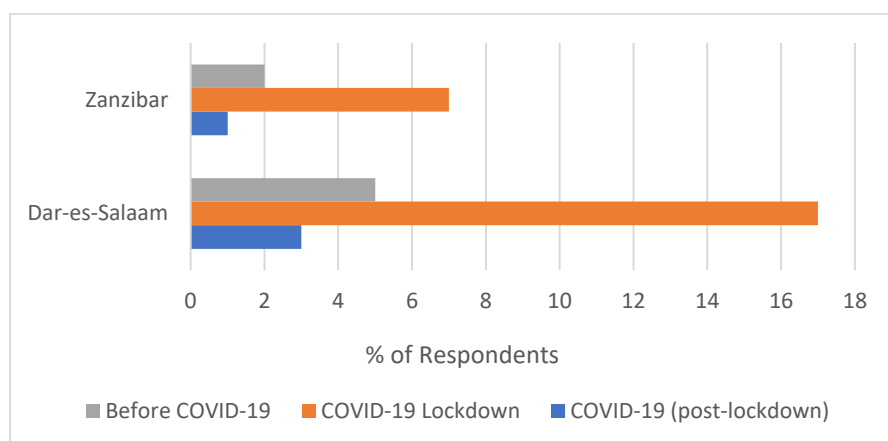
In general, finding public transport for a trip in Dar-es-Salaam and Zanzibar is not easy. Though more than half of the respondents in both cities mentioned 'manageable', as shown in Figure 23, a small portion mentioned that it is difficult or very difficult. Similarly, in terms of difficulty level faced by commuters in navigating in the cities or in identifying any location in the selected cities, a small portion of the respondents in both cities mentioned difficult or very difficult, though the majority said it is 'manageable'.

Figure 23: Level of difficulty in finding public transport, Dar-es-Salaam and Zanzibar



The respondents were asked if they have faced any difficulties related to travel and mobility during and before COVID-19. Figure 24 shows that only a few respondents mentioned that they had a problem; the number is comparatively higher in both cities during lockdown.

Figure 24: Proportion of respondents facing travel problems, Dar-es-Salaam and Zanzibar



The reported difficulties in both cities are similar. The difficulties before COVID-19 are:

- Public transport is not friendly and accessible for disabled and elderly people;
- Conductors sometime do not allow to board in the buses/ daladala;
- Disrespect of young people in the buses; and
- Traffic jam particularly in Dar-es-Salam.

The difficulties during COVID-19 (post-lockdown) are reported as the same for before COVID-19 pandemic. However, it was mentioned that boarding a bus/ daladala is usually very difficult which become more complicated due to COVID-19 and two respondents in Dar-es-Salaam mentioned inability to afford the fare



due to decrease of income. During lockdown, the difficulties mentioned for before COVID-19 and for post-lockdown persists and added the following:

- Longer waiting time or walk because lesser amount of public transport vehicles (e.g. buses/ daladala) are available;
- Poor safety precaution e.g. physical distancing in public transport is not maintained;
- Wearing a mask is uncomfortable for breathing.

Nevertheless, the respondents were asked if they have any expectation or suggestion for improving their travel and mobility. Only 4% and 2% of the respondents in Dar-es-Salaam and Zanzibar respectively provided their suggestions. The suggestions are almost similar in both cities. These are:

- Improved public transport accessible for elderly and disabled people;
- Reduced fare rates in public transport for elderly and disabled people;
- Provision of dedicated or special bus services only for elders and disabled people;
- Increase the number of public transport vehicles; and
- Considering COVID-19, need to avoid overcrowding in public transport and awareness campaign to follow protective measures such as mask using and physical distancing.



7. Findings from Zambia

This chapter reports on data derived from Lusaka and Kitwe city in Zambia. Totals of 201 and 211 respondents from Lusaka and Kitwe respectively were collected from a household survey and analysed. The enumerators used an App based questionnaire in the Smartphone or Tab instead of a paper-based printed questionnaire for conducting the household surveys.

7.1 Socio-economic profile of the respondents

Many respondents in Lusaka are older people of age group 61-70 years while in Kitwe are disabled people of age group 40-60 years (see in Appendix Table E4-1). A detailed socio-economic profile of the respondents is available in Appendix E4. Of the respondents, 63% and 62% in Lusaka and Kitwe respectively, do their daily needs themselves while the remaining are dependent on their family members or relatives (Table E4-4). Only a small percentage of the respondents, 4% and 1.5% respectively in Lusaka and Kitwe, live alone (in Table E4-3). Most of the respondents are from households consisting of 6-8 members.

Monthly household income indicates that many of the respondents in Lusaka are in income groups below GBP 50 and GBP 50-100 while in Kitwe a large portion fall in the income groups below GBP 50 and GBP 201-400 (Figure 25). A large proportion of the respondents in both cities are in lower income groups. This also been reflected in the monthly personal expenditure of the respondents.

Figure 25: Respondent's monthly household income and individual expenditure, Lusaka and Kitwe

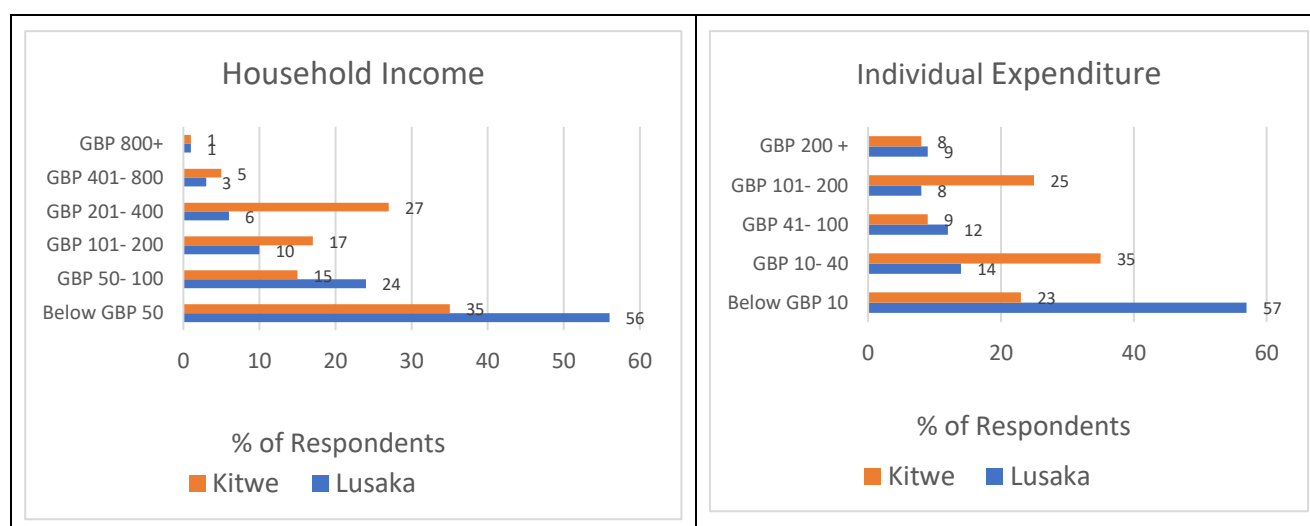


Table 32: Respondent's household vehicle ownership, Lusaka and Kitwe

Vehicle Ownership	Vehicle	Lusaka		Kitwe	
		Number of Respondents	%	Respondents	%
No		146	72%	128	61%
Yes	Car	37	18.4	79	37
	Motorcycle	5	2.5	0	0
	Bicycle	13	6.5	4	2
	Sub-Total	55	28%	83	39%

Most of the respondents do not have any household owned vehicle. Only 28% in Lusaka and 39% in Kitwe have a personal vehicle in the household and for the majority it is a car, as seen in Table 32. However, of the respondents having a household vehicle, many of them have a very rare or no access to that vehicle (Appendix Table E4-7). It shows that the reliance on public transport is extremely high in both cities.



7.2 Mobility and trips during COVID-19 (post-lockdown)

This section provides information on travel patterns and characteristics of trips during COVID-19 (post-lockdown¹¹) for both cities in Zambia.

7.2.1 Travel pattern

Most of the respondents travel alone while only 35% and 26% respectively in Lusaka and Kitwe are accompanied or escorted by another person (Appendix Table E4-5). The average frequency of trips is shown in Table 33. A large portion of the respondents in Lusaka (28% and 22% respectively) make 2-3 trips or 4-5 trips per week while almost half of the respondents in Kitwe (47.5%) make more than 5 trips per week. There are several respondents who travel just a few times in a year or month. Physical distancing during the trip was not adhered to by almost half of the respondents, 50% and 32% respectively in Lusaka and Kitwe. More than two-third of the respondents, 79% and 76% respectively in Lusaka and Kitwe, mentioned that public transport is available for their trips during COVID-19.

Table 33: Respondent's travel frequency, Lusaka and Kitwe city during COVID-19 post-lockdown

Categories	Lusaka		Kitwe	
	Number of Respondents	%	Number of Respondents	%
Travel Frequency				
Few times/ year	17	8.5	8	4
Few times/ month	9	4.5	27	13
1/ month	10	5	1	0.5
1/ week	33	16.5	3	1.5
2-3/ week	57	28	39	18.5
4-5/ week	44	22	28	13
5+/ week	24	12	101	47.5
Several times/ day	7	3.5	4	2
Total	201	100%	211	100%
Physical Distancing				
Yes	100	50%	144	68%
No	101	50%	67	32%
Availability of Public Transport				
Yes	158	79%	160	76%
No	43	21%	51	24%
Problems Due to COVID				
Yes	90	45%	90	43%

To understand more detailed travel information, the respondents were questioned on their total number of trips during the previous week. As seen in Table 34, half of the respondents in Lusaka mentioned 1-2 trips per week during COVID-19 post-lockdown while in Kitwe it was 5+ trips per week. The higher frequency of trips in Kitwe could be attributed to less strict enforcement (and hence more available travel modes), or to Kitwe being an industrial city, with many respondents travelling for work. Several respondents (7% and 11% in Lusaka and Kitwe respectively) did not travel at all during previous week: such respondents usually travel on a more occasional basis i.e. a few times in a year.

¹¹ In Zambia, the "lockdown" implied closure of schools and universities, discouragement of public social activities, requirement to maintain physical distancing and enforcement of face mask but the livelihood and production activities continued as usual.



Table 34: Respondent's trips, Lusaka and Kitwe city previous week or month

Travel Frequency in last week	Lusaka		Kitwe	
	Frequency	%	Frequency	%
None	14	7	23	11
1-2/ week	101	50	39	18.5
3-5/ week	46	23	34	16
5+ / week	35	17.5	110	52
1-2/ month	4	2	0	0
3-5/ month	1	0.5	5	2.5
Total	201	100%	211	100%

The details of trip characteristics are discussed in the next section.

7.2.2 Trip characteristics

The major purposes of trips during COVID-19 are shown in Table 35. Most of the trips were for the purpose of work, personal needs, and doctor visits with 17%, 24%, and 17% respectively in Lusaka, while in Kitwe the main purposes were for work, social, and others/business with 31%, 15% and 19.5% respectively. The purposes of grocery and social visits were also significant in both cities.

Table 35: Respondent's trip characteristics, Lusaka and Kitwe city post-COVID-19 post-lockdown

Categories	Lusaka City		Kitwe Unguja	
	Number of Trips	%	Number of Trips	%
Trip Purpose				
Grocery	21	10.5	22	10.5
Personal Need	49	24	21	10
Doctor Visits	34	17	16	7.5
Work	34	17	65	31
Education	7	3.5	11	5
Social	24	12	32	15
Recreation	1	0.5	3	1.5
Others/ Business	31	15.5	41	19.5
TOTAL	201	100%	211	100%
Trip Distance				
Below 0.5 km	40	20	10	5
0.5 – 1 km	48	24	17	8
1.1 - 2 km	33	16.5	16	7.5
2.1 - 5 km	37	18	54	26
5.1 - 10 km	26	13	81	38
10.1 - 20 km	8	4	11	5
20+ km	5	2.5	12	5.5
Outside of the city	4	2	10	5
Total	201	100%	211	100%
Travel Mode				
Walking	89	44	28	13.5



Categories	Lusaka City		Kitwe Unguja	
	Number of Trips	%	Number of Trips	%
Wheelchair	10	5	12	6
Bicycle	1	0.5	9	4
Bus	65	32	70	33
Car	21	11	79	37.5
Motorcycle or Pathao	3	1.5	00	00
Taxi or Uber	12	6	13	6
Total	201	100%	211	100%
Travel time				
Below 5 minutes	14	7	4	2
6-15 minutes	43	21.5	28	13.5
16-30 minutes	79	39	92	43.5
31-45 minutes	29	14.5	50	23.5
45 minutes – 1 hour	19	9.5	22	10.5
1 - 2 hour	10	5	7	3
2+ hours	7	3.5	8	4
TOTAL	201	100%	211	100%
Trip Cost (ZMW or K ¹²)				
None or Not Applicable	00	00	00	00
K 10 – 20	124	62	69	32.5
K 21 – 30	29	15	22	10.5
K 31 – 40	8	4	33	15.5
K 41 – 50	7	4	12	5.5
K 51 – 60	4	2	10	5
K 61 – 70	2	1	2	1
K 71 – 80	5	2.5	00	00
K 81+	22	11	63	30
Total	201	100%	211	100%

As can be seen in Table 35, the trip distance is spread mostly up to 20 km, though the majority in Lusaka are shorter (e.g. below 5 km) while in Kitwe are longer (e.g. 5-10 km). The three major travel modes in Lusaka during COVID-19 are buses, walking, and car, with percentages of 32%, 44%, and 11% respectively. In Kitwe, the major travel modes are buses, car, and walking with 33%, 37.5%, and 13.5% respectively. These figures indicate that beside walking, public transport is the most manageable mode for many respondents.

The travel time for more than half of the trips is within 30 minutes in both cities, probably due to short trip distances for the majority, though a small portion of the trips require above 1-2 hour or 2+ hours. The trip cost for the majority is very low, e.g. K 10-20 (GBP 0.40-0.75), in both cities. However, a large portion (30%) in Kitwe has a very high cost, e.g. K 80+ (GBP 3), probably because they hire or reserve the vehicle. Low travel cost or fare and saving money are the main reasons for using a travel mode for the majority in both cities (Table 36). The other reasons for selecting a mode are the efficient or fast mode and short distance in Lusaka. In Kitwe, the main other reasons are: availability or only mode; comfortable; and easy access and convenient.

¹² Zambian currency ZMW or kwacha. In November 2020, value of GB pound was equivalent to ZMW or K 26.

**Table 36: Reason for selecting travel mode, Lusaka and Kitwe during COVID-19 post-lockdown**

Reason for Selecting Travel Mode	Lusaka City		Kitwe City	
	Respondent	%	Respondent	%
Available/ only mode	17	9	54	25.5
Easy access, convenient	15	8	31	14.5
Comfortable	4	2	51*	23.5
Low cost/ fare or save money	73	37.5	54	25.5
Short trip/ distance	19	10	4	2
Can't walk, difficult to use bus	14	7	0	0
Health purpose or fitness	4	2	3	1.5
Own vehicle	7	3.5	5	3
Efficient & effective, fast	36	18.5	8	4
Others*	5	2.5	1	0.5
Total	194	100	211	100

* Others include the answers preferred, no vehicle is available, secured travel mode.

7.3 Mobility and trips during lockdown

7.3.1 Travel pattern

During lockdown most of the respondents lived in their own house. However, a few (19% and 15% respectively in Lusaka and Kitwe) were in other places (e.g. village, another part of the city, other city) before the lockdown and they returned home during lockdown (Appendix Table E4-6). Only a very few respondents (6% in both cities) avoided travel, but the remainder travelled and went outside of home during lockdown. Table 37 shows the frequency of their travel during the lockdown; almost half of the respondents in both cities travelled 2-3 times per week. A large portion in Lusaka travelled once per week, while in Kitwe a large number travelled 4-5 times or 5+ times per week.

Table 37: Respondent's travel frequency, Lusaka and Kitwe city during lockdown

Travel Frequency (trip per Week)	Lusaka		Kitwe	
	Respondent	%	Respondent	%
None	12	6	12	6
Weekly 1 (or 3-4 per month)	63	32.5	5	2
Weekly 2-3 times	79	40	96	48
Weekly 4-5 times	31	15	47	23
Weekly 5+ times	13	6.5	44	22
Total	198	100	204	100

7.3.2 Trip characteristics

Table 38 describes the characteristics of trips, including purpose, distance, travel time, travel cost, and mode used during lockdown. The main purposes for travel during lockdown are work, personal needs and purchase grocery or shopping. Trip distance for the majority in Lusaka is small, such as less than 0.5 km or 0.5-1 km, while in Kitwe is longer such as 2.1-5 km and 5.1-10 km. Most trips in Lusaka were on foot (because of short distances) or by bus while in Kitwe the majority were by bus or taxi. The main reasons for selecting a travel mode were mentioned as 'efficient or easy access' and 'low cost' in Lusaka while in Kitwe it was mentioned that they 'like the mode' or 'preferred mode' by many respondents.



Travel time for most of the trips during lockdown was 6-15 minutes or 16-30 minutes in both cities. Less travel time was needed because of short distances for many trips as well as less traffic congestion. The travel cost for the majority in Lusaka is very low e.g. below K 10 (GBP 0.4) or K 11-20 (GBP 0.4-0.75). In Kitwe travel cost is higher such as K 80+ (GBP 3+) for some 25.5% and also in the lower range such as below K10 (GBP 0.4) for some 19.5%.

Table 38: Respondent's trip characteristics, Lusaka and Kitwe city during lockdown

Categories	Lusaka City		Kitwe Unguja	
	Number of Trips	%	Number of Trips	%
Trip Purpose				
Grocery	54	27	57	27
Personal Need	60	30	39	18.5
Doctor Visits	27	13.5	17	8.5
Work	40	20	76	36
Education	3	1.5	7	3
Social	17	8	15	7
Recreation	0	0	0	0
Others/ Business	0	0	0	0
TOTAL	201	100%	211	100%
Trip Distance				
Below 0.5 km	54	27.5	6	3
0.5 – 1 km	51	26	15	7.5
1.1 - 2 km	29	15	19	9.5
2.1 - 5 km	32	16	67	31
5.1 - 10 km	21	10.5	74	35
10.1 - 20 km	4	2	15	7
20+ km	5	2.5	13	6
Outside of the city	00	00	2	1
Total	196	100%	211	100%
Travel Mode				
Walking	103	51	31	14.5
Wheelchair	13	6.5	8	4
Bicycle	2	1	5	2.5
Bus	52	26	64	30
Car	16	8	85	40
Motorcycle or pathao	2	1	00	00
Taxi	13	6.5	18	9
Total	201	100%	211	100%
Reason for using the travel mode				
Available/ only mode	27	13.5	30	14
Efficient or Easy access	80	40	23	11
Preferred option	27	13.5	113	53.5
Low cost/ affordable or save money	67	33	45	21.5



Categories	Lusaka City		Kitwe Unguja	
	Number of Trips	%	Number of Trips	%
Total	201	100%	211	100%
Travel time				
Below 5 minutes	18	9	6	3
6 - 15 minutes	62	31	38	18.5
16 - 30 minutes	72	36	93	44
31 - 45 minutes	18	9	37	17.5
45 minutes – 1 hour	17	9	23	11
1 - 2 hour	7	3	5	2
2+ hours	7	3	9	4
Total	201	100%	211	100%
Trip Cost (K)				
K 0 – 10	128	63.5	41	19.5
K 11 – 20	19	9.5	32	15
K 21 – 30	14	7	32	15
K 31 – 40	5	2.5	29	14
K 41 – 50	5	2.5	8	4
K 51 – 60	6	3	8	4
K 61 – 70	3	1.5	2	1
K 71 – 80	5	2.5	5	2
K 80+	16	8	54	25.5
Total	201	100%	211	100%

7.4 Mobility and trips before COVID-19

7.4.1 Travel pattern

Table 39 shows the average frequency of trips before COVID-19; the majority in both cities travelled many trips i.e. 5+ or 2-3 trips per week; it was even several times per day for many respondents in Lusaka. A large portion of the respondents in both cities also travel very rarely, a few times in a month.

Table 39: Respondent's travel frequency, Lusaka and Kitwe city before COVID-19

Frequency of Trips	Lusaka City		Kitwe City	
	Respondents	%	Respondents	%
Few times/ year	14	7	5	2
Few times/ month	48	24	36	17
1/ month	5	2.5	1	0.5
1/ week	10	5	5	2
2-3/ week	33	16.5	37	17.5
4-5/ week	26	13	10	5
5+/ week	38	19	110	52
Several times/ day	27	13.5	7	3
Total	201	100	211	100



Almost 57% and 71% of the respondents respectively in Lusaka and Kitwe mentioned that on a typical day before COVID-19 they usually travelled or went outside of home at least once in a day (see in Appendix Table E4-12). The characteristics of the trips are discussed in the next section.

7.4.2 Trip characteristics

Trip characteristics, including purpose, distance, travel time, travel cost, and mode used for travel before COVID-19 are shown in Table 40. In Lusaka, the main purposes of the trips are for work (32.5%), personal needs (34%) and visiting doctors or purchasing medicine (12.5%). In Kitwe, the main purposes are for work (43.5%), grocery purchase or shopping (10.5%), and social or visiting relatives (24%).

The average distance of trips before COVID-19 has a smooth variation from below 0.5 km to 20 km though the majority is in the range 1.1-2 km or 2.1-5 km in Lusaka but 2.1-5 km or 5.1-10 km in Kitwe. The most used travel modes are on foot (41.5%), bus (37.5%) and taxi (9%) in Lusaka; bus (37%), car (20%), taxi (23%), and walking (13%) in Kitwe. The proportion of trips on bicycle or motorcycle in both cities is very low. The main reasons for using the travel mode in Lusaka were mentioned as: low cost or affordability; and efficient and easy access. In Kitwe, an important reason is low cost or affordability.

Travel time for the majority is 6-15 minutes or 16-30 minutes in Lusaka, and 16-30 or 31-45 minutes in Kitwe, though several respondents mentioned 1-2 hours or 2+ hours. Travel cost for most trips in Lusaka is very low, i.e. below K10 (GBP 0.4) or K21-30 (GBP 0.75-1.15) while in Kitwe it is very high i.e. K80+ (GBP 3+).

