ECONOMIC VULNERABILITIES AND PANDEMIC MOBILITIES

MOBILITY OF LOW-INCOME POPULATIONS IN İSTANBUL

Abstract

This paper explores the everyday mobilities of low-income populations during the Covid-19 pandemic through a mixed-methods study in İstanbul. It shows how economic burdens brought by the Covid-19 pandemic affected individuals' attitudes towards using different transport modes, mobility levels, and concerns over public transport use based on socioeconomic and demographic differences. It suggests that household structures, social networks and perceived mobility restrictions may affect mobility levels. Overall, the paper argues that changes and continuities in mobility trends and practices due to the pandemic should be considered with broader social and economic dynamics at the household and community level. It draws key lessons learned concerning the pandemic mobilities to be transferred to future transport policy and mobility governance so that intragenerational inequalities could be mainstreamed in these policy domains.

Keywords: mobility governance; Covid-19; pandemic mobilities; İstanbul; urban inequality

Introduction

The Covid-19 pandemic is the most significant disruption to mobilities in modern times (Poom et al., 2020). This paper investigates the mobility trends and practices of the low-income population in İstanbul during the pandemic. To do this, it uses a mixed-methods approach, combining online surveys during the different phases of the pandemic and one-to-one interviews to uncover the experiences related to the economic burden of the pandemic on the low-income population. The paper also explores how daily mobility becomes an area of struggle where sometimes new tactics are developed to overcome difficulties.

The study asks the following questions: what were the mobility patterns, practices and perceptions of the low-income populations in İstanbul during the pandemic? How did (the lack of) mobility pose economic and social challenges over time? Were mobility and transport used to address the challenges, and how?

The rationale behind this empirical focus rests on three key themes from the existing literature:

- The role of income in the decline of mobility levels and the low-income communities' mobility trends and practices during the pandemic.
- The distributional impacts of im/mobility among social groups.
- The role of contextual factors in the mobility-related implications of the Covid-19 pandemic.

The following section will unpack these themes and briefly introduce the empirical context. The methodology will be followed by presenting the findings of the initial and weekly surveys and the one-to-one interviews. The final section will discuss these findings concerning the existing literature and policy context.

The rationale and context

The decline in mobility during the Covid-19 pandemic varied by country, region or community level (Borkowski et al., 2021; Nouvellet et al., 2021; Saha et al., 2021). Mainly using mobile data, initial studies provided insights into the importance of income in the determining role of restrictions in the mobility of people across different countries (Coven & Gupta, 2020; Dasgupta et al., 2020; Lee et al., 2021; Mogaji, 2020; Valdano et al., 2021). Lee et al. (2021) show that the Covid-19 pandemic disproportionately affected poor and low-income groups as they did not have the opportunity to be immobile due to job insecurity and lack of telecommuting options. A study conducted in Hong Kong reveals that individuals with lower income had a slower mobility decline during the pandemic's initial stages (Huang et al., 2022). The higher levels of mobility in poorer communities have been associated with increased risks of infection and adverse health conditions (Sheng et al., 2022) and are explained by several factors, including those in poorer communities working as essential workers (e.g., Kearney & Munana, 2020), not being able to telecommute due to nature of their jobs or lack of internet access (e.g., Chiou & Tucker, 2020), or being unable to comply (Sheng et al. 2022). The mobile data used to explore the mobility patterns did not necessarily capture the everyday practices of those on low incomes, which may be more problematic for those cities where the public primarily relies on informal transport (Mogaji, 2020).

Recent studies have provided more mixed messages concerning the mobility trends and practices of those on low incomes. For instance, the results were unclear for slum residents in Mumbai (Sheng et al., 2022); there was no statistically significant evidence that the lockdowns had a differential impact on slum residents' mobility. Recent studies also propose different formulations of inequality in addition to looking at mobility trends by income to understand other travel behaviours across time and social groups and wider access. These include the role of the distribution of services in predicting group travel behaviours (Zhou & Zhou, 2023), inequity in access to community parks (Li et al., 2023) and social diversity during the day across population groups/places (Müürisepp et al., 2023). Non-income factors also affect inequalities in mobility and access. For instance, the impacts have been more pronounced for women (Porter et al., 2021). Disruptions to and changes in the labour market materialised in disruptions to commuting, changes to working hours and conditions, and business closures with differential implications for different social groups, but especially for women mainly due to their multiple roles (Assoumou Ella, 2021; Bick et al., 2022; Harrington & Hadjiconstantinou, 2022; Thomas et al., 2021).