Table 40: Respondent's trip characteristics, Lusaka and Kitwe city before COVID-19

Categories	Lusaka City		Kitwe Unguja	
	Number of Trips	%	Number of Trips	%
Trip Purpose				
Grocery	13	6.5	22	10.5
Personal Need	68	34	25	12
Doctor Visits	25	12.5	12	5.5
Work	65	32.5	92	43.5
Education	7	3	7	3
Social	20	10	50	24
Recreation	3	1.5	3	1.5
TOTAL	201	100%	211	100%
Trip Distance				
Below 0.5 km	24	12	2	1
0.5 – 1 km	35	17.5	12	5.5
1.1 – 2 km	53	26.5	23	11
2.1 - 5 km	47	23.5	44	21.5
5.1 - 10 km	29	14	91	43
10.1 - 20 km	5	2.5	14	6.5
20+ km	4	2	16	7.5
Outside of the city	4	2	9	4
Total	201	100%	211	100%
Travel Mode				
Walking	83	41.5	27	13
Wheelchair	9	4.5	7	3.5
Bicycle	3	1.5	5	2
Bus	75	37.5	78	37



Categories	Lusaka City		Kitwe Unguja	
	Number of Trips	%	Number of Trips	%
Car	10	5	42	20
Motorcycle or Pathao	1	0.5	0	0
Taxi or Uber	19	9	49	23
Other (Train & bus)	1	0.5	3	1.5
Total	201	100%	211	100%
Reason for using the travel mode				
Available/ only mode	23	11	25	12
Efficient & easy access	68	34	26	12
Preferred option	22	11	95	45
Low cost/ fare or save money, affordability	88	44	65	31
Total	201	100%	211	100%
Travel time				
Below 5 minutes	8	4	3	1.5
6 - 15 minutes	48	24	25	12
16 - 30 minutes	74	37	80	38
31 - 45 minutes	36	18	64	30
45 minutes – 1 hour	23	11	18	8.5
1 - 2 hours	4	2	9	4
2+ hours	8	4	12	6
Total	201	100%	211	100%
Trip Cost (K)				
None or Not Applicable	91	45	35	16.5
Below K 10	00	00	00	00
K 11 – 20	38	19	39	18.5
K 21 – 30	21	10.5	38	18
K 31 – 40	12	6	19	9
K 41 – 50	5	2.5	7	3.5
K 51 – 60	5	2.5	9	4.5
K 61 – 70	9	4.5	4	2
K 71 – 80	4	2	2	1
K 80+	16	8	58	27
Total	201	100%	211	100%

7.5 Changes and difficulties due to COVID-19

7.5.1 Impact of COVID-19 on mobility and trips

Only 38% and 63.5% of the respondents in Lusaka and Kitwe respectively mentioned that their typical travel and mobility have changed due to COVID-19 (Appendix Table E4-13). Their reported main changes are:

- Less travel and movement to remain safe (fear or afraid of COVID-19 infection);
- Avoiding public transport by using a private vehicle, taxi or walking;



- Maintain physical distancing and wear face mask while travel and use hand sanitiser;
- Increased travel cost (bus fare and fuel price);
- Less buses are available.

More than half of the respondents (58% in Lusaka and 66% in Kitwe) mentioned that their trip cost has been changed and mostly increased, due to COVID-19 (Table E4-14). Occupation have not changed after COVID-19 for many respondents, only 16% in Lusaka and 6% in Kitwe indicated change (Table E4-15). It is not surprising to find change for a very small portion because many of the respondents were not working before COVID-19, as the sample of this research is elderly and disabled persons. The major changes reported are: shifted or changed job pattern or business type, reduced working days, loss of job (unemployed). Nevertheless, almost half of the respondents (69% in Lusaka and 41.5% in Kitwe) mentioned that their household income has decreased after COVID-19 (Table E4-16).

Figure 26 shows the effect of the COVID-19 on the modal distribution of trips in Lusaka and Kitwe. In Kitwe, the usage of public transport and paratransit modes have reduced while active modes and private modes have increased during lockdown and post-lockdown compared with before COVID-19. Whereas in Lusaka, the proportion of trips in active modes and private modes has increased but decreased in public transport both during COVID-19 lockdown and post-lockdown compared with the before COVID-19. The respective increase or decrease during the lockdown was relatively high compared with the post-lockdown period. The proportion of trips on paratransit and private modes in Lusaka during lockdown is almost the same as it was before COVID-19. However, during post-lockdown the proportion of trips on paratransit decreased but increased on private modes. This situation indicates that the availability of public transport might have decreased particularly during the lockdown and/ or the elderly or disabled people might have avoided the use of public transport to reduce the risk of getting infected from COVID-19 virus. Also, the increased use of active transport and private modes is due either to the unavailability of public transport or because no proper physical distancing is maintained in public transport.

Figure 26: Modal distribution of trips, Lusaka and Kitwe during and before COVID-19

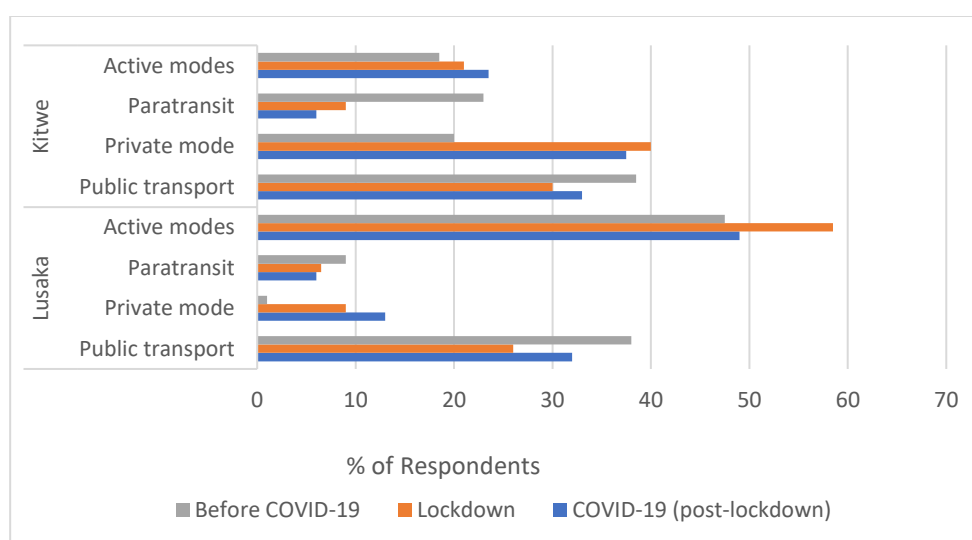


Figure 27 shows the typical travel frequency of the respondents. In Kitwe, the travel frequency of most of the respondents before the pandemic was 5+ trips per week, which is slightly affected during post-lockdown and significantly affected during the lockdown. Similarly, the travel frequency of most of the respondents in Lusaka before the pandemic was 5+ trips per week or several times per month, which is significantly affected during the lockdown and post-lockdown. For both cities, the highest proportion of the respondents are observed to have 2-3 trips per week during lockdown.



Figure 27: Respondent's travel frequency, Lusaka and Kitwe during and before COVID-19

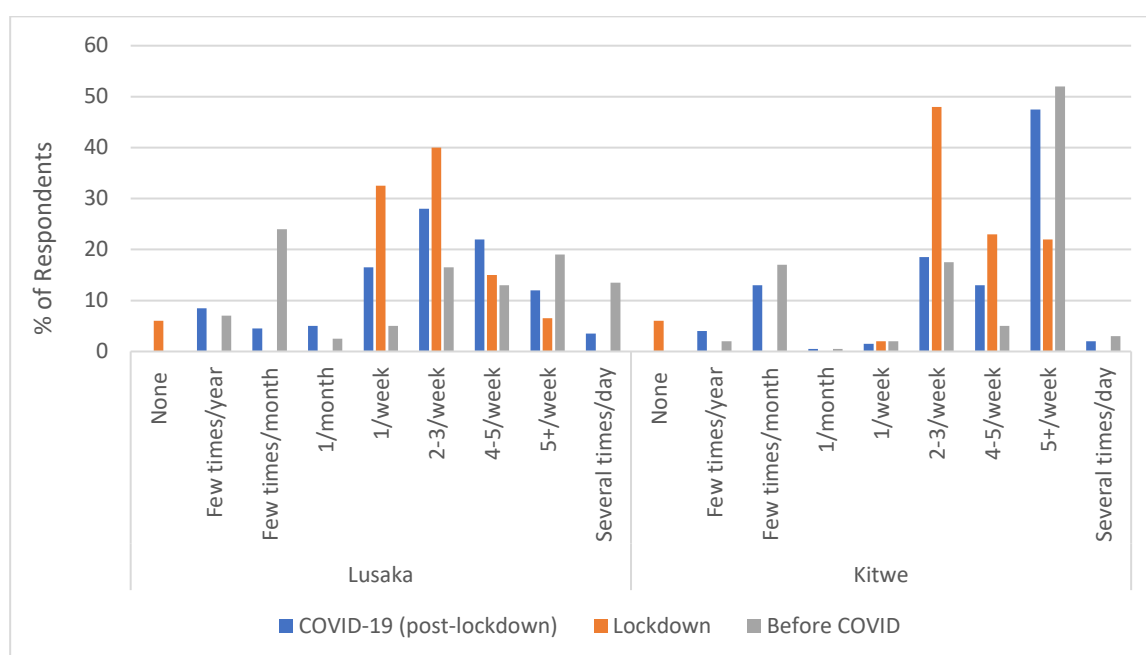


Figure 28: Effects of COVID-19 on travel purpose, Lusaka and Kitwe city

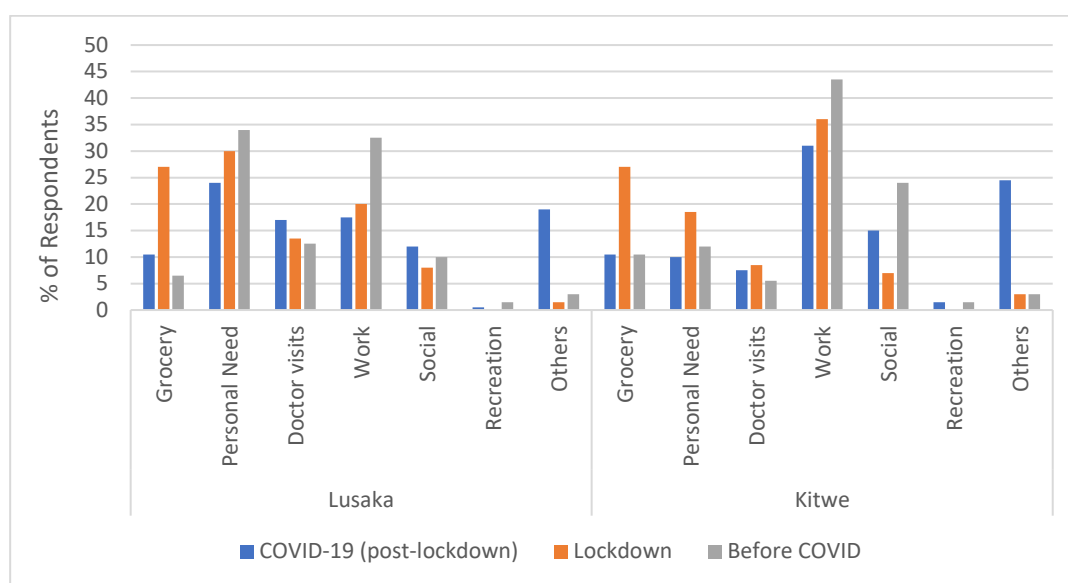


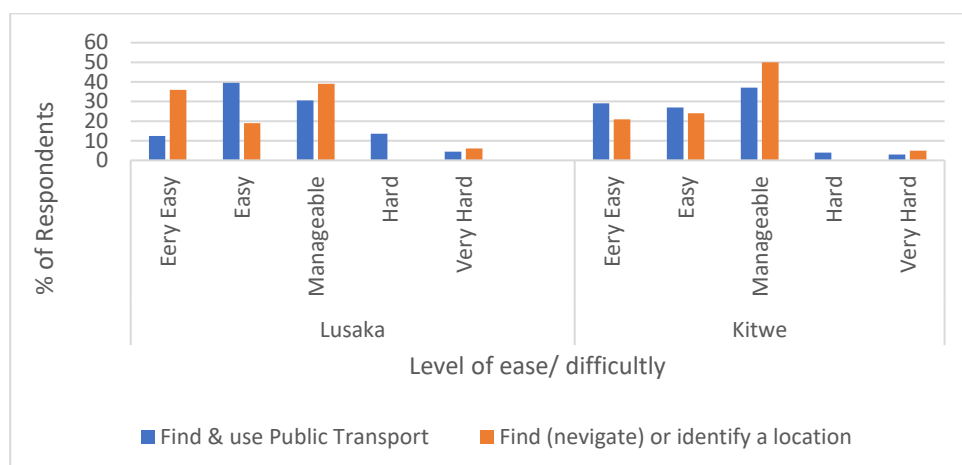
Figure 28 illustrates that the trips made during lockdown mostly consist of the purposes of work, grocery, personal need, and doctor visits. This shows that only trips with a necessary purpose were made during the lockdown. It can be interpreted that the situation during COVID-19 post-lockdown and before COVID-19 remained the same for work trips in Lusaka, while in Kitwe during post-lockdown work trips have increased and social trips decreased as compared to before COVID-19 and during the lockdown.

7.5.2 Difficulties and expectations

In general, finding public transport and using it for a trip in Lusaka and Kitwe is not easy. Figure 29 shows a significant portion of the respondents in both cities mentioned manageable while a small portion mentioned difficult or very difficult about finding and using public transport. Similarly, in terms of finding or navigating a location of the city, almost half of the respondents mentioned 'manageable'.



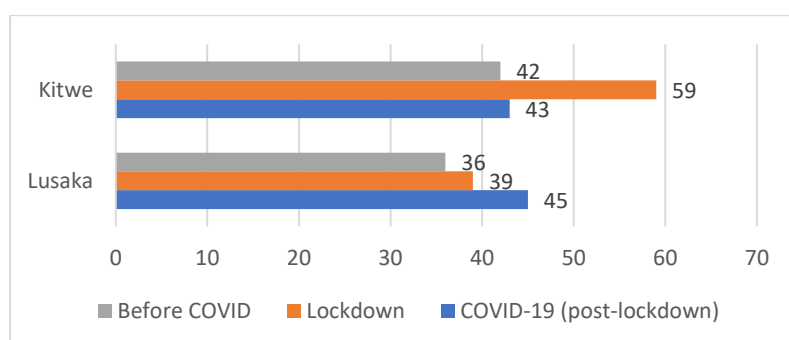
Figure 29: Level of ease to find and navigate public transport during lockdown



The respondents were asked if they have faced any difficulties related to travel and mobility during and before COVID-19. Figure 30 shows almost half of the respondents in both cities, but significantly higher in Kitwe during lockdown, had a travel problem. Before COVID-19, 36% and 42% respectively in Lusaka and Kitwe faced a travel problem which is 45% and 43% respectively during COVID-19 post-lockdown. During lockdown, 39% and 59% in Lusaka and Kitwe respectively faced a travel problem. Nevertheless, the respondents were asked if they have any new or additional travel problem due to COVID-19. Almost 46% and 83% in Lusaka and Kitwe respectively feel additional travel problems due to COVID-19. Of the remainder, who do not feel any additional travel problem due to COVID-19, 27% and 43% of them respectively in Lusaka and Kitwe mentioned that the magnitude of the travel problem compared to before COVID-19 is now higher due to COVID-19. The reported travel difficulties before COVID-19 in both cities are similar; these are:

- Cannot walk (due to backpain or too old) or difficult to travel, always need someone to help;
- Public transport is not friendly/ accessible for disabled and elderly people, most buses are not accessible for disabled and trouble in fitting the wheelchair in bus or no room for wheelchair;
- Buses remain overcrowded and no access, difficult to board/ alight;
- Public transport is not convenient, bus stop is far from home;
- Poor road condition, crossing and bus station – no walkways are provided and no provision for wheelchair users - most of the public and private buildings have no elevators.

Figure 30: Respondents facing travel issues, Lusaka and Kitwe



The difficulties during COVID-19 (post-lockdown) and during lockdown are the same. However, a few additional difficulties occur due to restrictions or regulations imposed. The added difficulties are:

- Reduced travel due to fear of COVID-19 or imposed restrictions on travel and movement;
- Increased travel cost (bus fare, gasoline price, switching from bus to taxi), as shown in Appendix Figure E4-1;
- Need to use face mask and wearing it for long time is uncomfortable for breathing;
- Need to use hand sanitiser regularly;



- Limited public transport (e.g. buses) are available so longer waiting time or walk;
- Reduced seating capacity in bus for maintaining physical distancing;
- Lack of compliance to maintain physical distancing (not properly maintained in buses/ public places) and wearing face mask;
- Walking is tiring and no one to help for pushing the wheelchair.

Nevertheless, the respondents were asked if they have any expectation or suggestion for improving travel and mobility. Almost 36% of the respondents from each city provided their suggestions for during COVID-19 period which are similar for both cities. These are:

- Impose restriction on travel and movement of people to avoid unnecessary trips;
- Strictly following the health guidelines (e.g. maintain physical distancing, wearing face mask) and monitoring to adhere COVID-19 guidelines;
- Provision of hand sanitisers in vehicles, disinfecting and hand wash facilities in vehicles and stations;
- Less passengers in public transport to ensure physical distancing;
- Use personal or own vehicle and walking or cycling.

Beside these, the respondents mentioned some measures that could improve the overall mobility and access of elderly and disabled people even if there is no COVID-19; these are:

- Improved public transport accessible for elderly and disabled people, spacious design to accommodate room for wheelchairs and easy movement in bus. Infrastructure including buildings and roads should have provisions for elderly and wheelchair users;
- Reduced fare rates in public transport for elderly and disabled people;
- Proper bus station design and should be in the centre of residential area;
- More walkways and need to accommodate all types of pedestrians;
- Provide better transport service, reduce congestion, more buses and prevent overcrowding in buses;
- Subsidise wheelchairs and walking canes for elderly and disabled to help them navigate the city.



8. Summary of the findings and comparison

This chapter provides a summary of the findings from the eight cities of the four different countries that have been discussed in the previous four chapters. A comparison is made between the cities. This chapter is structured according to the following sections:

- Mobility and trips of the respondents before COVID-19, particularly the frequency and purpose of trips;
- Mobility and trips during COVID-19 (both lockdown and post-lockdown);
- Major changes in mobility and trips of the respondents due to COVID-19; and
- The travel difficulties of the respondents in different cities.

8.1 Mobility and trips before COVID-19

As can be seen in Table 41, before COVID-19, the frequency of trips for most of the respondents in all the cities was 2-3 trips or 4-5 trips or even 5+ trips per week. A small number made several trips per day, only once in a week or once or a few times per month. A further small number, particularly in Dhaka, Karachi, Zanzibar and Lusaka travel just a few times per year: this is mainly because of their physical disability and thus difficulties for travel.

Table 41: Respondent's frequency of trips before COVID-19 (%)

Frequency	Dhaka	Khulna	Karachi	Lahore	Dar-es-Salaam	Zanzibar	Lusaka	Kitwe
Few times/ year	16	1.5	9	2	0	5	7	2
Few times/ month	10.5	1.5	6	8	0.5	2.5	24	17
1/ month	4	3	4	2	0.5	0.5	2.5	0.5
1/ week	7	5.5	7	7	3	19	5	2
2-3/ week	18	30	11	17	40.5	39.5	16.5	17.5
4-5/ week	13.5	42.5	16	39	47.5	31	13	5
5+/ week	27.5	12.5	21	25	8	2.5	19	52
Several times/ day	3.5	3.5	25	1	0	0	13.5	3

As can be seen in Table 42, the main purposes for the trips in almost all the cities are for work, grocery/ shopping, or personal needs. A significant portion of the trips are also for grocery, doctor visits or social purposes such as visiting relatives or friends. Very few trips are made for recreation.

Table 42: Respondent's purpose of trips before COVID-19 (%)

Purpose	Dhaka	Khulna	Karachi	Lahore	Dar-es-Salaam	Zanzibar	Lusaka	Kitwe
Grocery	24	13.5	19	10	7	17	6.5	10.5
Personal Need	9.5	12	14	1	14	18	34	12
Doctor visits	13	10	7	13	7	8	12.5	5.5
Work	24	50	29	73	49	44	32.5	43.5
Social	17.5	10.5	23	2	8	16	10	24
Recreation	9	0	8	3	0	0	1.5	1.5
Others	3	4	0	0	15	0	3	3

The trip distance before COVID-19 has a smooth variation from below 1 km to 20 km though the majority are within 5 km. For short distances, many respondents walk to save money and/ or have a healthy leisure activity. Active modes, such as walking and cycling, contribute about 20% of the trips in each city except Khulna. A significant portion of the trips in Khulna are on paratransit, namely easybikes. The proportion of



trips on paratransit is significant in every city except Dar-es-Salaam and Zanzibar where public transport modes such as bus or daladala serve the majority. Trips on private vehicles in Karachi and Lahore are higher due to having a higher car ownership rate.

8.2 Mobility and trips during COVID-19

During the COVID-19 lockdown, as can be seen in Table 43, most of the respondents in all the cities avoided travel and did not make any trips, except Lusaka and Kitwe. In Lusaka and Kitwe only a very few (6%) avoided travelling because there was no traffic ban or a strong enforcement of lockdown. Nevertheless, during the lockdown the frequency of travel was much less than before COVID-19 lockdown. For those who travelled during lockdown, in most of the cities the frequency was mostly once or 2-3 times per week, though 4-5 trips per week were made by many in Dar-es-Salaam, Zanzibar, Lusaka and Kitwe.

Table 43: Respondent's frequency of trips during COVID-19 lockdown (%)

Frequency of Travel	Dhaka	Khulna	Karachi	Lahore	Dar-es-Salaam	Zanzibar	Lusaka	Kitwe
None	80.5	53	70	53	37	59	6	6
Few times/ year	0	0	0	0	0	0	0	0
Few times/ month	2	2.5	2	0.5	0	0	0	0
1/ month	5.5	2.5	3.5	0.5	1	1	0	0
1/ week	5	12.5	3	25.5	8	6.5	32.5	2
2-3/ week	3	27	7	6.5	33	18.5	40	48
4-5/ week	0.5	0	9	7.5	20	15	15	23
5+/ week	0.5	1	5	5	1	0	6.5	22
Several times/ day	2.5	1.5	0.5	1	0	0	0	0

Table 44: Respondents' purpose of trips during COVID-19 lockdown (%)

Trip Purpose	Dhaka	Khulna	Karachi	Lahore	Dar-es-Salaam	Zanzibar	Lusaka	Kitwe
Grocery	50	8	25	12	14	25	27	27
Personal Need	7.5	0	21	1	5	5	30	18.5
Doctor visits	7.5	7	10	42	9	9	13.5	8.5
Work	15	46	35	40	52	59	20	36
Social	9	2	6	0	1	2	8	7
Recreation	5.5	1	3	6	0	0	0	0
Others	5.5	36	0	0	19	0	1.5	3

Table 44 shows the main purposes for travel during lockdown are purchasing grocery (or shopping more generally), work, and doctor visits, while the number of leisure trips (i.e. social gatherings and recreational trips) is very low. Social and recreation trips were avoided to remain safe from being infected. A significant proportion of trips in several cities are for other purposes, such as praying (worship or visiting a mosque) in Khulna or begging in Dar-es-Salaam. The distance of trips during lockdown is short - most of the respondents were avoiding travelling longer distances. More than 50% of the trips in Dhaka, Khulna and Karachi are within 1 km. In other cities, most trips are between 2 and 5 km. A major proportion are walking trips; 61%, 43% and 51% in Dhaka, Khulna and Lusaka respectively (refer to Table 8 and 38). A large portion of trips on motorcycle were observed in Karachi (19%), Lahore (21%) and Zanzibar (20%). A large portion of trips are on easybike (28.5%) and rickshaw (28%) respectively in Khulna and Lahore. However, the travel mode for a high percentage of trips was bus/ daladala in Dar-es-Salaam (58%), Zanzibar (67%), Lusaka (26%) and Kitwe (30%). During lockdown buses were operating in Tanzanian and Zambian cities and the larger proportion of trips on public transport, as compared to private vehicles, is due to cost savings or lower trip cost. The main reasons for using a particular travel mode during lockdown are: short distance, low cost, easy access and availability.

**Table 45: Respondent's frequency of trips post-COVID-19 lockdown**

Frequency of Trip	Dhaka	Khulna	Karachi	Lahore	Dar-es-Salaam	Zanzibar	Lusaka	Kitwe
None	1	1	0	0	0	0	0	0
Few times/ year	20	3	12	1	0.5	8.5	8.5	4
Few times/ month	10.5	4	10	2.5	0.5	0	4.5	13
1/ month	10	5	4	1	0.5	2	5	0.5
1/ week	11.5	12	11	24	1	19	16.5	1.5
2-3/ week	19.5	26	11	21.5	32.5	40	28	18.5
4-5/ week	11.5	41.5	16	50	59	27.5	22	13
5+/ week	14	6	20	0	6	3	12	47.5
Several times/ day	2	1.5	17	0	0	0	3.5	2

On the other hand, as can be seen in Table 45, during COVID-19 post-lockdown, the frequency of travel is once or 2-3 trips or 4-5 trips per week for the majority in all the cities. In Karachi, Lusaka and Kitwe a large proportion of the respondents were found to have very high travel frequency. Almost half of the respondents in Khulna (41.5%), Lahore (46%) and Dar-es-Salaam (59%) make 4-5 trips per week while in Zanzibar (40%) it is 2-3 trips per week. Many respondents travel 5+ trips per week in Karachi (20%), Lusaka (12%) and Kitwe (47.5%); however, the proportions of respondents are less compared to the situation before COVID-19 which were 21%, 19% and 52% respectively. There are several respondents who travel just a few times in a year or month or one trip per week; the proportion is more during post-lockdown compared to before COVID-19. This clearly reveals that the respondents travel less during COVID-19 (post-lockdown) than before COVID-19. Nevertheless, most of the respondents in all the cities mentioned that physical distancing was followed during their travel.

Table 46: Respondent's purpose of trips post-COVID-19 lockdown

Trip Purpose	Dhaka	Khulna	Karachi	Lahore	Dar-es-Salaam	Zanzibar	Lusaka	Kitwe
Grocery	23.5	15	19	8	6	16.5	10.5	10.5
Personal Need	10.5	11	16	0	16	21.5	24	10
Doctor visits	18	10.5	8	24	10	8	17	7.5
Work	21	49	37	61	45	38.5	17	31
Social	14	10	16	4	7	15	12	15
Recreation	7	0	6	3	1	1	0.5	1.5
Others	6	4.5	0	0	15	0	19	24.5

As can be seen in Table 46, the main purposes for trips are work, grocery or shopping, doctor visits – similar to the purposes during lockdown time. A small proportion of social trips (around 10%) were observed in all the cities; though the proportion is higher than in lockdown time it is lower than before the COVID-19 situation. However, recreation trips are less, as in lockdown time, compared with before COVID-19. Trips are mostly for short distance (within 5 km) though a small proportion are for long distance such as 10 to 20 km. Walking and buses are the major travel modes. Car is the travel mode for a significant proportion of trips in Dhaka (14%), Karachi (28%), Lahore (16%) and Kitwe (37.5%) in post-lockdown time, while before COVID-19 it was 13%, 32%, 15% and 0% respectively. Motorcycle is also significant in Khulna (9%), Karachi (21%), Lahore (24%), and Zanzibar (11%), which before COVID-19 had trip proportions of 12.3%, 19%, 29% and 13% respectively. Rickshaw in Dhaka and Lahore are also significant, as is easybike in Khulna. The proportion of rickshaw trips in Lahore is higher during post-lockdown (32%) than in lockdown (28%) or before the COVID-19

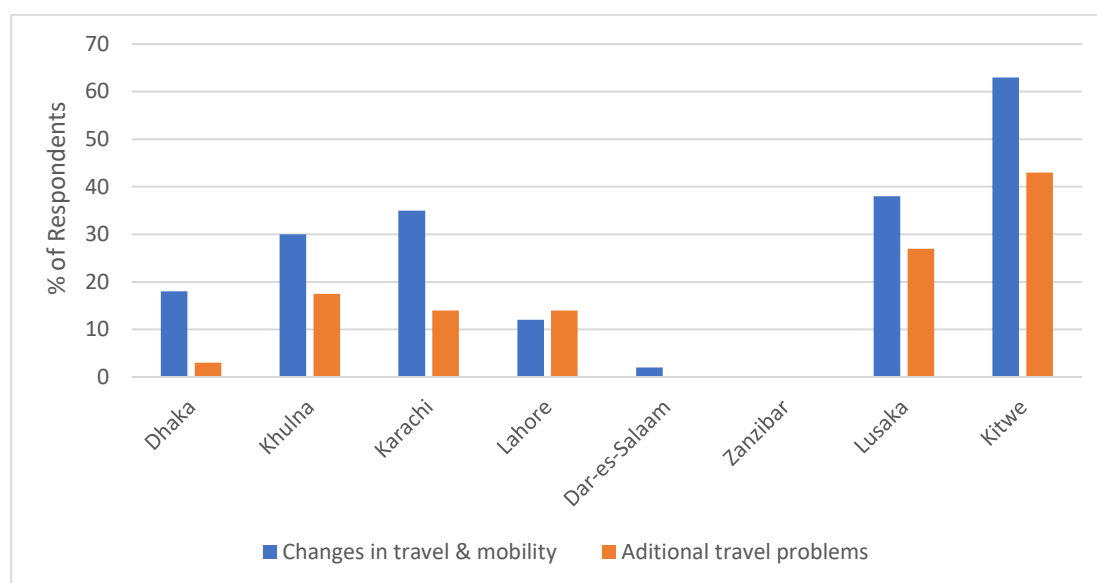


situation (26%). The main reasons for using a particular travel mode are: availability, easy access, short distance, low cost, comfort. Comfort of the mode was not very important for the respondents during lockdown time.

8.3 Changes in mobility and trips due to COVID-19

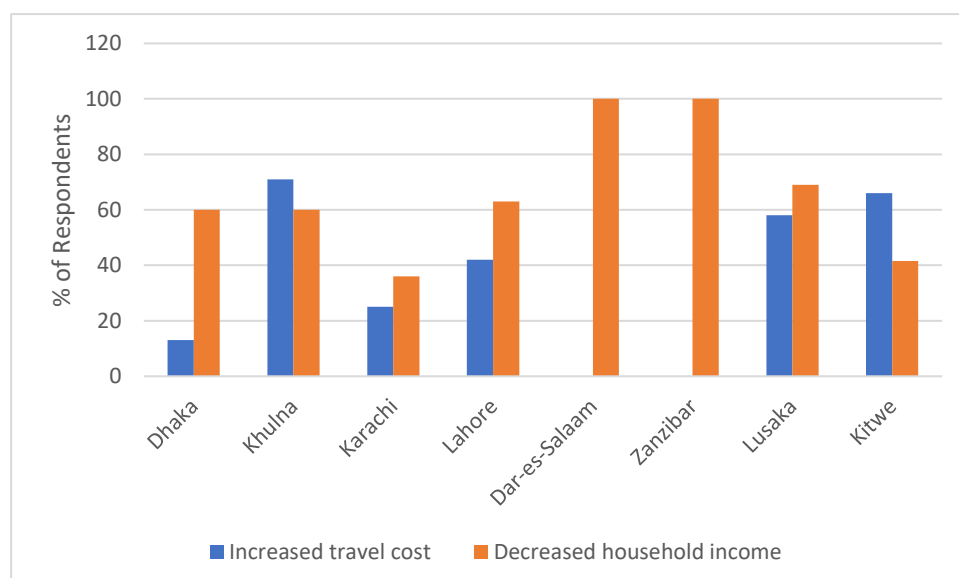
Travel and mobility of elderly and physically challenged people have changed due to COVID-19, as can be seen in Figure 31. The change was reported by 30%, 35%, 38% and 63% of the respondents in Khulna, Karachi, Lusaka and Kitwe, respectively. In Dhaka and Lahore, the change was reported by a lower number of respondents, 18% and 12% respectively. In Dar-es-Salaam only 2% of respondents reported change whilst the figure for Zanzibar was 0%. Many respondents in all the cities except Dar-es-Salaam and Zanzibar also mentioned that they are facing additional travel problems due to COVID-19.

Figure 31: Proportion of respondents changing travel or facing additional issues due to COVID-19



An increase in travel cost due to COVID-19 was reported by a proportion of the respondents in all the cities except in Dar-es-Salaam and Zanzibar. In Dhaka and Karachi around 15% experienced such an increase, whilst in Khulna, Lusaka and Kitwe the figure was around 60% and in Lahore around 40% (Figure 32). A large proportion of the respondents in all the cities mentioned that their household income has decreased due to COVID-19. Occupation has not changed for many respondents after COVID-19 because most of the respondents were not working before COVID-19, due to being elderly and/ or disabled people.

Figure 32: Proportion of respondents increased travel cost & decreased household income due to COVID





8.3.1 Trip frequency

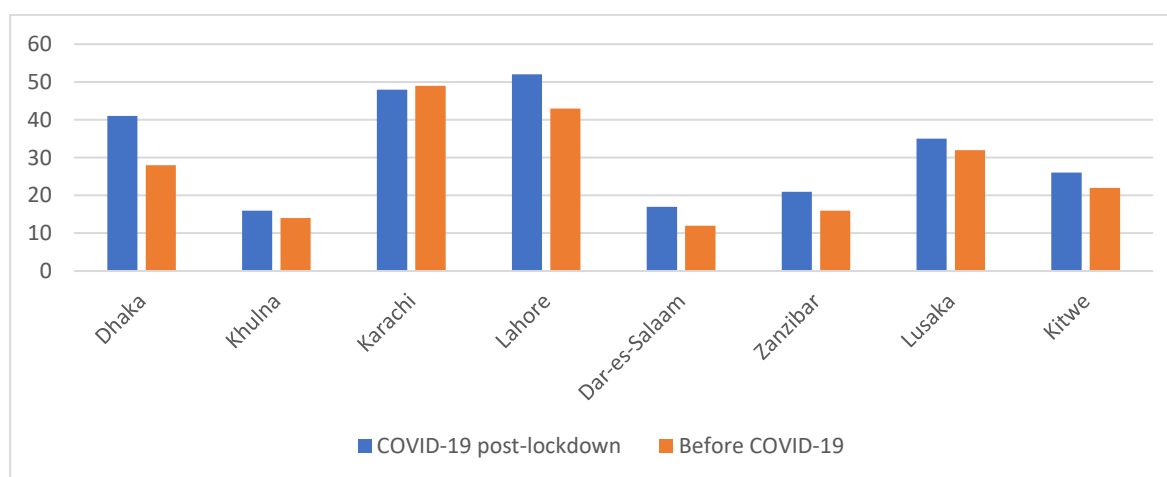
A reduction of trips was found in all the cities due to COVID-19. The major reduction was particularly during the lockdown when most of the respondents avoided travel and did not make any trips. They avoided travel either to remain safe from virus infection or due to the unavailability of public transport or due to the closure of business/ commerce institutions. However, only a very few in Lusaka and Kitwe avoided travel because there was no such strong lockdown with related traffic bans and enforcement. Nevertheless, for those who travelled during the lockdown, their frequency of travel was much less compared with before the COVID-19 situation. For instance, the travel frequency of many respondents in all the cities except Lusaka and Kitwe before the pandemic was 4-5 trips or 5+ trips per week, which decreased to once or 2-3 trips per week during the lockdown (as seen in Tables 41 and 43). The reduction of trips in Lusaka and Kitwe is not much as there was no such strong complete lockdown. Moreover, several respondents in Karachi, Lusaka and Kitwe made 4-5 trips or even 5+ trips per week during lockdown. In Karachi this was mainly due to respondents having a personal vehicle (and thus not being affected much by the lockdown). In Lusaka and Kitwe this was mainly due to respondents using buses and taxis, which were not banned.

During post-lockdown, the travel frequency of the respondents has increased compared to lockdown time. However, a reduction of trips was found in post-lockdown compared with before COVID-19 (as seen in Tables 41 and 45). For example, during post-lockdown the frequency of travel is 2-3 trips or 4-5 trips per week for a large portion of the respondents in all the cities. Several respondents travel more than 5 trips per week, though the proportion is less than the before COVID-19. In contrast, the proportion of the respondents who travel just for few times in a year or month or once per week is higher in post-lockdown than before COVID-19.

8.3.2 Accompanied

As can be seen in Figure 33, several respondents in all the cities are accompanied or escorted by another person during their travel. The proportion of the respondents who are accompanied for their travel during COVID-19 post-lockdown is higher than the before COVID-19 situation.

Figure 33: Proportion of respondents accompanied by another person during their travel



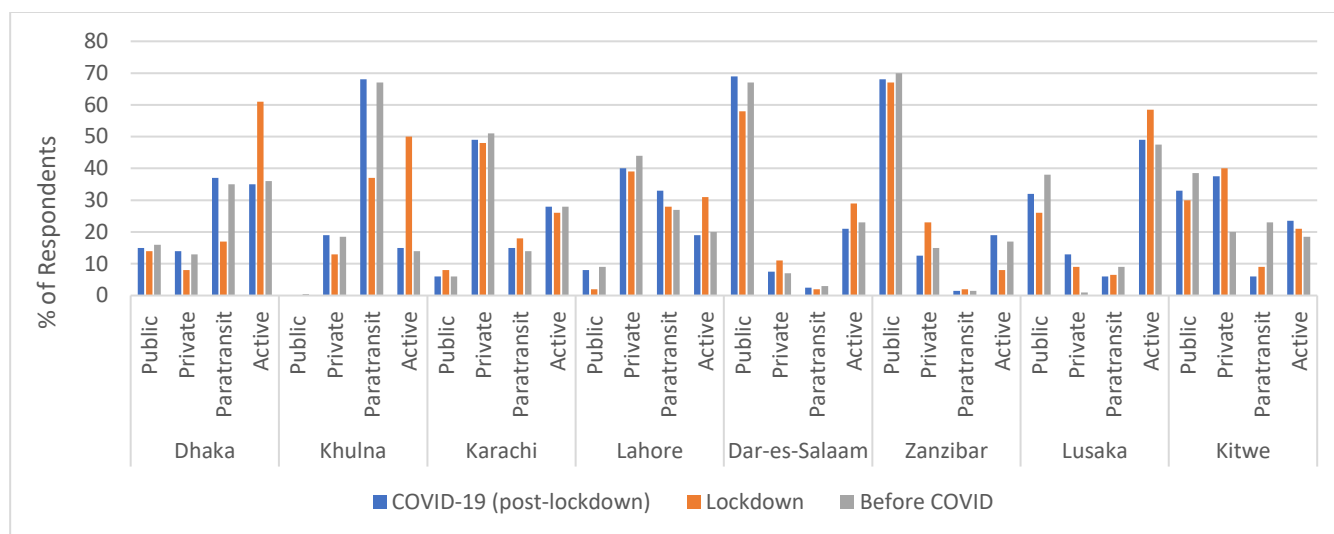
8.3.3 Mode of trip

As can be seen in Figure 34, the percentages of trips made by any mode before COVID-19 and after lockdown are generally similar in all the cities except for paratransit and private vehicles in Lusaka and Kitwe. A significant reduction in paratransit, but increase in private vehicles, is observed after lockdown in Lusaka and Kitwe in comparison to before COVID-19. Nevertheless, during post-lockdown, a slight decrease in usage of public transport and increase in private vehicles is observed in all the cities. During lockdown, the usage of public transport has reduced while active modes and private modes have increased compared with before COVID-19. The usage of paratransit modes during lockdown has increased in all the cities except in Dhaka, Khulna, Dar-es-Salaam and Zanzibar. The proportion of paratransit trips in Dhaka and Khulna has reduced because of traffic bans and strict enforcement, so that many operators were unable to drive during lockdown. On the other hand, in Dar-es-Salaam and Zanzibar the proportion of paratransit trips remained the same



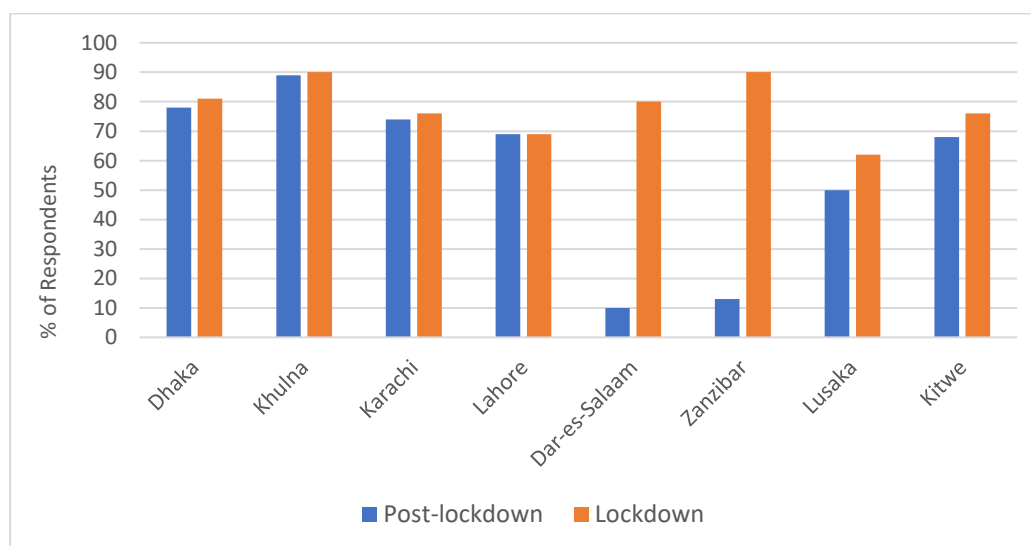
during and before COVID-19. Paratransit modes in many cities provided individual taxi-type services with higher fare both during lockdown and post-lockdown time.

Figure 34: Means of travel mode during and before COVID-19 in different cities



The effect due to COVID-19 over mobility was mainly affecting the people who do not own their private vehicle. Most of the respondents in all the cities mentioned that during lockdown they maintained proper physical distancing for their trips (Figure 35). However, the proportion of the respondents maintaining physical distancing in the post-lockdown period is slightly less compared to the lockdown period in most of the cities, while Dar-es-Salaam and Zanzibar it is very much less.

Figure 35: Proportion of the respondents in different cities maintaining physical distancing during travel



8.4 Travel difficulties of elderly and physically challenged people in LICs

Elderly and physically challenged people in LICs are facing a range of travel difficulties. Their travel difficulties are similar in all the case study cities. The usual travel problems before COVID-19 mentioned by the respondents can be summarised into two major groups: (a) overall transport problems of the city faced by everybody, and (b) the travel difficulties faced by elderly and physically challenged people for being disabled. These difficulties are:

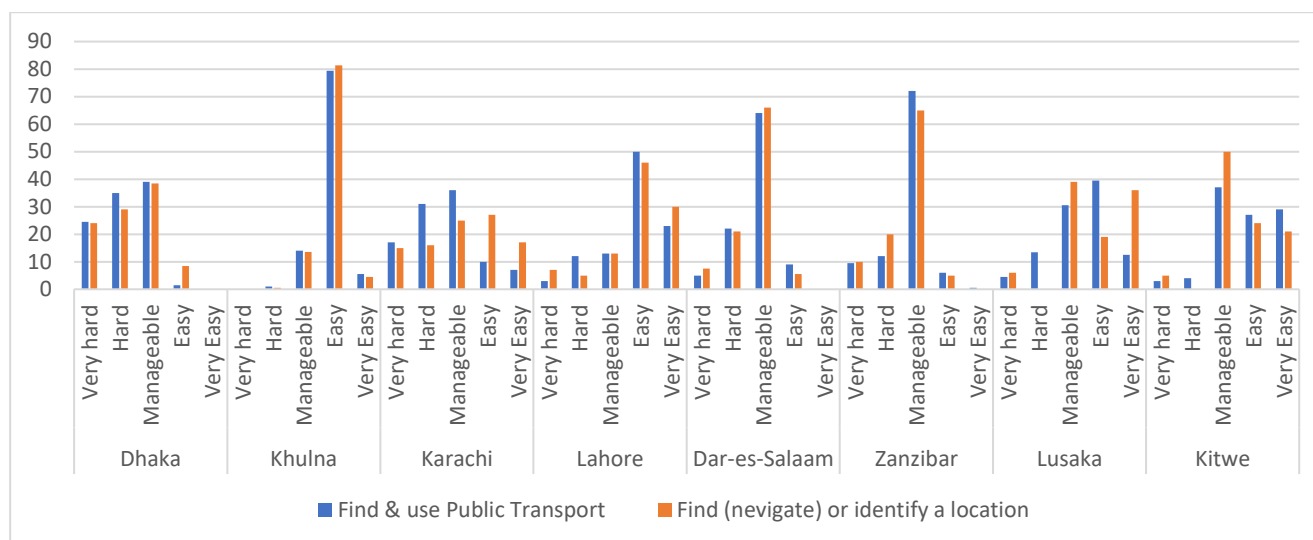
- Public transport is not accessible for physically challenged people, and no room for wheelchair users;
- No pedestrian paths, and existing paths or infrastructure are not accessible for disabled people;
- Less public transport facility, less variety of modes, poor public transport services;



- Traffic congestion and more travel time, air pollution, garbage on street;
- Difficulties of getting into bus, drivers not stopping buses properly.

In general, finding and riding on public transport or finding a location in LIC cities is not easy. Though the major proportion of the respondents in most cities found public transport 'manageable', a significant portion mentioned it is difficult or very difficult (Figure 36). Only in Khulna the majority mentioned that finding a public transport mode is easy because they can find an easybike anywhere of the city whenever they need a ride.

Figure 36: Level of difficulty to find public transport in different cities



Due to COVID-19 more travel difficulties are added for elderly and disabled people. The difficulties during lockdown and post-lockdown are similar, though a few additional problems occur due to restrictions or regulations imposed during lockdown. The added difficulties during lockdown are:

- Limited availability of public transport vehicles, so longer waiting time;
- Reduced travel due to imposed restrictions on travel and movement;
- More walk due to unavailability or limited public transport.

The additional travel difficulties due to COVID-19 during post-lockdown are:

- Reduced travel or fear of being infected by COVID-19 during movements out of home;
- Increased travel cost;
- Reduced seating capacity in bus for maintaining physical distancing;
- Wearing face mask is uncomfortable for breathing;
- Lack of compliance for maintaining physical distancing and wearing face mask or using sanitisation.