Contextual, place-specific factors have also played a role in such differential mobility-related impacts of the Covid-19 pandemic. At the country level, more affluent countries have seen their residents more willing to self-isolate and work from home, even without strict social distancing measures. In contrast, less developed countries have struggled with compliance, especially during the second wave of the pandemic (Czech et al., 2021). Similar comparisons of mobility levels have demonstrated that underdeveloped countries were more affected by the Covid-19 pandemic (Wang et al., 2021). At a city level, the nature of urban governance was central in determining the impacts of mobility patterns in the transport systems and their associated sectors, and vice versa. For example, public transport use in Metro Manila declined immediately, as it did everywhere else, and people there started using public transport again more gradually (Hasselwander et al., 2021). In İstanbul, the situation was different. The increase in the use of public transport after the first set of travel restrictions was much faster (İstanbul Metropolitan Municipality (IMM), 2020). Existing vulnerabilities in transport planning also affect the diversity of this decline. The funding of Transport for London, the central institution responsible for the transport system in Greater London, primarily comes from user fares. Still, it has continued its

services despite the rapid revenue decline thanks to the central government's financial support (Transport for London, 2020). Conversely, informal transport operators have experienced significant economic difficulties in Lagos due to their expenses for vehicles and services and the decrease in supply (Mogaji, 2020).

In addition to these three empirical themes, we draw on the broader definition of mobility, entailing the exploration of different forms and scales of mobility (Urry, 2007). Doing so will enable investigating moving within and across cities and mobilities across lifetimes with implications for various social groups, from children to female-headed households. The existing research has considered different forms of mobilities under the broad umbrella of pandemic mobilities. In this paper, we frame travel patterns, leaving the house, transport preferences, residential mobilities, social mobility and mobility practices as part of the pandemic mobilities. A growing body of commentaries and studies explain and use the phrase 'pandemic mobilities'. Freudendal-Pedersen and Kesselring (2021) define the empirical motivation behind these explorations: how will urban mobilities come out of fear of pandemic confinement? Conceptually, im/mobility during the pandemic is almost a mobility of modern times, complex, multi-layered and multi-scale, and entails various meanings and connotations. Adey et al. (2021) argue that pandemic mobilities are problematic systemic disruptions that the new mobilities paradigm can address.

"Pandemic mobilities" has appeared in multiple empirical contexts, indicating different temporalities and forms of mobilities. In the context of Sydney, McDuie-Ra (2023) refers to skateboarding as alternative mobility. Alexandri and Janoschka (2020) link pandemic mobilities with leisure-oriented mobilities to emphasise the role of transnational gentrifications. Indeed, several other studies have looked at pandemic mobilities in discussing the impact of the pandemic on tourism and tourism mobilities (Viana-Lora et al., 2021). Finally, Farbotko (2023) took a different form of mobility with pandemic mobilities, looking at Tuvalu's pandemic experience of new international immobilities and rural mobilities. This clarified the role of family and cultural ties that eases coping strategies in the pandemic through mobilities. All in all, using the term pandemic mobilities as an all-encapsulating term will help us provide broader conceptual discussions about how mobility, commuting and the everyday life challenges of low-income communities during the pandemic will refine the long-term mobility and economic difficulties of low-income residents (Plyushteva, 2022).

Research context

As a global city, the case of İstanbul represents the empirical and conceptual complexity that the pandemic has imposed on everyday life, economic vulnerabilities and dense populations. The local governance and funding structures significantly influenced pandemic mobilities in İstanbul. İstanbul is the largest metropolitan area in its proximate geography by size and population in Turkey, and different forms of mobility-related inequalities characterise it. According to the latest household transport survey (HTS) data collected by the İstanbul Metropolitan Municipality (IMM) in 2012 (IMM, 2012), age, education, car ownership, gender, household size, employment and income (as in the car and home ownership) were the main socioeconomic determinants of daily mobility patterns of individuals. Most importantly, unemployed individuals, especially unemployed women, constituted the most significant percentage of the inactive population. Homeowners are likely to make more daily trips than tenants. Having a car in the household increases journey times by just over a minute per day. Education is expected to determine the geographical size of the activity area. Although individuals with low levels of education (primary school and below) make more trips, their journeys are shorter than those with higher education levels. Additionally, highly educated groups drive more, while individuals with low education levels walk and use public transport more.

The Turkish Statistical Institute's (TURKSTAT) analysis reveals that the gap between the transport expenditures of the poorest and the wealthiest quintiles increases as the former tends to spend less yearly (TURKSTAT, 2008-2019) (TURKSTAT 2019). The Sustainable Mobility Plan of the IMM aims to reduce this figure to %5 (Arup, 2022). Although the IMM HTS 2012 is the last of its kind in İstanbul (by sample size and detail), its analysis can only guide us to a certain extent, as the city has witnessed tremendous changes in the last decade, including the construction of mega infrastructure projects such as the Eurasian tunnel, a new airport and a new road bridge. As a result of infrastructure development in the North and incentives through new development rights, a burst in residential development has heightened urban sprawl, and the city has almost reached its natural limits. In addition to the usual trends triggering the population increase, high migration from the Middle East and regional tourism have added pressure on the city's transport system.