8.5 Reflections

Changes have been observed in mobility of the respondents in all cities due to COVID-19. The major changes particularly during the lockdown period, compared with before COVID-19, are avoiding travel or less frequency of trips. The proportion of social trips and recreation trips are less both in lockdown and post-lockdown compared to before COVID-19. However, the changes in travel and mobility of the respondents due to COVID-19 in different cities are associated with the nature of the lockdown or the response measures of the respective city. For instance, the changes in Bangladeshi and Pakistani cities are more than in Tanzanian and Zambian cities as there were effective lockdowns (travel bans) in the former. Frequency of trips reduced during COVID-19 and reduced significantly during lockdown.



Trip distance is short for the majority during COVID-19. Active modes such as walking and cycling as well as paratransit modes increased, while public transport usage reduced. Reduced availability of transport and increased travel cost (at the same time as reduced household income) occurred for many.



9. Conclusion and research uptake

9.1 Research uptake/ dissemination activities

To maximise benefits, as the research uptake strategy, the following activities will be organised:

- A Webinar to share initial findings with the stakeholders, academia and professionals;
- Disseminating the results in social media;
- A policy brief or summary factsheet.

A workshop will be organised in each city for strategic engagement of around 20 key local stakeholders (e.g. city authority personnel, policymakers, academics, transport providers) for disseminating the preliminary findings and validating the results. Considering the present health and safety issues due to COVID-19, the workshop will be organised virtually - using an online platform. A single workshop/ Webinar will be organised for all the cities where participants from different cities will join virtually.

A Webcast/ Podcast highlighting the major findings will be uploaded to social media (e.g. Facebook, LinkedIn) to reach the wider society. Similarly, a short video clip (around one or two minutes) about the summary of the research will be prepared and uploaded to social media.

A policy brief or summary factsheet will be prepared by June 2021 for disseminating the key results to the policy-makers of eight case study cities to make them aware about mobility needs and constraints of elderly and disabled people, as well as to guide them on responses and/ or recovery plans in a changed transport world due to COVID-19.

9.2 Low-income countries planned for upscale

This research has potential for scaling up from the case study cities in the four LIC delivery countries, namely Bangladesh, Pakistan, Tanzania and Zambia. The results will be helpful and transferrable to other cities of the four delivery countries as well as to neighbouring LICs, e.g. Afghanistan, Kenya, Malawi, Myanmar and Zimbabwe. Moreover, the methodology of this research could be applied in other countries across the globe. Thus, scaling up of the project will be possible regionally as well as globally.

The researcher in Bangladesh will collaborate with a particular municipality - KCC in Khulna - which was one of the case study cities in Bangladesh. The Chief Town Planner of KCC has already agreed to support the research and will take into consideration the results and suggested guidelines of this research while implementing relevant projects. Besides KCC, the research findings and suggested guidelines will be shared and pursued to the National Grassroot Disability Organisations (NGDO) - an NGO working for rights and betterment of physically challenged people in Bangladesh - and Dhaka Transport Coordination Authority (DTCA) in Bangladesh.

Similarly, research uptake activities in other cities, namely Karachi, Dar-es-Salaam, and Lusaka, will be carried out by the researchers in their respective cities. For example, the researcher from Karachi will be able to collaborate with Karachi Regional Transport Authority to facilitate the provision of transport infrastructure and services that are friendly for elderly and physically challenged people. The researcher from Tanzania will hand over a copy of this report to the Mayor of Dar-es-Salaam City Council and will advocate addressing the travel issues and problems faced by elderly and physically challenged people. The researcher from Zambia will discuss with a representative of Lusaka City Authority about initiatives to incorporate the issues of elderly and physically challenged people in projects related to urban development and transport planning.

9.3 Planned next steps

The planned next steps before October 2021 are:

- Presenting the major findings in a conference (online); and
- Submission for a peer-reviewed journal publication.



Possible conferences could be TRANSED (International Conference on Mobility & Transport for Elderly and Disabled Persons) or EASTS (Eastern Asia Society for Transport Studies), while the possible journals could be TRB Transport Research Record (TRR), Transportation Research Part A or Case Studies on Transport Policy.

9.4 Conclusion

The travel behaviour of elderly and physically challenged people are different to those of physically enabled and young people. Some problems related to their mobility are different than those faced by physically enabled and young people, whilst other problems are similar. The COVID-19 pandemic has had a profound impact on the mobility of all groups. The main purpose of the research reported above was to understand the mobility of physically challenged and elderly people in LICs during the COVID-19 pandemic, especially concerning their main travel problems due to COVID-19 with case studies in eight LIC cities.

The outcome of this research will have a beneficial impact on transport in the target LICs and cities. For instance, the results will be helpful for policy formulation to improve mobility and thus provide better access to transport and services for elderly and physically challenged people, both during COVID-19 and post-COVID-19 periods. The suggestions of this research will be helpful in addressing social inclusion and equity issues in transport planning and policy formulation. Thus, the lives of elderly and persons with disability will be improved. The results will be helpful for city authorities and governments for making policy decisions, formulating strategies and making investment plans.

The research provides an avenue for further research on various topics. One such topic could involve developing a tool for rapid assessment of urban transport infrastructure and public transport services in LIC cities to ascertain whether they are friendly for elderly and disabled people. Another topic could involve undertaking a demonstration project to showcase good practices for elderly or disabled friendly transport.



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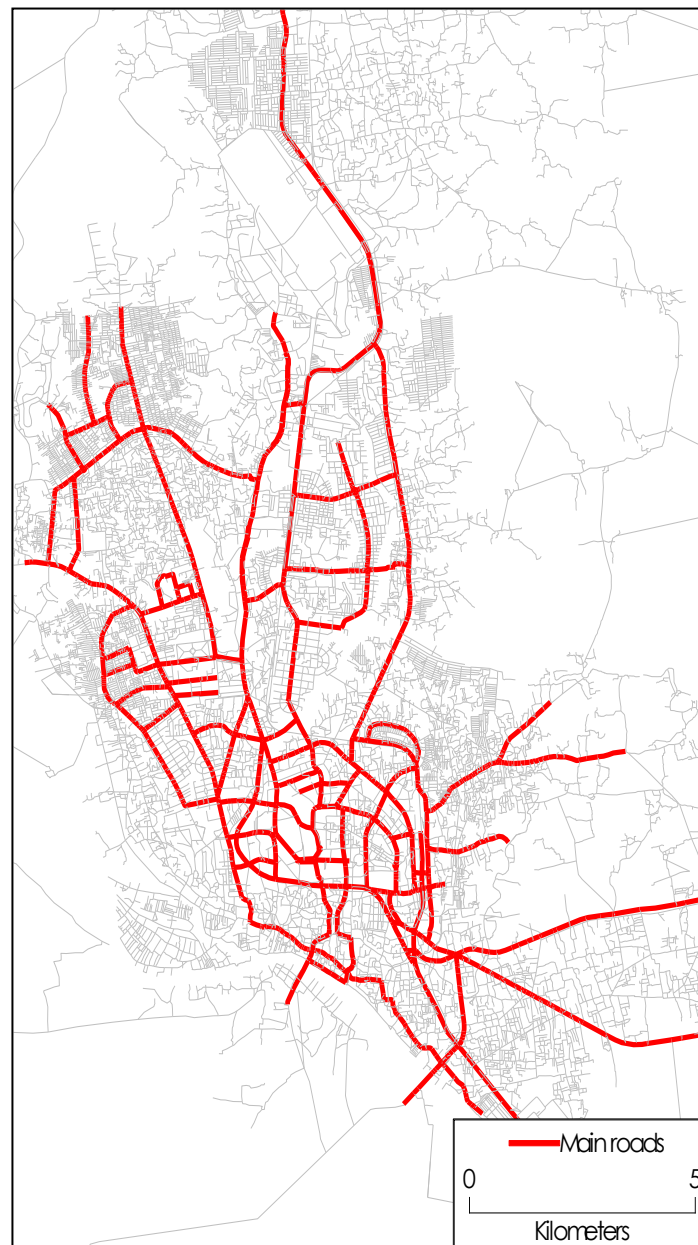
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APPENDIX A: CITY PROFILE / DESCRIPTION OF THE CITY

A1. DHAKA CITY (BANGLADESH)

Dhaka, the capital city of Bangladesh, is one of the highly dense cities of the world with 10,484 persons per sq.km. Total land area of the city is 1,528 sq.km and the population is 14.5 million with male female gender ratio 113.

Figure A1. Map of Dhaka city with existing public transport routes



Transportation system in Dhaka is road-based and the role and contribution of railway or water transport is very minimal in terms of passenger transport. Total length of road network is 1,296 km of which 44% is narrow road (DTCA, 2019). Dhaka is one of the least motorised cities in the world with approximately 30 motorised vehicles per 1,000 population (STP, 2005). However, the traffic volume is very high; the motorised vehicles in major roads and rickshaws in local or narrow streets (Rahman, 2013). At present buses are the only available public transport mode in Dhaka; yet no metro or bus rapid transit (BRT) system available. Modal share of trips in Dhaka city in 2015 are (RAJUK, 2016): car (7.22%), bus (36.97%), rickshaw (37.69%), others (0.001%), rail and water transport (0.003%), and walk (17.73%).



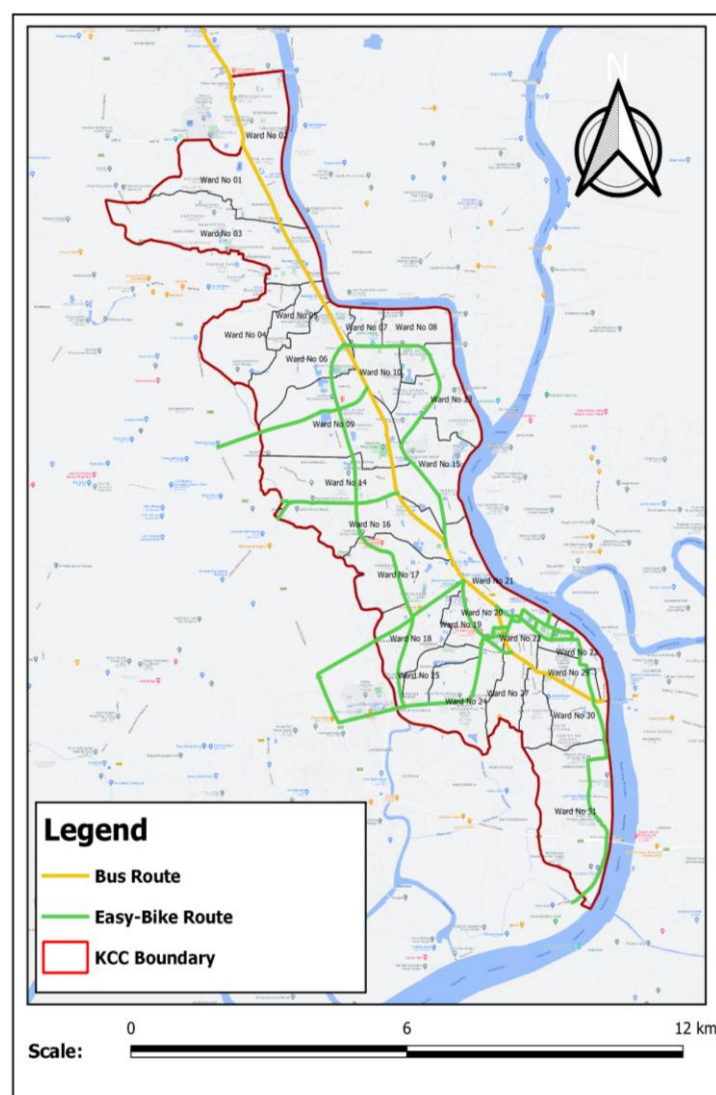
Bus service in Dhaka is very poor; mostly overcrowded and women or disadvantaged people do not have easy access (Rahman and Nahrin, 2012). A variety of informal travel modes or para-transit are available in Dhaka. The rickshaw is a common and widely available mode in Dhaka; at present there are almost 600,000 rickshaws are available for hire (Rahman, 2013). Average trip time is 45 minutes, and the speed of motorised vehicles reduces to only 6.5 km/ hour during peak hours and average length of the bus trips is 5.8 km (Rahman, 2013).

A2. KHULNA CITY (BANGLADESH)

Khulna, the 3rd largest city in Bangladesh, is in the southern part of the country. Total land area of Khulna city is 45.65 sq. km (Roy, et al. 2018), and population 1.5 million (Kabir, 2019) with male female ratio 108. Total length of road network in Khulna city is 640 km (KCC, 2020). Existing road infrastructure such as the walkways and road intersections are poorly designed and managed. The major roads of the city often remain congested due to haphazard parking or stopping of buses and easy-bikes.

Public transport system in KCC is very limited. Existing city bus service available only in one route – between Rupsha Bus Station and Fultola Bus Station – about 23 km. Bus services are very limited and poor. As a result, the number of easy-bikes increased rapidly during the last few years. The number of registered easy-bikes and rickshaws in KCC is 8,000 and 17,000 respectively (KCC, 2020). Average trip speed on bus, car and auto-rickshaw is 41 km/h, 52 km/h and 28 km/h respectively (KDA, 2018). Modal share of trips in Khulna are: easy-bike (37%), rickshaw (18%), motorcycle (11%), bicycle (5%), walking (21%) (Kabir, 2019). Bus ridership average in is 28% with average trip distance 2 to 3 km (Kabir, 2019).

Figure A2. Map of Khulna city with existing public transport routes



A3. KARACHI CITY (PAKISTAN)

Karachi is one of the megacities of Pakistan located in the south of Sindh province that connects Pakistan with waterways via the Arabian Sea. The city consists of total area 3530 sq. km surrounded by Dadu, Thatta and Lasbela districts in north, northeast and northwest direction respectively (Mangi et. al. 2020). The population of Karachi is more than 20 million, which is estimated to be 31.6 million in the year 2030. There are five districts of Karachi further divided into 18 towns and 6 cantonments with 1300 sq. km of developed area (Qureshi, 2010; Shibuya, 2012). Being the financial hub of the country, Karachi generates around 10-15% of GDP for Pakistan (Ellis et. al. 2018; Hasan, 2016).

Figure A3. Map of Karachi showing the distribution of towns (Shaikh & Ali, 2016)

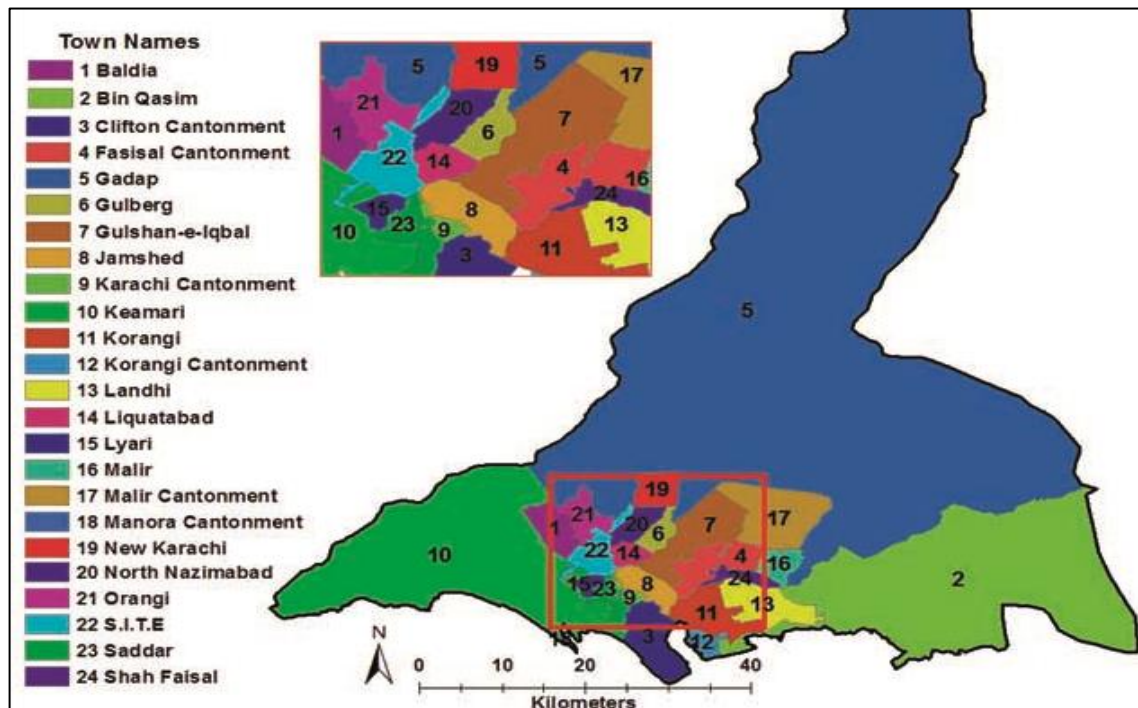
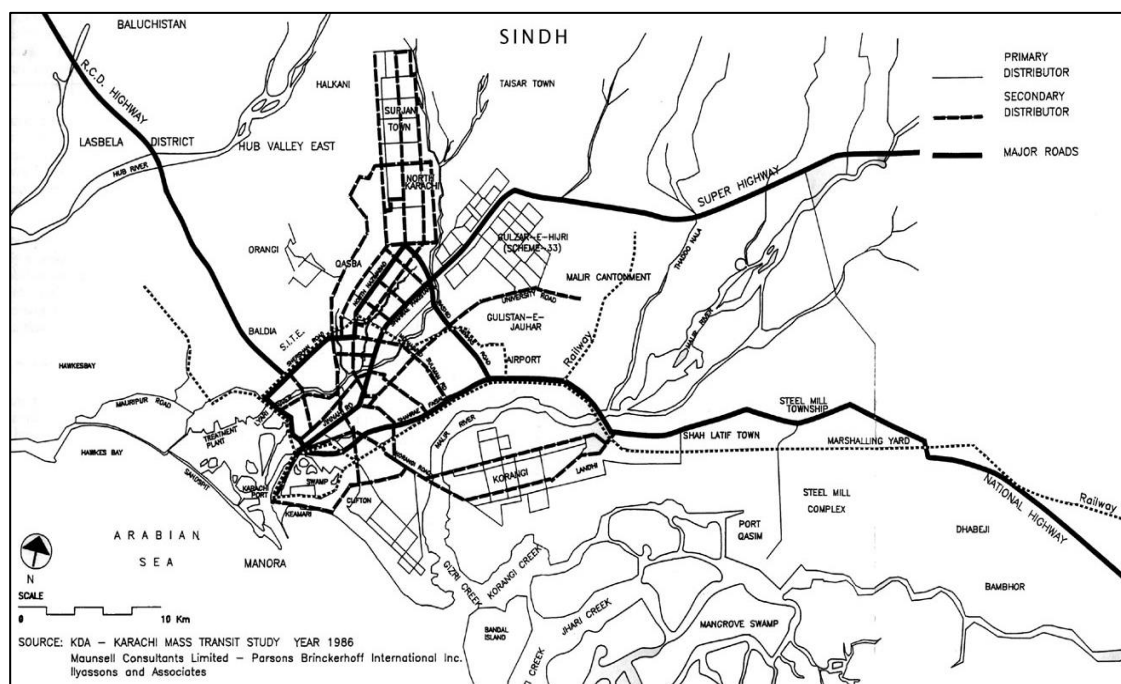


Figure A4. Road Network of Karachi showing major arterials and distributors (Hasan & Raza, 2015)

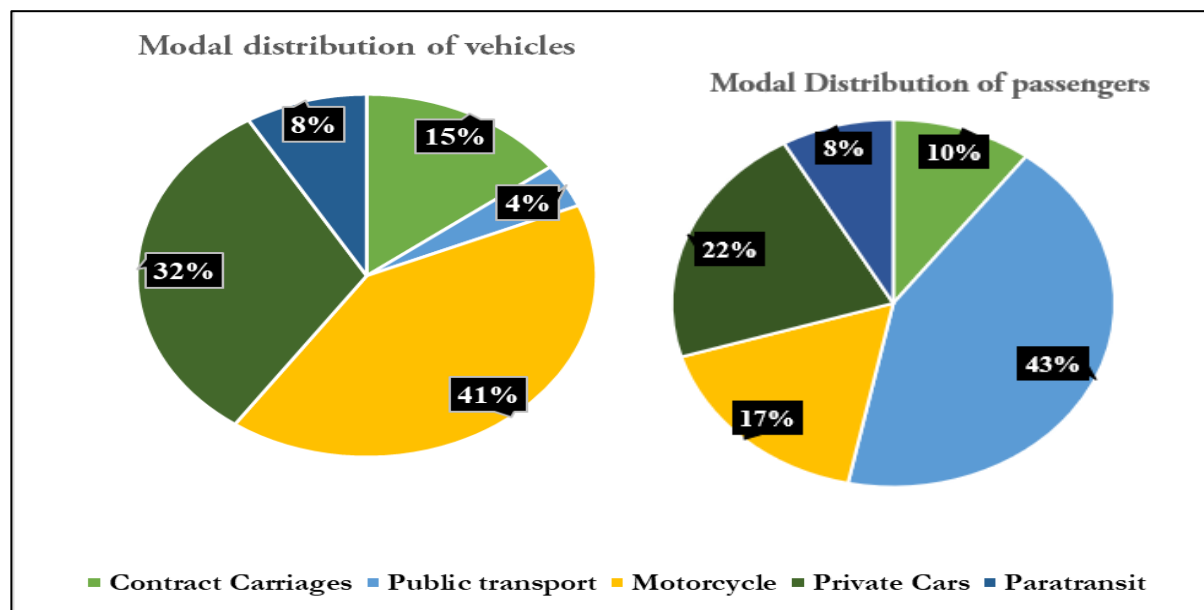




The transportation network of Karachi comprises mainly of road-based specially for intra-city travel while it also includes air, water, rail-based systems. The road network of 10,000 km length that consists of 93% of local roads and less than 5% of major arterial in Karachi includes three highways (Super-Highway M-9, National Highway N-5, RCD highway N-25), six arterials (Korangi Road, Shahrah-e-Faisal Road, University Road, Shahrah-e-Pakistan Road, Chaudry Fazal Ellahi Road, and RCD Highway) and one expressway (Lyari Expressway) that connects north and south directions (Shibuya, 2012).

The Jinnah International Airport in Karachi is one the busiest airports in Pakistan serving approximately 6,212,485 passengers each year. Rail in Pakistan is mainly used as inter-city travel by Pakistan Railway and there are a few railway tracks in Karachi. The intra-city rail existed in Karachi in 1969 but not operational in recent era. The government is working on for rehabilitation of Karachi circular railway (Shibuya, 2012).

Figure A5. Modal split for distribution of vehicles (left) and passengers (right) (Hasan & Raza, 2015)



The public transport in Karachi mostly consists of informal vehicles including Chingchi, minibuses and buses. The routes for these modes are designed by private sector and approved by Regional Transport Authority (Noman et. al. 2020). Of the road traffic composition in Karachi, almost 83.8% are private vehicles that carry only 37.6% of trips while only 4.5% are public transport vehicles serving around 42% of trips.

A4. LAHORE CITY (PAKISTAN)

Lahore is the second-most populous city (density 7,000 persons/km²) of Pakistan and situated in north-eastern province Punjab. According to Pakistan Bureau of Statistics, the total population of Lahore is 12.6 million; with the growth rate of 4.04% expected to be 22 million by 2025. The area of Lahore is about 1,772 km² and as of 2017 the estimated GDP \$127 billion. Lahore District is a subdivision of the Punjab and is further divided into nine administrative zones.

The transport system in Lahore is mainly consisting with following: Lahore mass transit projects; road transport (e.g. rickshaw and taxi); railways; airport. Lahore Mass Transit projects are: Metro bus system; Orange Line; Blue Line; Purple Line (SkyscraperCity, 2020).



Figure A6. Map of Lahore (left) and town wise Division (right)

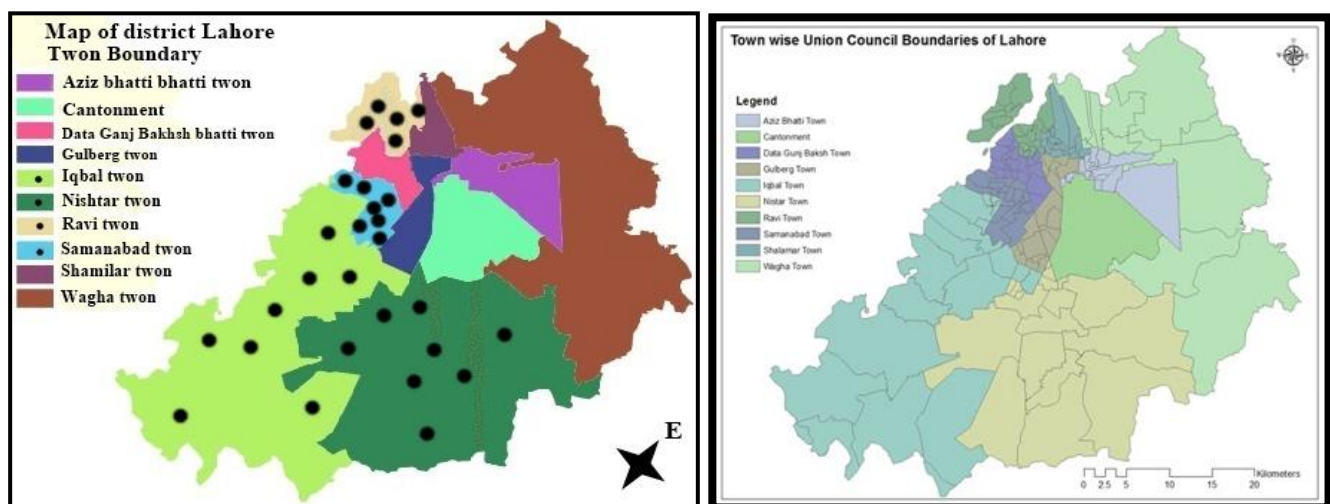
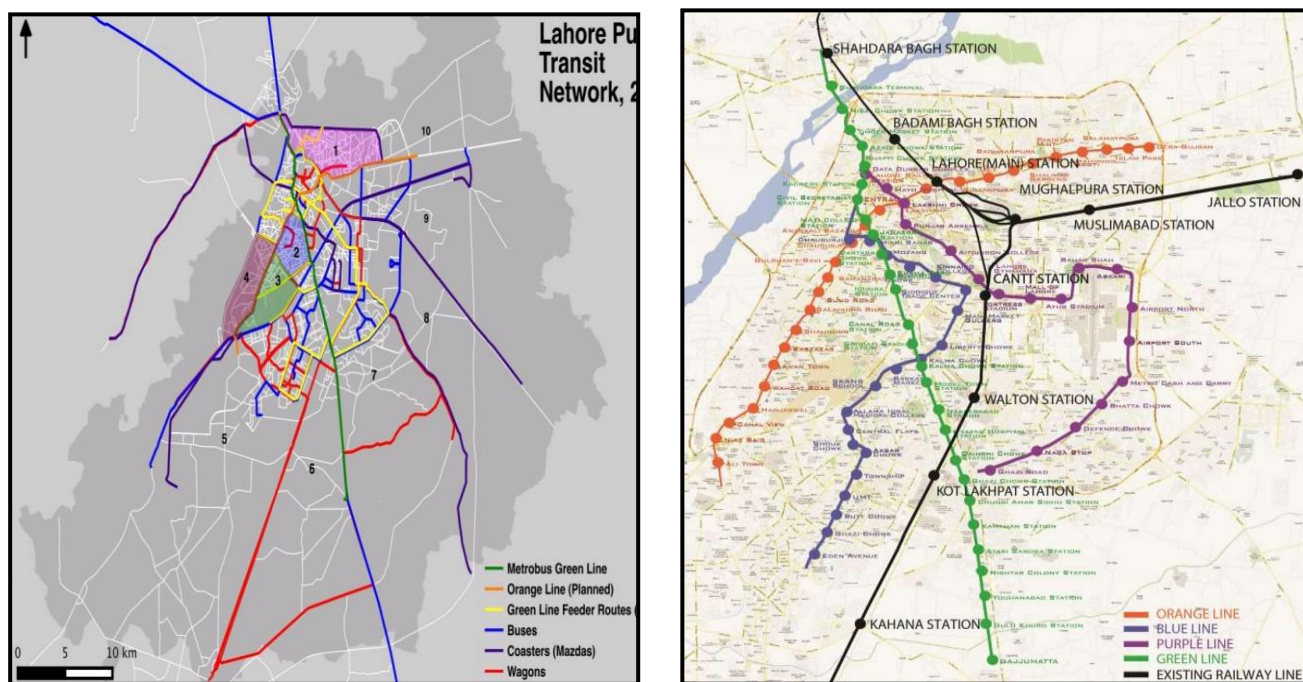


Figure A7. Lahore Public Transit Network (left); Lahore Mass Transit Projects (right)



PMA runs the entire Lahore Metrobus Service (MBS) along with all its connecting feeder buses. Lahore Metrobus Service has become the primary mode of transport now for many locals after it became operational in February 2013. It is the first Bus Rapid Transit (BRT) system of its kind in Pakistan.

Orange Line Rail Mass Transit System (LRMTS) is the Pakistan's first metro train service has been officially inaugurated on 25 October 2020. This Orange Line of Lahore Metro covers 27 km with 26 stations both elevated and underground, expected to offer a quick commute to around 250,000 passengers daily. Blue line is a proposed project that will cover 24 km from Chauburji Chowk to College Road. Purple line is another project for Lahore, becoming an airport to rail link over 32 km.

Uber and Careem are available in the city. They need to be booked in advance by App. Motorcycle ride is also available which have been introduced by private companies. Local and auto-rickshaws are also available for ride on low prices. The major hub for all Pakistan Railway services in northern Pakistan is Lahore Junction Station. It includes services to Peshawar and national capital Islamabad-Rawalpindi, and long-distance services to Karachi and Quetta. The main public transportation system Lahore is operated by the Lahore Transport Company (LTC) and Punjab Mass Transit Authority (PMTA). There are many options for public transportation within Lahore; people choose the type of transportation as per priority of that time for them.

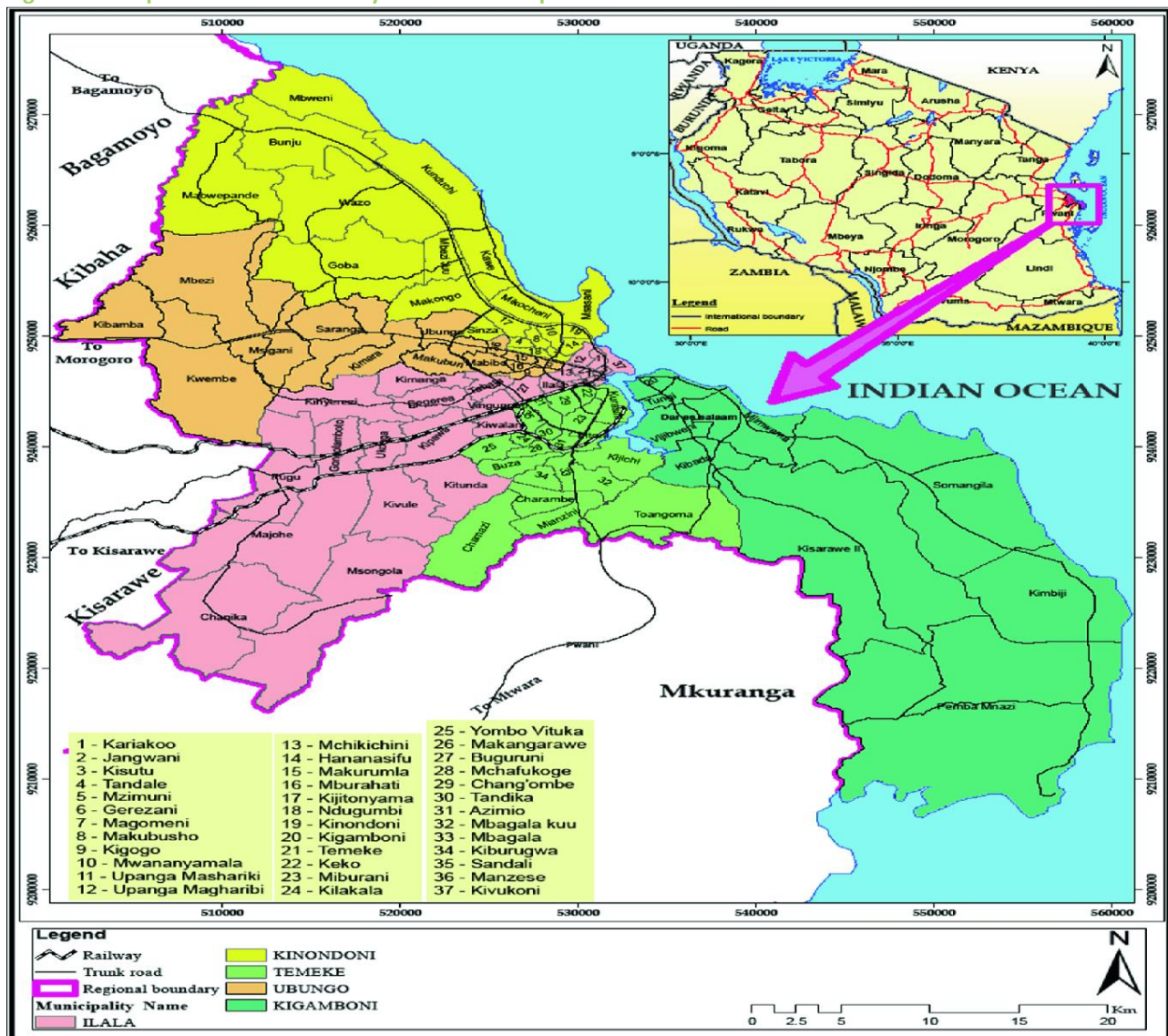
Figure A8. Feeder Bus 15 Heading towards Bhatti Chowk (left); Test Run of Lahore Orange Line Metro (right)



A5. DAR-ES-SALAM CITY (TANZANIA)

The city of Dar-es-Salaam, one of the fastest growing cities in the region and the world, has a total surface area of 1,393 sq. km.

Figure A9. Map of Dar-es-Salaam City and the Municipalities





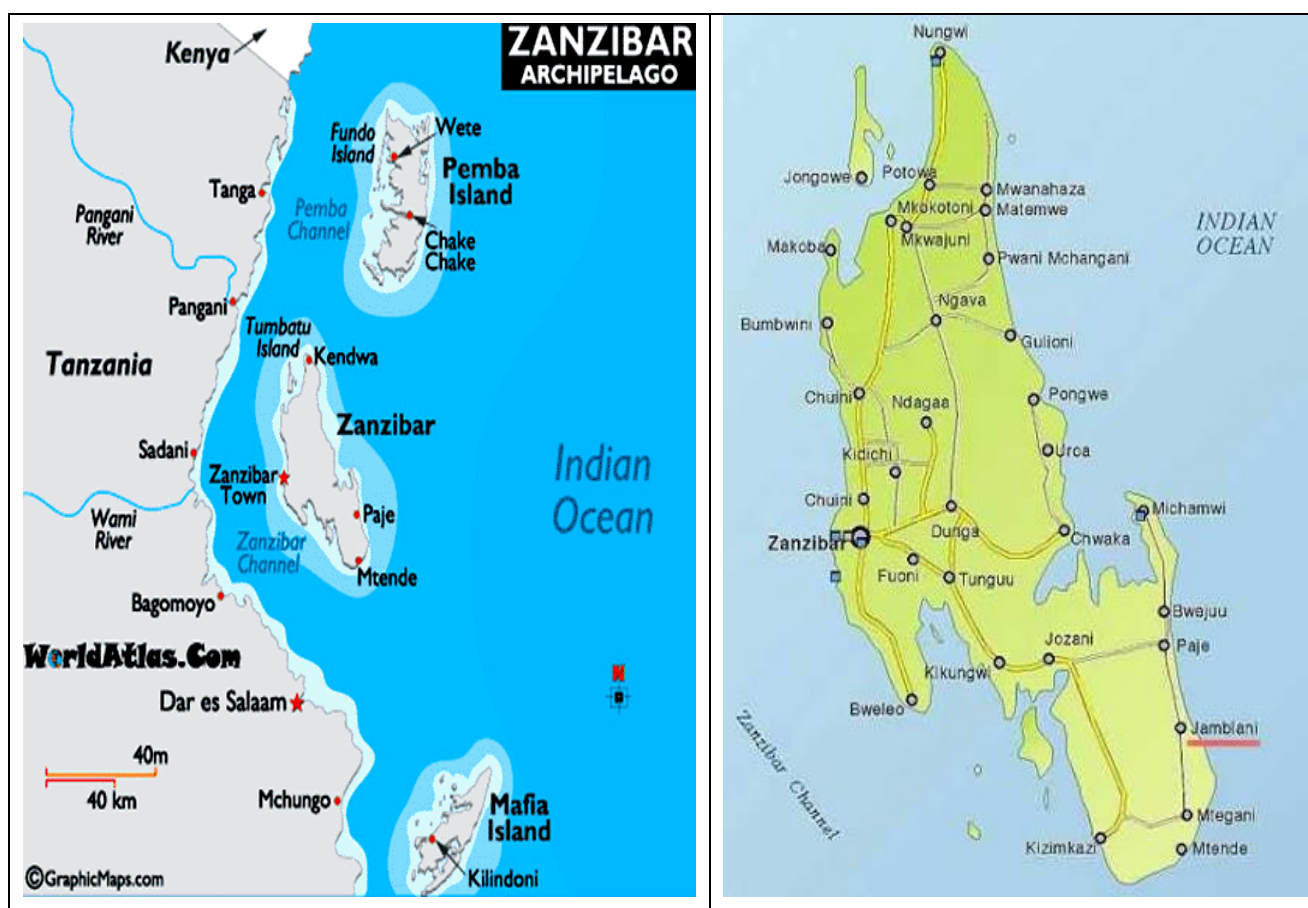
According to the 2012 population census, the city had a population of 4.36 million which is estimated 6.7 million in 2020. Gender ration of the city is 48.7% male and 51.3% female. It is the major city of Tanzania and the hub of commercial activities. There are more than 575 major industrial establishments in Dar-es-Salaam.

Administratively, Dar-es-Salaam has a regional administration headed by the Regional Commissioner and a City Council administration headed by the Mayor of Dar-es-Salaam. The city has five municipal councils (Temeke, Kinondoni, Ilala, Ubungu and Kigamboni) and by their embedded administrative functions they form municipals of the Dar-es Salaam Region. The city has established Bus Rapid Transit (BRT) systems in 2012 and since 2016 operating by the government agency Dar-es-Salaam Bus Rapid Transit Agency (DART).

A6. ZANZIBAR CITY (TANZANIA)

Zanzibar Island is a semi-autonomous region of Tanzania. It is composed of the Zanzibar Archipelago in the Indian Ocean, 25–50 km (16–31 miles) off the coast of the mainland and consists of many small islands and two large ones: Unguja (the main island, referred to informally as Zanzibar) and Pemba Island.

Figure A10. Map of Zanzibar



Zanzibar City is a capital of Zanzibar. It's located on the West Coast of Unguja on the main Island of Zanzibar. The population of Zanzibar city estimated to be more than 700,000 in the 2020 (Macrotrends, 2020), which makes it by far the largest settlement on the islands of Zanzibar, and the sixth largest in Tanzania. Zanzibar city comprises of two main parts, Stone Town and Ng'ambo (literally The Other Side). Stone Town is the historical core of the city, former capital of Zanzibar Sultanate; as because of its unique architectural and culture it was declared as UNESCO World Heritage Site in 2000. Ng'ambo is the much larger area, modern area that developed around Stone Town soon after Zanzibar Revolution. Tourism in Zanzibar is a more recent activity, driven by government promotion that caused an increase from 19,000 tourists in 1985, to 376,000 in 2016 (Glenn-Marrie, 2015).

A7. LUSAKA CITY (ZAMBIA)

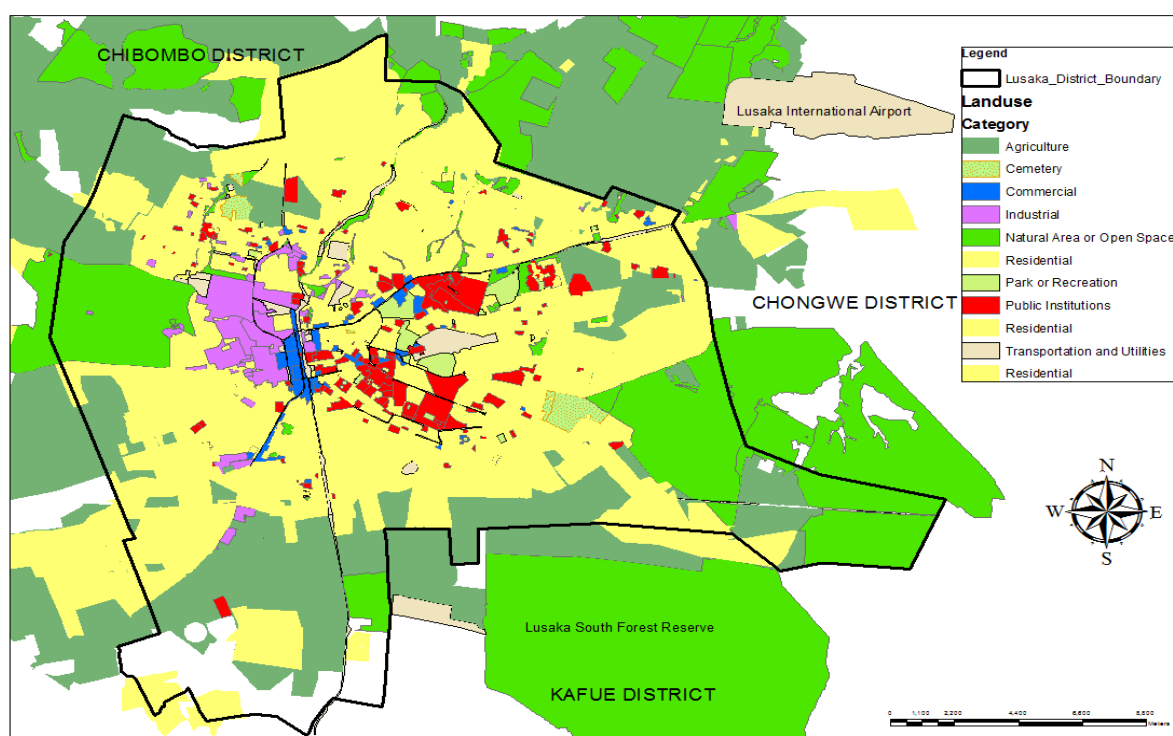
Zambia is one of the most urbanised countries in Sub-Saharan Africa with almost 46% of the population living in towns. Lusaka is Zambia's capital, and largest commercial and political centre. The total population of



Lusaka city is now over 2.8 million, which has been doubled in the last decade, and is projected to rise to 5.1 million by 2035 (UN-Population Data).

Currently, over 70% population in Lusaka live in informal settlements and peri-urban areas, which are absorbing most of the urban growth and characterised by poor living conditions and major health threats (UN-Habitat 2012). Most of the residents' face threat of eviction and are vulnerable to the absence of clean water and adequate sanitation facilities, absence of adequate waste disposal as well poor road network. Lusaka is characterised by lack of serviced land, high competition and prices for land, political interference in the land market, complicated and bad-kept record for land usage, slow issuing of land titles and occupancy licenses, and proliferation of slums (UN-Habitat 2012).

Figure A10. Map of Lusaka city (Hampwaye, et. al. 2016)



Urban development in Lusaka has been driven by population growth, increased expenditure in infrastructure (roads in particular), and a booming real estate sector. The United Nations Department of Economic and Social Affairs considers that existing development plans fail to accommodate and integrate 65% to 70% of urban residents living at the margins in unplanned settlements (Li and Siame 2020). Thus, Lusaka's urban structure and form is characterised by large swaths of informal settlements, rapid growth of gated communities on the edges of the city and along arterial road, and rapid disappearance of farmland and green spaces.

The transport sector has played a pivotal role in enabling economic growth and human development. Transport infrastructure has been provided by the public sector, often with the support of international development partners. However, public transport services depend almost exclusively on the private sector. To maintain its economic growth trajectory, Zambia needs to adapt its transport infrastructure and services to meet the needs of an increasingly urban economy.

The transport system in Lusaka has been overrun by a rapid increase in demand and is highly inefficient – resulting in severe congestion and urban inefficiency. The rate of urbanisation and rise of vehicle ownership has outstripped the capacity of existing transport services and infrastructure. Urban expansion has physically surpassed the city administrative boundary and spilled into adjacent areas, engulfing nearby suburbs and absorbing semi-urban areas and rural hinterlands. The congestion is further compounded by a growing suburban lifestyle where gated communities are becoming increasingly common. The lack of reliable non-motorised transport infrastructure also hinders efficient urban mobility, as over a quarter of trips are made on foot. The compounded challenge of urban transport has been attributed to triple factors, namely, rapid

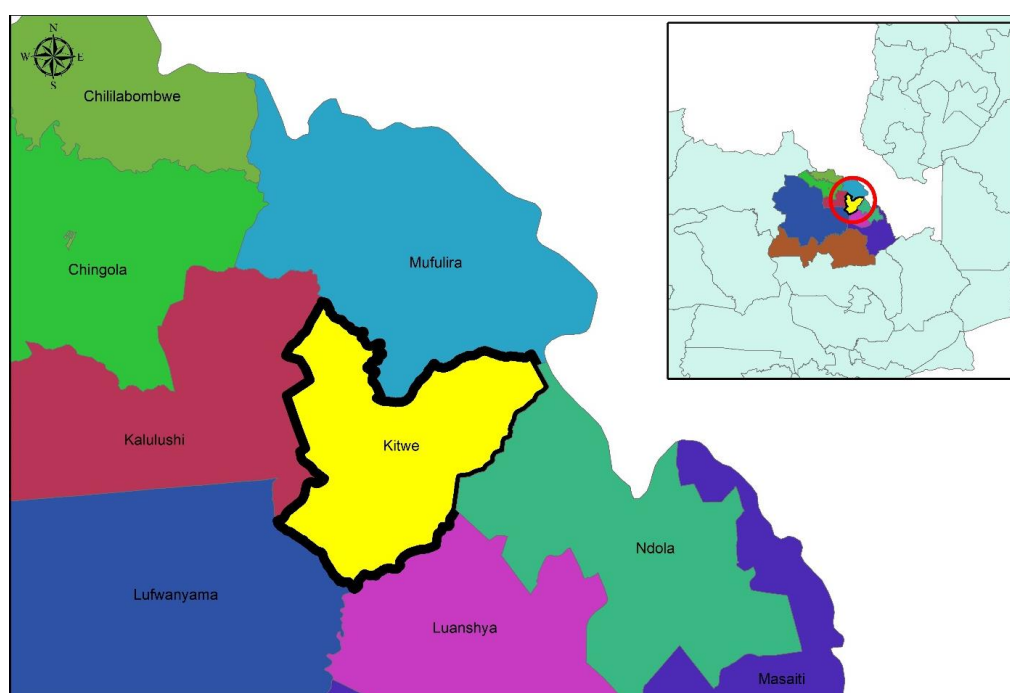


population growth, fast rising suburbia cultures and lack of an integrated urban transport system and infrastructure. The result has been, over 65% of Lusaka population has no daily access to motorised means of transport.

A8. KITWE CITY (ZAMBIA)

Kitwe is a trading centre and a mining hub in the Copperbelt province of Zambia and the second largest city of the country. Kitwe's development as a city began with the discovery of rich sulphide ore deposits at Nkana by the Bwana Mkubwa Company in 1927. Like most urban centres on the Copperbelt of Zambia, urban growth of Kitwe has followed the presence of mining activities. However, several unplanned settlements have been formed in the city as those could not be absorbed into the formal housing system. According to the 2010 Census, population of Kitwe has been estimated about 0.52 million. The average annual population growth rate for the district is 3.2% and is the most densely populated city in Copperbelt Province at 666.1 per sq. km (CSO, 2010).

Figure A11. Location map of Kitwe city in the Copperbelt Province



The city has however experienced growth as a result of emerging service industry supplying the mines and other retail and manufacturing activities. Real estate has also become another engine of growth for the city. The presence of the country's second largest university – Copperbelt University – has contributed to the growth of the city's property investments and other establishments such as shopping malls and office parks. However, the City continue to have a poorly developed transport systems, with small buses being the most used for getting around in the city.



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APPENDIX B: NEIGHBORHOOD LOCATIONS OF HOUSEHOLD SURVEY

Dhaka, Bangladesh (2-12 November 2020)

1. Uttara 11 & 7
2. Uttara Azampur: Sector 6 - Uttar Khan – Chalaban - Dakkhin Khan
3. Nikunjo - Khilkhet
4. Basundhara – Banani - Baridhara
5. Baddah - Rampura
6. Khilgaon – Goran - Basabo
7. Malibagh - Mogbazar
8. Sayedabad - Jatrabari
9. Sanir Akhra - Dania
10. Zurain – Dhulaipar - Muradpur
11. Old Dhaka: Wari – Narinda - Sutrapur
12. Old Dhaka: Bongsal – Armanitola - Lalbagh
13. Aarambag – Tikatuli – Komolapur Quarters
14. Fakirapul- Polton - Shantinagar
15. Azimpur – Polashi - DU
16. Jigatola - Hazaribag
17. Dhanmondi – Kolabagan - Lalmatia - Mohammadpur
18. Shamoli – Shekhertek – Ring Road Housing Baidul Aman
19. Shewrapara – Kazipara – Monipur – Pirer Bag
20. Kathalbagan – Poribag - Tejkunipara
21. Cantonment: Kochukhet – Kafrul - Ibrahimpur
22. Cantonment: Banani DOHS & Baridhara DOHS
23. Kollyanpur - Tolarbag – Paikpara
24. Mirpur 2 & 6
25. Mirpur 11 & 12
26. Mirpur Pallabi – Duari para – Eastern Housing
27. Kalshi Slum
28. Gulshan Slum
29. Syedabad Doyaganj Swiper colony
30. Mohammadpur Ring Road slum
31. Mirpur 14 CRP slum

Karachi, Pakistan (2-20 November 2020)

1. Bin Qasim
2. Clifton- DHA Phase 1
3. Clifton- NHS Zamzama
4. Gulshan- Saima Classic
5. Gulshan- Gulzar e hijri
6. Gulberg- Azizabad
7. Gulberg- Ancholi
8. Saddar- Garden
9. Saddar- Aram Bagh

Khulna, Bangladesh (7- 18 November 2020)

1. Fullbari Gate
2. Shenpara
3. Munshipara
4. Religate
5. Moddhodanga
6. Doulatpur Residential Area
7. Doulatpur Industrial Area
8. Islambag
9. KDA Residential Area
10. Khalishpur Housing State
11. Goalkhali Residential Area
12. Navy Staff Quarters
13. Mujgunni Residential Area
14. Khalishpur Residential Area
15. Rayer Mahal
16. Boro Boyra
17. Sonadanga Residentail Area Phase 1
18. Sonadanga Residentail Area Phase 2
19. Boyra
20. Mohammadnagar
21. Seikhpura
22. Bosupara
23. Goborchaka
24. East Baniakhmar
25. West Baniakhmar
26. Banorgati
27. Farazipara
28. Nirala Residential Area
29. Bagmara
30. Munshipara
31. West Tootpara
32. South Tootpara
33. Jinnahpara
34. Lobonchora
35. Jorakol Bazar

Lahore, Pakistan (4-20 November 2020)

1. Ravi Town-Lajpat Road
2. Ravi Town - Rehman Garden
3. Ravi Town - Shahdara Mor
4. Gulberg Town- Shahdara Station
5. Gulberg Town - Bagbanpura
6. Gulberg Town – Naseerabad
7. Nishtar Town- Sufiabab
8. Nishtar Town - Crest Road
9. Nishtar Town - Nor Masjid



10. Orangi- Islam Nagar
11. Orangi- Sector 15-C
12. Korangi
13. Jamshed Town- Mehmoodabad
14. Jamshed Town-Tareq Road
15. Liaquatabad
16. Landhi
17. North Karachi- Anda Mor
18. North Karachi- Sector 11B
19. Lyari- Minawali Colony
20. North Nazimabad- Gol Market
21. North Nazimabad- Shadman
22. Malir Cantonment
23. Gadap
24. Shah Faisal- Sadat Colony
25. Model Colony, Malir
26. Goth Laji Salar, Kiemari

10. Shalamar Town- Bagbanpura
11. Shalamar Town- UET
12. Shalamar Town- Sing Pura
13. Wagha Town- Muhammad Nagar
14. Wagha Town- Baseen
15. Aziz Bhatti Town- Islam Nagar
16. Aziz Bhatti Town- Tajpura
17. Aziz Bhatti Town- Fatehgarh
18. Data Ganj Bakhsh Town- Sunat Nagar
19. Data Ganj Bakhsh Town- Anarkali
20. Data Ganj Bakhsh Town- Islamia College
21. Iqbal Town- Babu Sabu
22. Iqbal Town- Sabzazar
23. Iqbal Town- Racecourse
24. Samnabad Town- Wahdat Colony
25. Samnabad Town- Chauburji
26. Samnabad Town- Rasool Park

Dar-es-Salaam, Tanzania (9-28 November 2020)

1. Survey
2. Mlalakuwa
3. Mwenge
4. Makongo
5. Magomeni
6. Mwananyamara
7. Sinza
8. Mawasiliano,
9. Manzese
10. Kimara
11. Tabata Shule
12. Segerea
13. Riverside
14. Msewe
15. Buza
16. Chang`ombe
17. Buza
18. Tandika
19. Nasa "B"
20. Kilimahewa
21. Devis Conner
22. Keko
23. Gongo la Mboto,
24. Mbagala
25. Buguruni
26. Gerezani
27. Kariakoo
28. Mchafukoge
29. Posta
30. Kigogo
31. Tegeta
32. Mbezi juu
33. Mbezi beach
34. Mbezi Makonde
35. Tegeta Kunduchi
36. Tegeta Kibaoni

Zanzibar, Tanzania (11 Nov – 5 December 2020)

1. Bububu
2. Kisakasaka
3. Kwarara
4. Kisauni
5. Kwamani
6. Mabatini
7. Legeza mwendo
8. Mtopepo
9. Mwera
10. Stone town
11. Jitimai
12. Skuli
13. Taveta
14. Sai
15. Mzalendo
16. Mpendae
17. Kwa Mchina
18. Jang`ombe
19. Amani
20. Welezo
21. Kichangani
22. Kijangwani
23. Tunguu
24. Kilimahewa
25. Kiembe samaki
26. Sahuri Moyo
27. Darajani
28. Kwerekwe
29. Saateni
30. Tomondo

**Lusaka, Zambia (18-25 November 2020)**

1. 10 Miles
2. Chaisa
3. Chawama
4. Chazanga
5. Chilenje
6. Chipata Township
7. Emasidale
8. Fairview
9. Garden
10. George Compound
11. Jack Compound
12. John Howard
13. John Laing
14. Kabanana
15. Kabwata
16. Kalikiliki Compound
17. Kalingalinga
18. Kalundu
19. Kamwala
20. Kanyama
21. Kasisi Area
22. Kwamwena
23. Lilayi
24. Linda Compound
25. Longacres
26. Makeni
27. Matero
28. Mass Media
29. Mazyopa
30. Meanwood Phase 2
31. Misisi Compound
32. Mtendere
33. Ngwerere
34. Northmead
35. Olympia
36. Presidential Housing Initiative Area (PHI)
37. Rhodes Park
38. Roma Township
39. Zingalume

Kitwe, Zambia (19-26 November 2020)

1. Bulangililo
2. Chachacha
3. Chamboli
4. Chibuluma
5. Chimwemwe
6. Kapoto
7. Kwacha
8. Luangwa
9. Mindolo
10. Miseshi
11. Mulenga
12. Ndeke
13. Ndeke Village and Ndeke Compound
14. Nkana East
15. Nkana West
16. Old Kwacha
17. Parklands
18. River Side
19. Town Centre
20. Twatasha
21. Wusakile
22. Zambia Compound



APPENDIX C: QUESTIONNAIRE FOR DATA COLLECTION

Research on impacts of Covid-19 on mobility of physically challenged and older people

Note: Please participate in this survey if you are above 60 years old or you have any physical challenge (mobility impaired or other disabilities). The purpose of this survey is to understand the travel behavior issues of elderly and people having mobility challenges and to know their coping strategies during Covid-19. This research is funded by UK Aid under High Volume Transport Programme.

Serial Number: _____ Date: _____

Country: Bangladesh City: _____ Location: _____

Address: _____

Gender: ☐ Male ☐ Female

Age: ☐ Below 20 ☐ 21 – 40 ☐ 41 – 60 ☐ 61 – 70 ☐ 71 – 80 ☐ 80 +

Disability: ☐ None ☐ Mentally Impaired ☐ Dumb / speech problem ☐ Blind
☐ Crutch User ☐ Wheelchair Bound ☐ Deaf / hearing problem
☐ Knee/joint Pain ☐ Learning difficulties & development disability

A. NOW (New Normal)

- A1. Frequency** ☐ Few times/year ☐ 1/week ☐ 2-3/week ☐ 4-5/week
 (avg.) of Trips: ☐ Few times/month ☐ 1/month ☐ 5+/week ☐ Several times/day
- A2. Trip made during last Week:** ☐ None ☐ 1-2/week ☐ 3-5/week ☐ 5+/week
 In NONE, Trips made during last Month: ☐ None ☐ 1-2/month ☐ 3-5/month

A3. DETAILS OF THE TRIPS IN LAST DAY:

Trip No.	Purpose	Destination	Distance	Mode	Why this mode?	Social distance & precaution	Public Transport available?	Trip time	Trip cost
1						<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
2						<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
3						<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
4						<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
5						<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		

A4. Do you travel alone or accompanied by a person? ☐ Alone ☐ Accompanied: _____

A5. Do you have any particular problem related to your travel & mobility due to Covid?
☐ No ☐ Yes: _____

B. DURING LOCKDOWN

- B1. Did you stay here during Lockdown?** ☐ Yes ☐ No
 If NO, where lived: ☐ Village home ☐ Other city ☐ Another part of this city
 Mode of Travel: ☐ Bus ☐ Train ☐ Airplane ☐ Personal Vehicle ☐ Other: _____
- B2. Did you go outside of home during lockdown?** ☐ Yes ☐ No (move to section C)
 If YES, Average frequency of Trips: _____ per Week OR _____ per Month
 Mostly for what Purpose? _____

B3. DETAILS OF THE TRIPS FOR A TYPICAL DAY DURING THE LOCKDOWN:

Trip No.	Purpose	Destination	Distance	Mode	Why this mode?	Social distance & precaution	Public Transport available?	Trip time	Trip cost
1						<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
2						<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
3						<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		

B4. Did you have any particular issue related to your travel & mobility during Lockdown?
☐ No ☐ Yes: _____

C. BEFORE COVID-19

- C1. What was your average frequency of trip or going outside of home?**
☐ Few times/year ☐ 1/week ☐ 2-3/week ☐ 4-5/week
☐ Few times/month ☐ 1/month ☐ 5+/week ☐ Several times/day

C2. DETAILS OF THE USUAL TRIPS IN A DAY (BEFORE COVID):

Trip No.	Purpose	Destination	Distance	Mode	Why used this mode?	Public Transport available?	Trip time	Trip cost
1						<input type="checkbox"/> Yes <input type="checkbox"/> No		
2						<input type="checkbox"/> Yes <input type="checkbox"/> No		
3						<input type="checkbox"/> Yes <input type="checkbox"/> No		
4						<input type="checkbox"/> Yes <input type="checkbox"/> No		
5						<input type="checkbox"/> Yes <input type="checkbox"/> No		



C3. Did you travel alone or accompanied by a person? ☐ Alone ☐ Accompanied: _____

C4. Did you feel/face any problem during your usual travel?

☐ No ☐ Yes: _____

D. PROBLEMS / SUGGESTIONS

D1. Any changes of your typical travel and mobility due to Covid-19?

☐ No ☐ Yes: _____

D2. Any change in your Travel Cost due to Covid-19?

☐ Same as it was before ☐ Increase ☐ Decrease

D3. New or additional problem/constraint for travel due to Covid-19 that was not before?

☐ No ☐ Yes: _____

If NO, any change in the Magnitude of the problems/issues in general after Covid-19?

☐ Same as it was before ☐ Increased the magnitude of the problem

D4. Any change in your occupation after Covid-19?

☐ No ☐ Yes: _____

D5. Any change in your household (or individual) income due to Covid-19?

☐ Stable ☐ Increase ☐ Decrease

D6. How hard or difficult to find and use Public Transport mode in your city?

☐ Very Hard ☐ Hard ☐ Manageable ☐ Easy ☐ Very Easy

D7. How difficult to find (navigate) or identify a Location in your city?

☐ Very Hard ☐ Hard ☐ Manageable ☐ Easy ☐ Very Easy

D8. Do you have any Expectation/Suggestion for improving your Travel & Mobility?

During Covid-19: _____

In General: _____

E. BASIC (HOUSEHOLD) INFORMATION

E1. Household Size: _____ Persons

E2. Are you dependent on the family for daily needs or has to do it yourself?

☐ Dependent ☐ Myself

E3. Any vehicle ownership in household?

☐ Yes ☐ No [move to E4]

If YES, Type of vehicle: ☐ Cycle ☐ Motorcycle ☐ Car ☐ Other: _____

Do you have access to that vehicle?

☐ Never ☐ Always ☐ Sometimes ☐ When Needed ☐ Rarely

Do you have the ability to drive that vehicle? ☐ Yes ☐ No

E4. Your Education (highest degree) obtained:

☐ illiterate ☐ Primary ☐ SSC ☐ HSC ☐ Graduate ☐ Masters

E5. What is your occupation (before Covid-19)

☐ Retired ☐ Unemployed ☐ Housewife ☐ Student

☐ Worker ☐ Employee (got/pvt) ☐ Private ☐ Business

☐ Other: _____

If RETIRED, what was your most prolonged profession: _____

Do you still work (previous or new one)? ☐ No ☐ Yes: _____

E6. Your Individual Expenditure (Tk/Month)

☐ Below 1,000 ☐ 1,001 - 5,000 ☐ 5,001 - 10,000 ☐ 10,000+

E7. Household total Income (Tk / Month):

☐ Below 10,000 ☐ 10-25,000 ☐ 25- 50,000 ☐ 50-100,000 ☐ 100,000+

F. Notes or comments (by surveyor)

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APPENDIX D: SAMPLE SIZE FROM ONLINE SURVEY

Table D2. Distribution of respondents from different city received from online survey

Country	City	Respondents	Total
Bangladesh	Dhaka	16	16
	Khulna	00	
	Other city	00	
	Village/Rural Area	00	
Pakistan	Karachi	77	88
	Lahore	5	
	Other city	3	
	Village/Rural Area	3	
Zambia	Lusaka	7	15
	Kitwe	8	
	Other city	00	
	Village/Rural Area	00	



APPENDIX E: SOCIO-ECONOMIC PROFILE OF THE RESPONDENTS

E1. BANGLADESH (Dhaka and Khulna)

Table E1-1. Age group of the respondents

Age Group	Dhaka (F)	Dhaka (%)	Khulna (F)	Khulna (%)	Total Sample (F)
Below 20 *	15	6	2	1.00	16
21-40 *	17	7	1	0.50	26
41-60 *	18	7	9	4.50	27
61-70	155	61	179	89.50	334
71-80	35	14	7	3.50	37
80+	13	5	2	1.00	15
Total	253	100	200	100	453

Note: * below 60 years are the disabled persons.

Table E1-2 shows the disability types of the respondents who have disability or physical challenges. Several respondents may have multiple disability; however, they were asked to report only the major disability type.

Table E1-2. Disability types of the respondents from Dhaka and Khulna city

Disability Types	Dhaka (F)	Dhaka (%)	Khulna (F)	Khulna (%)	Total (F)
None	201	79	161	80.50	362
Visually impaired or Blind	4	1.5	2	1.00	6
Crutch User	7	3	9	4.50	16
Deaf or hearing problem	3	1	00	00	3
Dumb or speech problem	13	5	00	00	13
Knee/ joint Pain	6	2.5	21	10.50	27
Mentally Impaired	11	4.5	00	00	11
Wheelchair Bound	8	3.5	6	3.00	14
Learning difficulties & development disability	00	00	1	0.50	1
Total	253	100	200	100	453

Table E1-3 Dependency for daily needs of the respondents

Dependency for daily needs	Dhaka (F)	Dhaka (%)	Khulna (F)	Khulna (%)
Do himself / herself	162	64	143	71.5
Dependent on family members or relatives	91	36	57	28.5
Total	253	100	200	100



Table E1-4. Household size of the respondents from Dhaka and Khulna city

Household Size	Dhaka (F)	Dhaka (%)	Khulna (F)	Khulna (%)	Total (F)
1 person	5	2	1	0.5	6
2-3 persons	51	20	27	13.5	78
4-5 persons	138	55	141	70.5	279
6-8 persons	49	19	27	13.50	76
8+ persons	10	4	4	2.00	14
Total	253	100	200	100	453

Table E1-5 Travel alone or accompanied

Travel alone or accompanied	Dhaka (F)	Dhaka (%)	Khulna (F)	Khulna (%)
Travel alone	152	59	168	84
Accompanied by family member	79	32	30	15
Accompanied by neighbour or friend	22	9	2	1
Total	253	100	200	100

Figure E1-1 and Table E1-6 respectively show the education attainment of the respondents and their occupation before COVID-19. About 18.5% and 26% respondents in Dhaka and Khulna respectively are now retired. Those who are retired, their most prolonged profession were employee of government or private sector (69% and 96% respectively), business (7% and 2% respectively), and worker (23% and 2% respectively). Of the retired, only 23% in Dhaka and 7% in Khulna are now working while the remaining are not engaged in any job.

Figure E1-1. Education attainment of the respondents in Dhaka and Khulna city

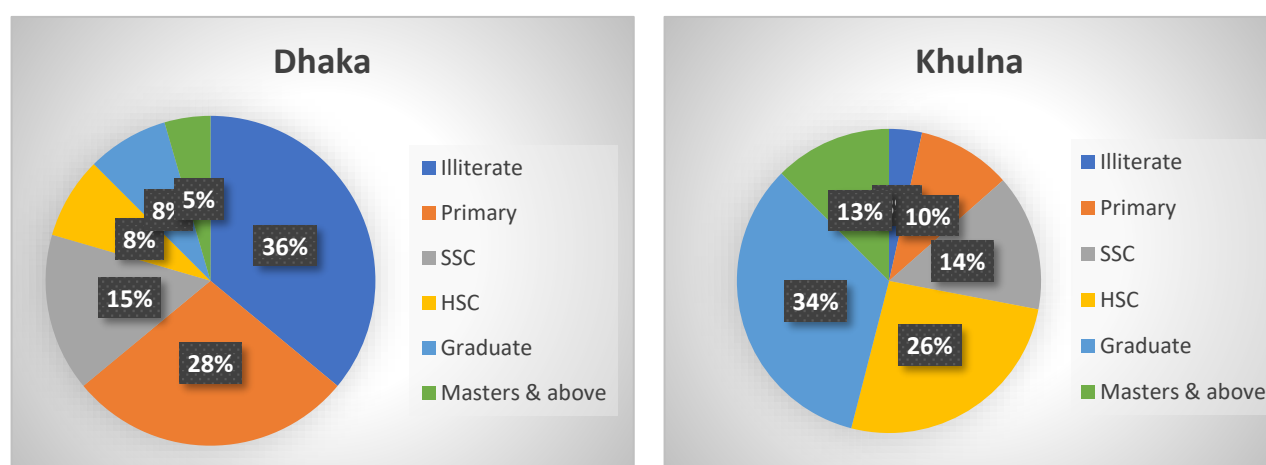


Table E1-6. Occupation of the respondents

Occupation	Dhaka (F)	Dhaka (%)	Khulna (F)	Khulna (%)	Total (F)
Unemployed	21	9	5	2.5	26
Housewife	58	25.5	20	10	78
Business or enterprise	40	17.5	57	28.5	97
Employee (govt./ private)	12	5	42	21	54



Occupation	Dhaka (F)	Dhaka (%)	Khulna (F)	Khulna (%)	Total (F)
Worker	26	11.5	18	9	44
Student	3	1.5	2	1	5
Retired	42	18.5	52	26	94
Other	26	11.5	4	2	30
Total	228	100	200	100	428

Figure E1-2 shows the respondents' access to the household vehicle. Access to the household vehicle might be influenced by the ability of driving; as 68% in Dhaka and 42.5% in Khulna do not know how to drive the vehicle owned by household.

Figure E1-2. Access to the household vehicle of the respondents in Dhaka and Khulna city

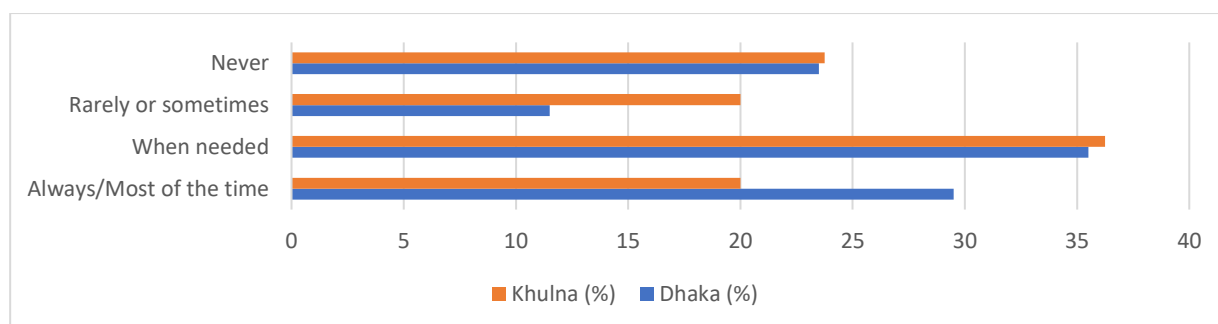


Table E1-7. Stayed in this house or location during lockdown

Where stayed during lockdown	Dhaka (F)	Dhaka (%)	Khulna (F)	Khulna (%)
This place/ house	235	93	191	95.5
Other place (village/ other city)	18	7	9	4.5
Total	253	100	200	100

Table E1-8. Respondents' usual trips on a typical day before COVID-19

Total Trips per Day	Dhaka (F)	Dhaka (%)	Khulna (F)	Khulna (%)
None	3	1.5	0	0
2	167	75.5	190	95
4	35	16	10	5
6	16	7	0	0
Total	221	100	200	100

Table E1-9. Respondents' change in typical travel behaviour and mobility due to COVID-19

Change in Travel Behaviour or Mobility	Dhaka (F)	Dhaka (%)	Khulna (F)	Khulna (%)
Yes (changed)	46	18	60	30
No Change (Same as it was Before)	207	82	140	70



Table E1-10. Respondents' change in trip cost due to COVID-19

Change in Trip Cost	Dhaka (F)	Dhaka (%)	Khulna (F)	Khulna (%)
Same as it was before	205	81.5	56	28.00
Increased	32	13	143	71.50
Decreased	14	5.5	1	0.50
Total	251	100	200	100

Table E1-11. Respondents' change in occupation after COVID-19

Change in occupation	Dhaka (F)	Dhaka (%)	Khulna (F)	Khulna (%)
No Change	233	93	192	96.5
Yes, Changed	18	7	7	3.5
Total	251	100	199	100

Table E1-12. Respondents new or additional travel problem/ constraint due to COVID-19 that was not before

Additional problem for travel	Dhaka (F)	Dhaka (%)	Khulna (F)	Khulna (%)
Yes, additional problems*	8	3	35	17.5
No**	244	97	165	82.50
Total	252	100	200	100

* Those who mentioned additional travel problem; the problems are:

- Uncomfortable of wearing the face mask, breathing problem because of mask;
- Cannot travel in public bus, need to maintain physical distancing;
- Scared of going outside of home;
- Transport cost increased e.g. high rickshaw fare;
- vehicle is not available or fewer vehicle available.

** Those who mentioned NO additional travel problems; the magnitude of the problem (they usually faced before COVID-19) are now:

Problems in same magnitude	Dhaka (F)	Dhaka (%)	Khulna (F)	Khulna (%)
Increased the magnitude of the problem	12	5.5	98	57
Same as it was before	213	94.5	74	43
Total	225	100	172	100

From the online survey, all the respondents are elderly people (no response from disabled people) who belong to middle- or higher-income groups (household monthly income Tk 50,000 and above) and 60% have household vehicle with access always or when needed. Almost 56% are male. Due to COVID-19, 56% do not feel any additional problem for travel and 83% have no change in travel cost, though 75% mentioned they travel less. During lockdown, 69% had no travel problem. Before COVID-19, 69% did not feel any travel problem as used car (56%) or taxi (6%) or walk (38%), 75% had no cost or applicable, 19% Tk 202-500 and 6% Tk 101-200.



E2. PAKISTAN (Karachi and Lahore)

Table E2-1 briefly delineates the socio-economic profile of the respondents. Figure E2-1 shows the gender distribution of the respondents with physical challenges or disability; the majority are males whilst women make up only 31% and 26% in Karachi and Lahore, respectively.

Table E2-1. Demographics of the respondents from Karachi and Lahore city

Categories	Karachi (N=209)		Lahore (N=237)	
	Number of Respondents	%	Number of Respondents	%
Sample Collected				
Disabled	30	14%	2	0.8%
Physically fit Older	114	55%	156	66%
Older with Disability	65	31%	79	33%
Age Group				
Below 20	17	8%	0	0%
21-40	13	6%	2	1%
41-60	21	10%	68	29%
61-70	123	59%	135	57%
71-80	25	12%	25	11%
Above 80	10	5%	7	3%
Gender				
Male	144	69%	175	74%
Female	65	31%	62	26%

Figure E2-1. Gender distribution with physical challenges of the respondents from Karachi and Lahore city

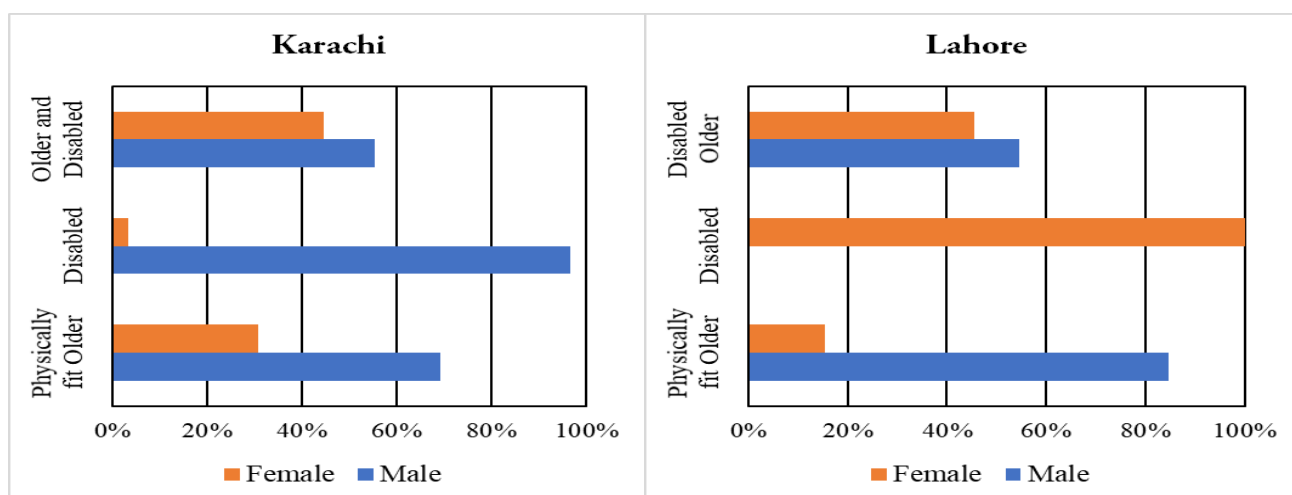


Figure E2-1 shows that the data also covers some other types of disabilities: wheelchair-bound; mentally impaired; blind or vision impaired; deaf or with hearing problems; dumb or with speech problems; and crutch users. The percentages for these groups are 10%, 24%, 8%, 2%, 8%, and 10% respectively for Karachi and 20%, 1%, 5%, 4%, 0% and 10% respectively for Lahore.



Figure E2-2. Disability types of the respondents from Karachi and Lahore city

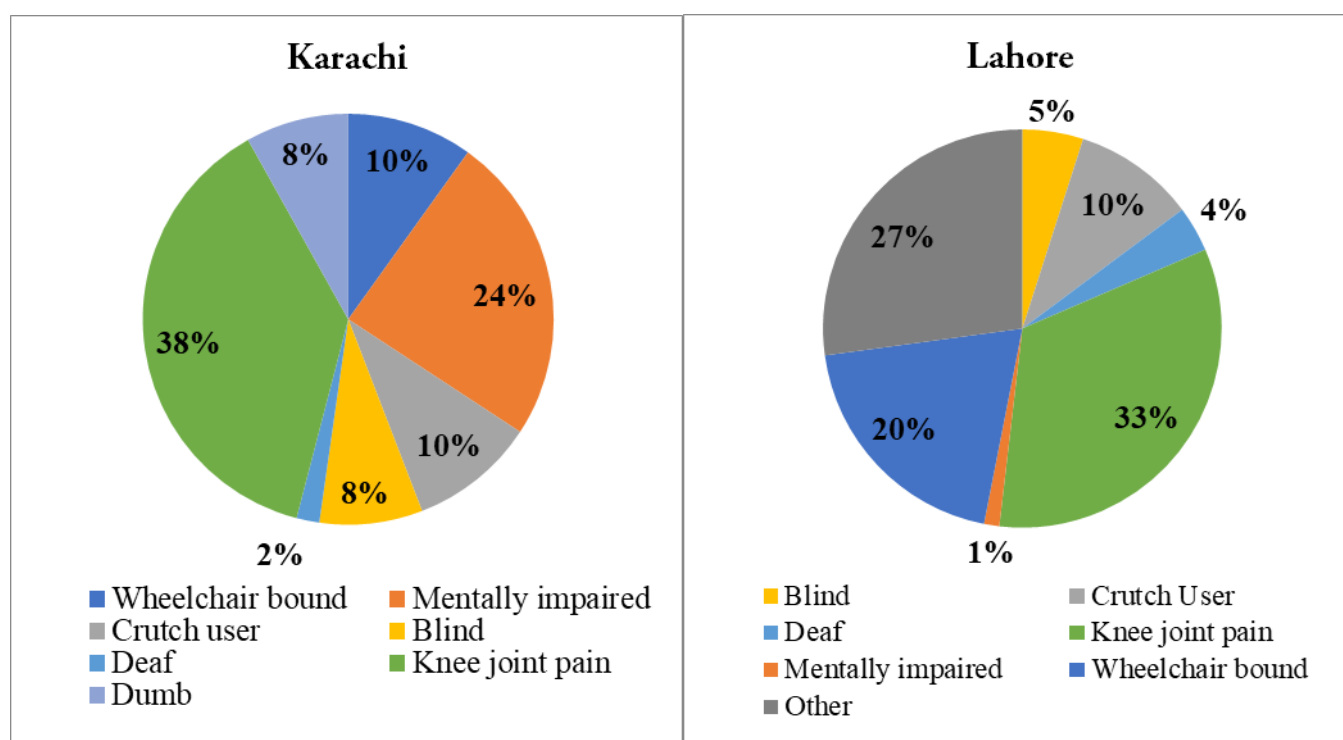


Table E2-2 provides the family size distribution of the respondents for both cities. Only a few respondents, 2.5% and 2% in Karachi and Lahore respectively, live in care homes for the elderly.

Table E2-2. Household size of the respondents in Karachi and Lahore

Categories	Karachi		Lahore	
	Number of Respondents	%	Number of Respondents	%
Household Size				
1	1	0.5%	0	0%
2 – 3	30	14.5%	6	3%
4 – 5	88	42%	40	18%
6 – 8	61	29%	109	50%
8+*	29	14%	65	30%
Total	209	100	220	100

Note: * Several of them live in care homes.

Figure E2-3 shows the education attainment of the respondents; in Karachi 38% are graduates and 20% received primary education while in Lahore it is 33% and 27% respectively.



Figure E2-3: Education level the respondents in Karachi and Lahore city

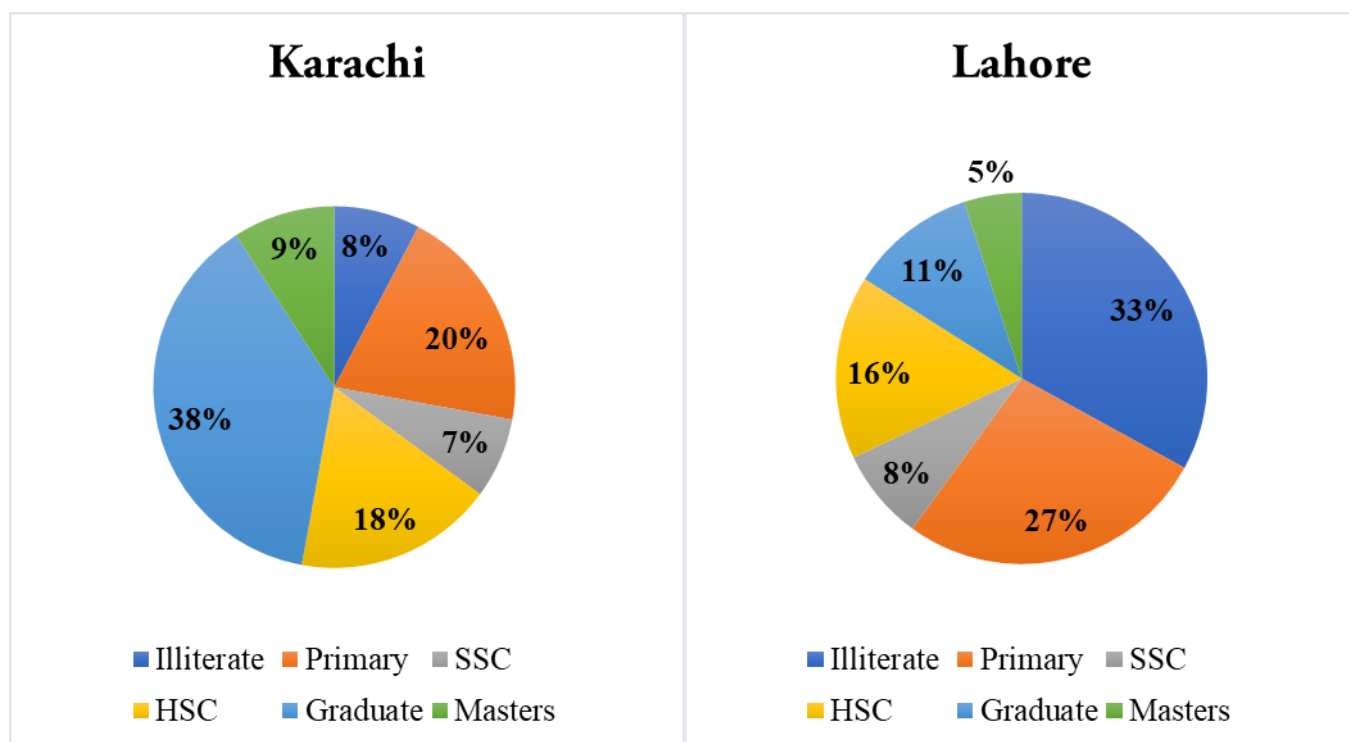
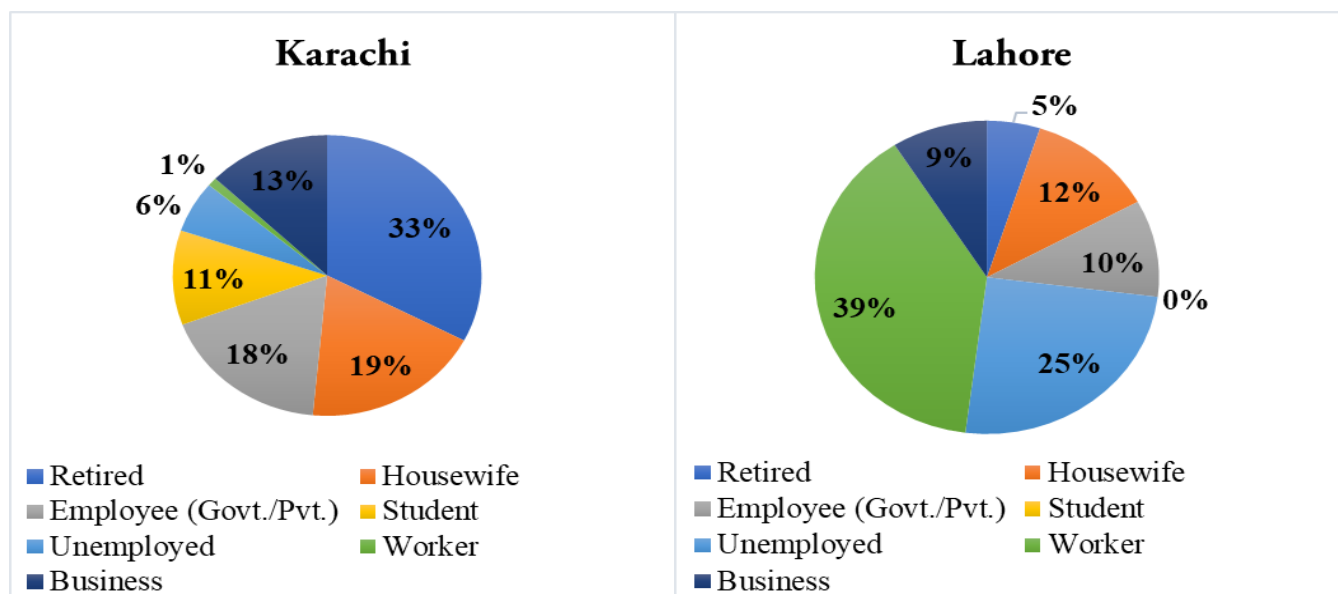


Figure E2-4. Occupation of the respondents in Karachi and Lahore city



The retired people had previously been involved in a variety of professions including teaching, engineering, management, business, and journalism. Only 4 respondents are working after retirement.



Figure E2-5. Personal monthly expenditure (PKR/ month) of the respondents in Karachi and Lahore city

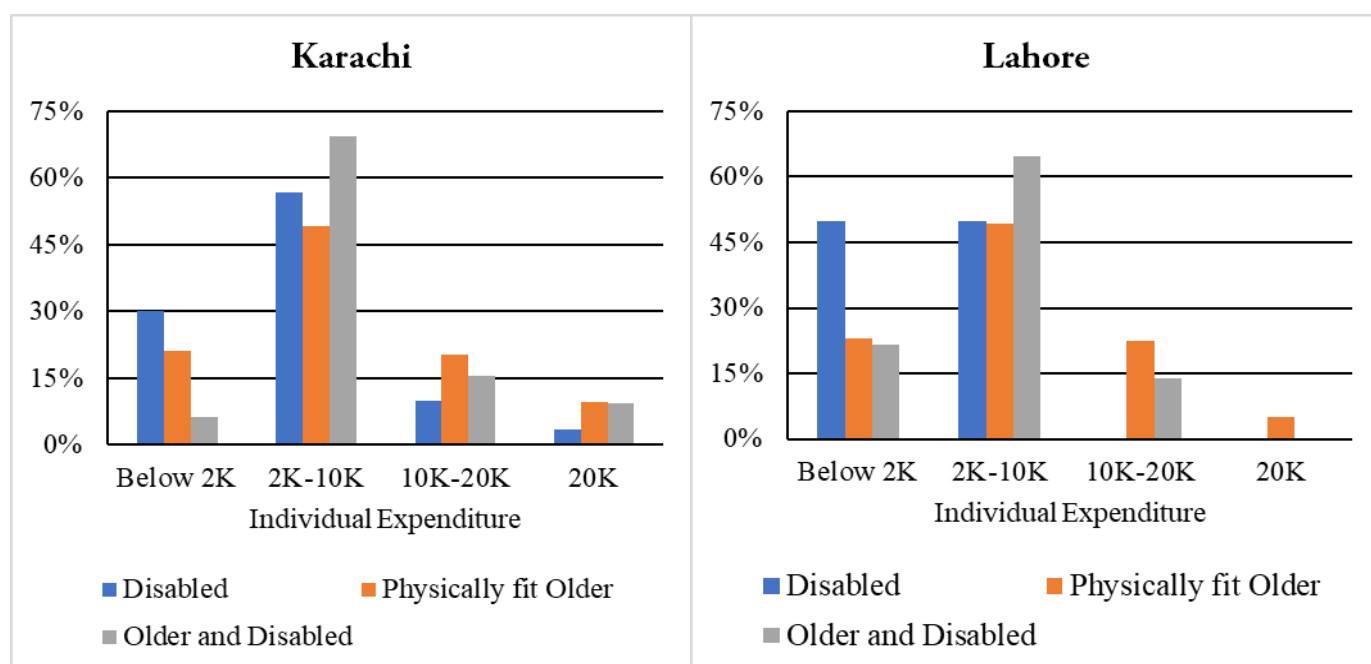


Table E2-3. Respondents' access to the household vehicle in Karachi city

Access to Household Vehicle	Karachi (F)	Karachi (%)
Always/ Most of the time	79	46
When needed	45	26
Rarely or sometimes	29	17
Never	19	11
Total	172	100

Table E2-4. Respondents' usual trips on a typical day before COVID-19

Total Trips per Day	Karachi (F)	Karachi (%)	Lahore (F)	Lahore (%)
2 trips	104	50	110	50
3 or more trips	104	50	110	50
Total	208	100	220	100

E3. TANZANIA (Dar-es-Salaam and Zanzibar)

Table E3-1. Demographics of the respondents from Dar-es-Salaam and Zanzibar city

Categories	Dar-es-Salaam City (N=203)		Zanzibar Unguja (N=155)	
	Number of Respondents	%	Number of Respondents	%
Category of the Respondents or Sample				
Disabled	36	18%	6	3%
Physically fit Older	152	76%	123	80%
Older with Disability	15	6%	26	17%
Age Group				
Below 20	2	1	00	00



Categories	Dar-es-Salaam City (N=203)		Zanzibar Unguja (N=155)	
	Number of Respondents	%	Number of Respondents	%
21-40	20	10	1	0.65
41-60	13	6	5	3.35
61-70	107	53	112	72.25
71-80	58	28.5	29	18.75
Above 80	3	1.5	8	5
Gender				
Male	127	63%	88	57%
Female	76	37%	67	43%

The respondents below 60 years are the disabled people.

Figure E3-1. Gender distribution with physical challenges of the respondents from Dar-es-Salaam and Zanzibar city

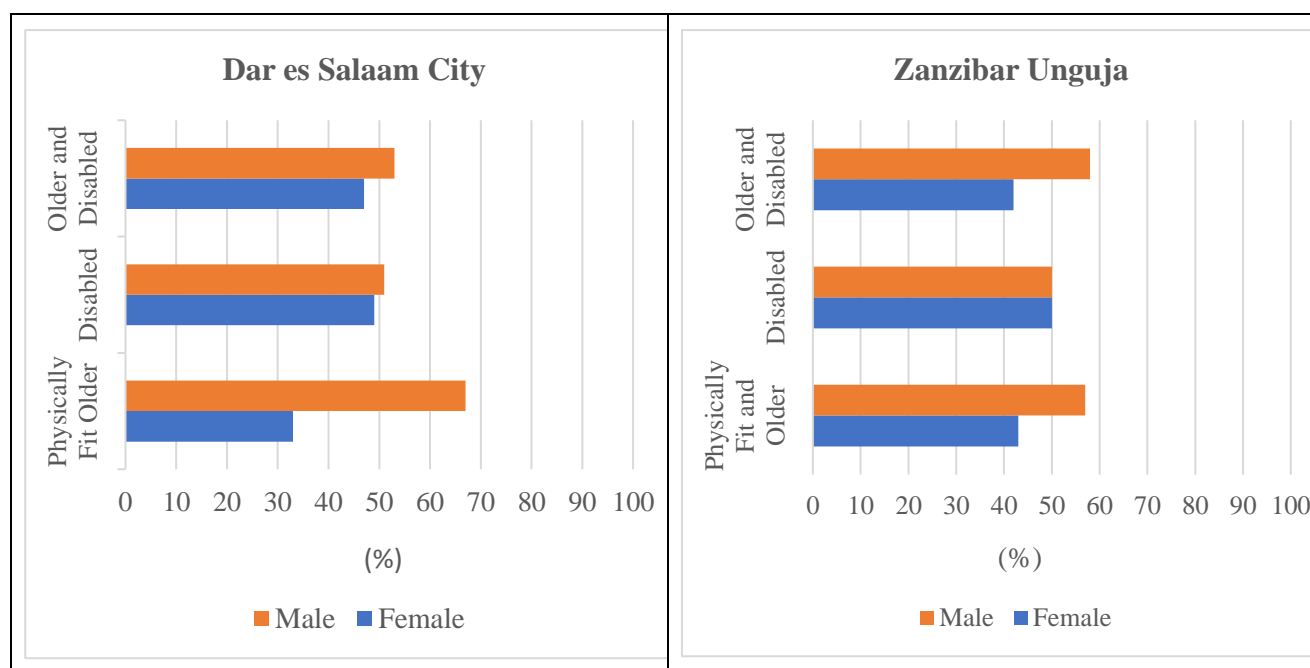


Figure E3-2 shows different types of disability of the respondents. A large portion of data is obtained from elderly people and for them knee/ joint pain is the most common weakness. The data also covers some other types of disabilities that are wheelchair-bound, mentally impaired, blind or vision impaired, deaf or hearing problem, dumb or speech problem, and crutch users, with percentages of 22%, 2%, 4%, 1%, and 9% respectively for Dar-es-Salaam and 12%, 9%, 5%, 5%, 1% and 6% respectively for Zanzibar.



Figure E3-2. Disability types of the respondents from Dar-es-Salaam and Zanzibar city

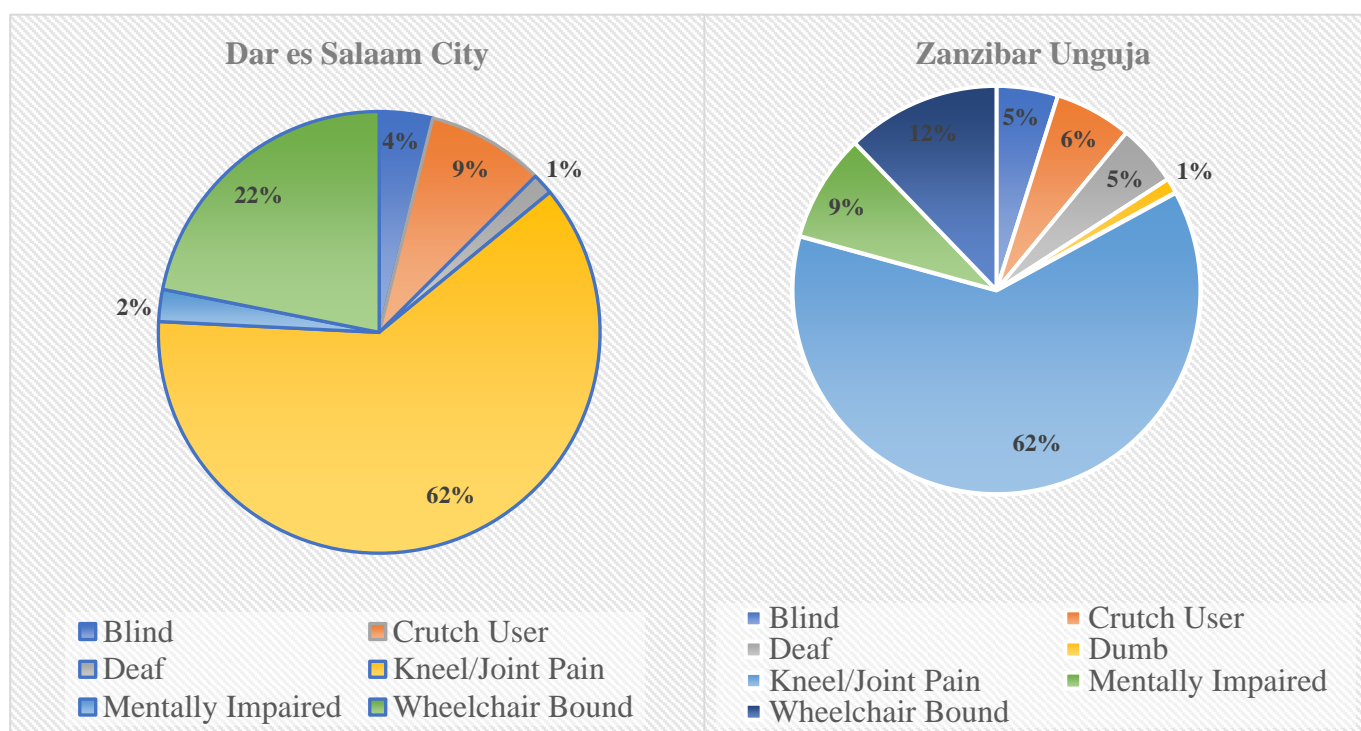


Table E3-2. Household size of the respondents in Dar-es-Salaam and Zanzibar

Household Size (person)	Dar-es-Salaam City		Zanzibar City	
	Frequency	%	Frequency	%
1	0	0	0	0
2-3	39	23	11	7.5
4-5	58	34.5	25	17.5
6-8	62	37	50	35
8+	9	5.5	57	39
Total	168	100	143	100

Table E3-3. Dependency for daily needs of the respondents

Dependency for daily needs	Dar-es-Salaam (F)	Dar-es-Salaam (%)	Zanzibar (F)	Zanzibar (%)
Do himself / herself	134	66	85	55
Dependent on family member/ relatives	68	34	70	45
Total	202	100	155	100

Table E3-4. Travel alone or accompanied

Travel alone or accompanied	Dar-es-Salaam (F)	Dar-es-Salaam (%)	Zanzibar (F)	Zanzibar (%)
Travel alone	162	83	122	79
Accompanied by family member	24	12	31	20
Accompanied by neighbour/ friend	10	5	2	1
Total	196	100	155	100



Table E3-5. Respondents' access to the household vehicle

Access to vehicle	Dar-es-Salaam (F)	Dar-es-Salaam (%)	Zanzibar (F)	Zanzibar (%)
Always/ Most of the time	15	52	18	40
When needed	10	34	19	42
Rarely or sometimes	4	14	7	16
Never	00	00	1	2
Total	29	100	45	100

Table E3-6. Stayed in this house or location during lockdown

Stayed in house or this place	Dar-es-Salaam (F)	Dar-es-Salaam (%)	Zanzibar (F)	Zanzibar (%)
Yes	199	98.5	142	91.5
No (at village/ other city)	3	1.5	13	7.5
Total	202	100	155	100
If lived at village or other city, what travel mode used to come in this place				
Bus	3	100	12	92
Personal vehicle	0	0	1	8

Figure E3-3 shows the educational attainment of respondents; many have primary education in both cities, i.e. 50% for Dar-es-Salaam and 44% for Zanzibar. Illiteracy is also pronounced (33% and 30% respectively) while about 1% have a Masters' degree in both Dar-es-Salaam and Zanzibar.

Figure E3-3. Education level of respondents Dar es Salaam City (Left) and Zanzibar Unguja (Right)

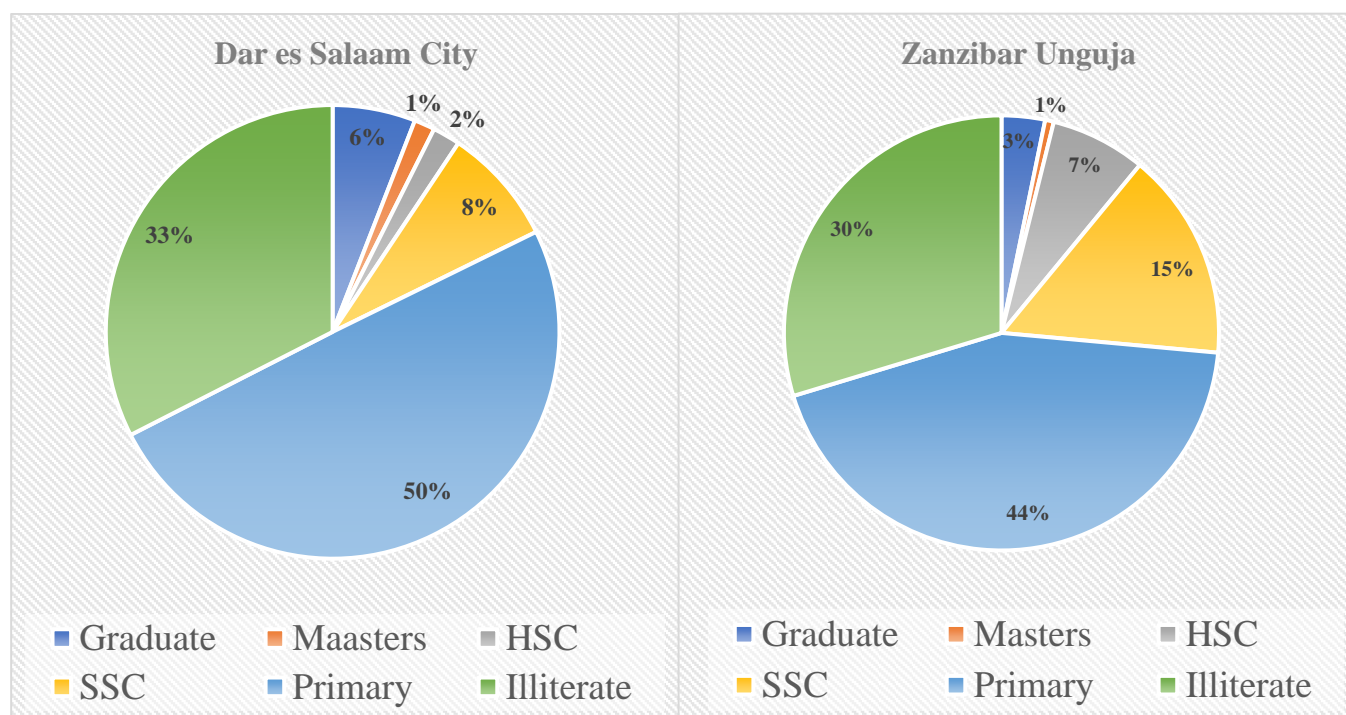
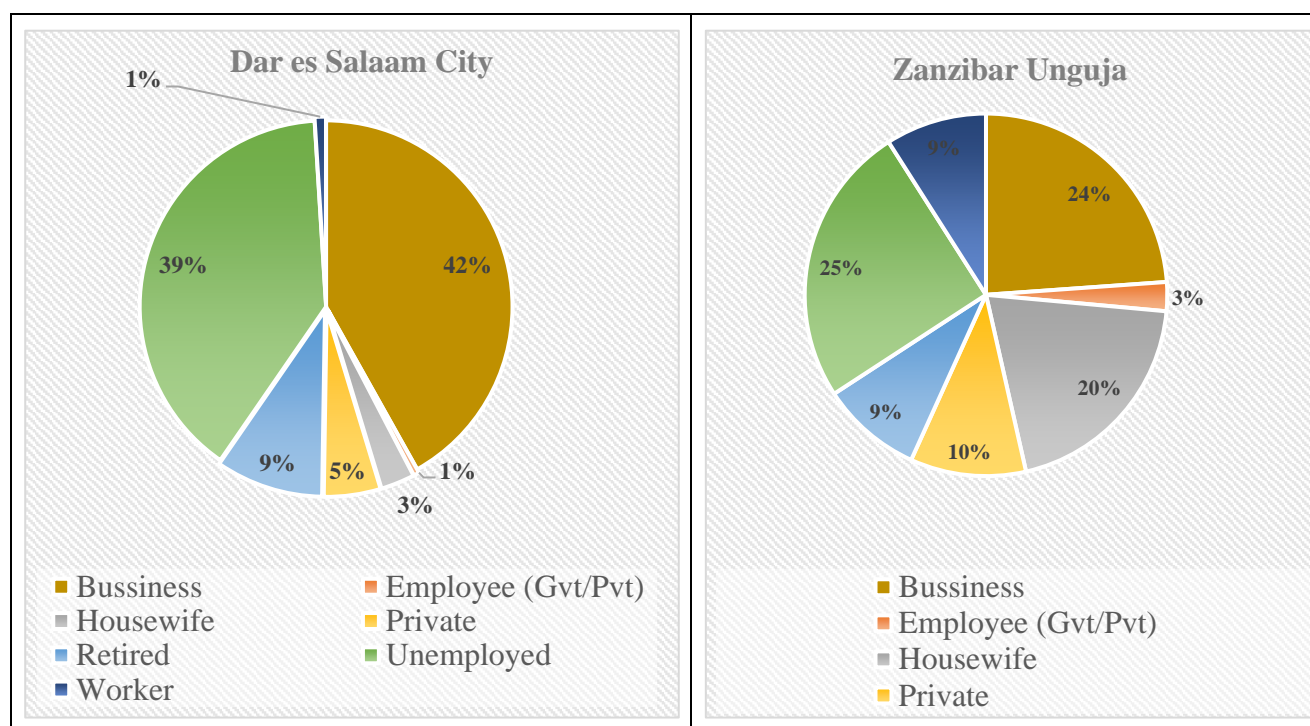


Figure E3-4 illustrates the distribution of the respondents' occupations before COVID-19. The data obtained from Dar-es-Salaam shows that the dominating categories are petty trading or business-owning (42%) and unemployed (39%) while some (9%) are retired. For Zanzibar, a high proportion of respondents are business-owning (24%), unemployed (25%) and unemployed homemakers (20%). The difference is cultural as most female respondents in Zanzibar who are unemployed declare to be housewives while for Dar-es-salaam they are engaged in small business (petty trading).



Figure E3-4. Occupation of the respondents in Dar-es-Salaam and Zanzibar



E4. ZAMBIA (Lusaka and Kitwe)

A significant portion of the respondents in Lusaka belong are in the age group 41-60 years, who are physically challenged. Table E4-1 shows the different types of disability of the respondents; a very high proportion of the disability covered is a knee/ joint pain and wheelchair-bound or crutch user.

Table E4-1. Age group of the respondents from Lusaka and Kitwe city

Age Group	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
Below 20 *	9	4.5	9	4
21-40 *	11	5.5	32	15
41-60 *	42	21	93	44.5
61-70	76	38	47	22.5
71-80	39	19.5	15	7
80+	23	11.5	14	7
Total	200	100	210	100

Note: * below 60 years are the disabled persons.

Table E4-2. Disability types of the respondents from Lusaka and Kitwe city

Disability Types	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
None	59	29	138	65
Blind	13	6.5	6	3
Crutch User	16	8	11	5
Deaf or hearing problem	12	6	7	3.5
Dumb or speech problem	12	6	6	3
Knee/ joint Pain	70	35	18	8.5
Mentally Impaired	1	0.5	6	3



Disability Types	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
Wheelchair Bound	17	8.5	15	7
Learning difficulties & development disability	1	0.5	4	2
Total	201	100	211	100

Table E4-3. Household size of the respondents in Lusaka and Kitwe city

Household Size	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
1	8	4	3	1.5
2-3	34	17	19	9
4-5	56	28	79	37.5
6-8	69	34	99	47
8+	33 *	16	11	5
Total	201	100	211	100

* 3 respondents live in care homes for elderly.

Table E4-4. Dependency for daily needs of the respondents

Dependency for daily needs	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
Do himself / herself	127	63	131	62
Dependent on family member/ relatives	74	37	80	38
Total	201	100	211	100

Table E4-5. Travel alone or accompanied

Travel alone or accompanied	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
Travel alone	131	65	135	64
Accompanied by another person	70	35	76	36
Total	201	100	211	100

Table E4-6. Stayed in this house or location during lockdown

Where stayed during lockdown	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
This place/ house	163	81	179	85
Other place (village/ other city)	38	19	32	15
Total	201	100	211	100

Table E4-7. Respondents' access to the household vehicle

Access to vehicle	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
Always/ Most of the time	18	33	59	71
When needed	14	25	11	13
Rarely or sometimes	17	31	13	16
Never	6	11	00	00
Total	55	100	83	100



Table E4-8. Education attainment of the respondents from Lusaka and Kitwe city

Education	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
Illiterate	48	24	9	4
Primary-grade 7	44	22	10	5
Junior Secondary- Grade 9	37	18	21	10.5
Senior Secondary- Grade 12	27	13.5	55	26
Graduate	38	19	100	47
Masters & above	7	3.5	16	7.5
Total	201	100	211	100

Table E4-9. Occupation of the respondents before COVID-19 in Lusaka and Kitwe city

Occupation	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
Unemployed	49	25	31	14
Housewife	10	5	17	8
Business or entrepreneur	54	27	41	19.5
Employee	20	10	71	33
Worker	17	8.5	12	5.5
Student	9	4.5	7	3
Retired	42	21	32	15
Total	201	100	211	100

Of the retired, only 25% in Lusaka and 56% in Kitwe are now working while the remaining are not doing any work.

Table E4-10. Most prolonged occupation of the retired respondents from Lusaka and Kitwe city

Occupation	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
Business	4	9.5	00	00
Employee (govt./ private)	22	52.5	13	40.5
Worker	12	28.5	19	59.5
Other	4	9.5	00	00
Total	42	100	32	100

Table E4-11. Individual expenditure of the respondents from Lusaka and Kitwe

Individual Expenditure (ZMW/ month)	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
Below 250	114	57	47	22.5
251- 1,000	28	14	75	35.5
1,001- 2,500	23	11.5	19	9
2,501- 5,000	17	8.5	52	24.5
5,000 +	19	9	18	8.5
Total	201	100	211	100



Table E4-12. Respondents' usual trips on a typical day before COVID-19

Total Trips	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
None	43	20	34	16
1-2	121	57	149	70.5
3-4	44	20.5	24	11.5
5 +	5	2.5	3	1.5
Total	213	100	211	100

Table E4-13. Respondents' change in typical travel behaviour and mobility due to COVID-19

Change in Travel Behaviour or Mobility	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
Yes (changed)	77	38	134	63.5
No Change (Same as it was Before)	124	62	77	36.5

Table E4-14. Respondents' change in trip cost due to COVID-19

Change in Trip Cost	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
Decrease / Increase	116	58	140	66
Same as it was before	85	42	71	34
Total	201	100	211	100

Table E4-15. Respondents' change in occupation after COVID-19

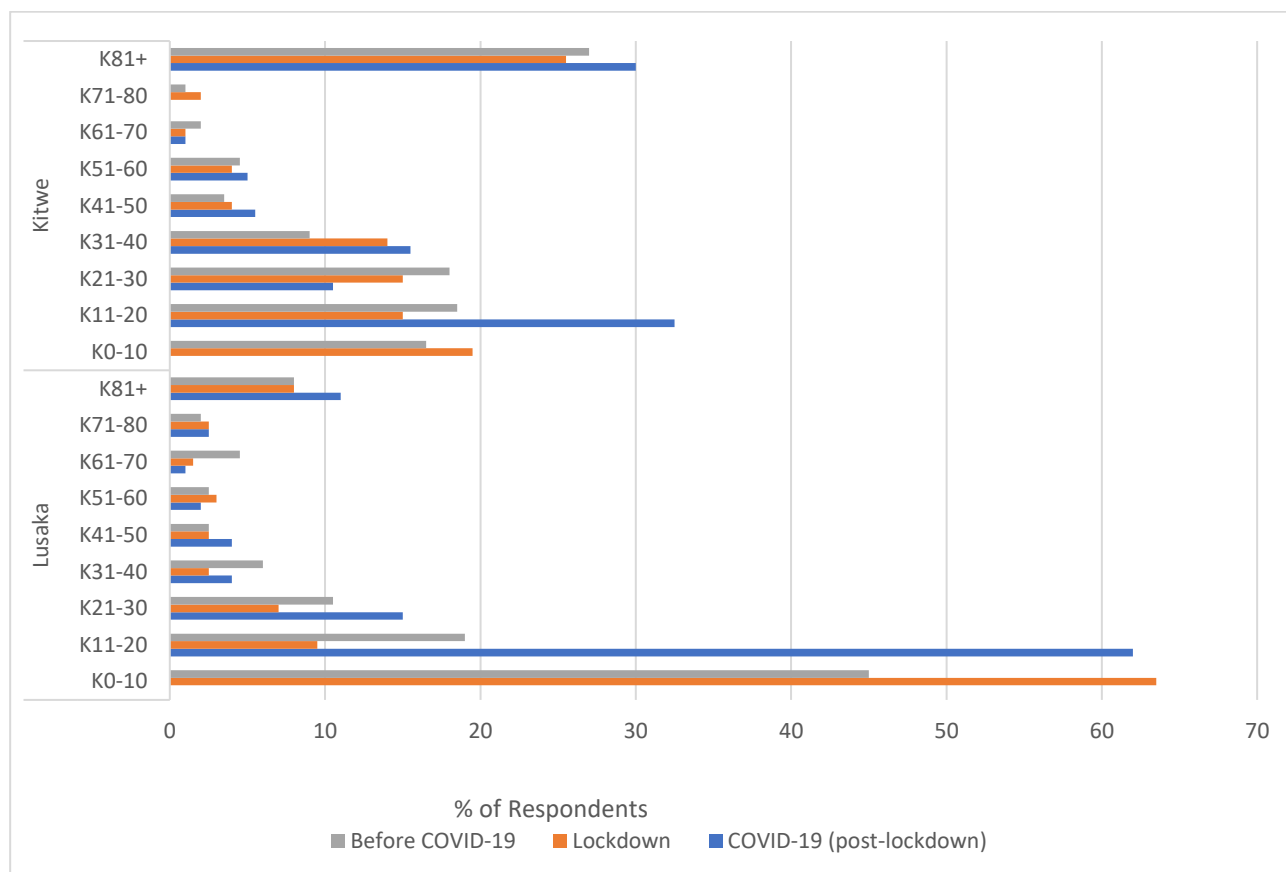
Change in occupation	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
No Change	170	84	199	94
Yes, Changed	31	16	12	6
Total	201	100	211	100

Table E4-16. Changes in household income due to COVID-19

Change in income	Lusaka (F)	Lusaka (%)	Kitwe (F)	Kitwe (%)
Decrease	138	69	88	41.5
Increase	4	2	12	5.6
Stable	59	29	111	53
Total	201	100	211	100



Figure E4-1. Respondents' trip cost in Lusaka and Kitwe city during COVID-19 and before COVID-19



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