The pandemic posed significant challenges for local governments. The IMM lacked governmental funding, and the price for one passenger to use public transport increased six times to 18 Turkish Liras (TL) in the early days of the restrictions (Interview with the Deputy General Secretary, Toygar, 2020). In the early days of the pandemic, the average traffic index in İstanbul was measured as being at 20–30% of pre-Covid levels, while at the beginning of 2021, it increased to 42–43% of pre-Covid levels, exceeding 60% during peak hours (IMM Open Data Portal, 2021, cited in Ince et al., 2021). Using panel data between January and April 2020 in İstanbul, Shakibaei et al. (2021) compared the before and after and reported a significant decrease in trips for all purposes. The same study also reports an increase in the use of private vehicles, as with most places. Erbaş (2020) found that the decrease in the use of public transport depended on car ownership and commuting distance. Although these studies cannot be generalised to the population due to their sampling and timing, they reveal important insights into the mobility changes in İstanbul and the vulnerabilities related to pandemic-related mobility constraints.

Next, we present the research design in detail and describe the data used in the empirical analysis.

Methodology

This study was conducted in İstanbul in 2021 and followed a mixed-methods research (MMR) design, using qualitative and quantitative data collection and analysis methods. Mixed methods research is used to obtain data for complex research questions that require investigation and bringing together trends and individual experiences. As seen in the previous section, although there are some general trends in mobility implications of the pandemic, it is still impossible to provide a definitive problem formulation whereby the mixed methods design could enhance the explanatory power of the research (Elwood, 2009; Merten, 2015).

Data collection tools

The study follows an exploratory sequential design consisting of three structured online questionnaires, a baseline questionnaire and two four-week surveys conducted at different points in time, and one-to-one semi-structured phone interviews. Figure 1 presents the research stages and the critical milestones of the pandemic in Turkey. Both four-week periods were characterised by high infection levels, with the latter period having slightly higher infection rates. During these two four-week periods, the restrictions varied. Quantitative and qualitative data analysed in this study are as follows:

[Figure 1]

1) The baseline questionnaire: The first survey, consisting of 97 questions, was completed in January 2021. This initial questionnaire aimed to determine the basic sociodemographic information of the participants, their travel patterns, including the transport modes used, access to mobility goods and services, income and expenditure patterns, and their general attitudes towards the pandemic. The travel surveys of Transport for London and the IMM were used as the key sources for the transport-related questions (IMM, 2012; TfL, 2020). To understand the perceptions of and attitudes towards the pandemic, the previous Covid-19-related surveys of the İstanbul Planning Agency and Turkish Red Crescent were used (IPA 2021; Kızılay 2020).
2) The four-week short travel surveys: The first four-week survey was conducted on 19 February–19 March 2021, and the second on 21 May–18 June 2021. These surveys consisted of 21 questions to examine household mobility and spending changes during the pandemic.
3) One-to-one phone interviews were conducted with 16 people between May and August 2021 to understand the reasons behind the changes in their mobility practices considering their economic struggles.

Sampling

To reach the low-income groups living in İstanbul, the database of residents who applied for IMM social support was used.[1] The original population was 1 million. Given the nature of the fieldwork (online/phone), only households with computer, internet and mobile phone access were considered. This new population group consisted of 86,000 households. The data was further filtered for people aged 20–55, as this group were presumed to be the most mobile in normal times. Only households with an income level of 3000 TL and below (according to the income level 2020) were included in the sample. However, as shown in Table 1, some respondents stated that they lived in a household with an income of more than 3000 TL. The data on income is usually unreliable; given the precarity of this social group, the discrepancy was expected and considered in the analysis. Although the initial aim was to focus on those working at the time or actively seeking jobs, due to the precarity of employment within this group and the longitudinal nature of the study, it was impossible to focus on the working and job-seeking groups. The participants were selected from those who pay retirement contributions. Following these filters, the data was drawn for a sample of 1000 people using the "random" function from the PostgreSQL database. Consent was obtained from the participants for their participation in the research by calling 1000 people. Of 1000 people, 220 responded positively to the call, and of the 220 people, 159 participants returned the survey form. One participant stated they were illiterate and was excluded from the sample. The final sample in the panel data, therefore, included 158 participants. Participants who did not answer the questions were included in the selection and indicated as “NA” in the table below. The gender groups and geographical locations were randomly selected. The final dataset shared with the academic partners was anonymised. Table 1 shows the descriptive statistics of the survey data.

[Table 1]

The one-to-one interviewees were selected explicitly from the outliers, including those who needed to change their mobility patterns, commuted longer distances, bought cars during the pandemic, or altered their residential location. Table 2 below shows the sociodemographic information of the interviewees.

[Table 2]

[1] The data was only accessible to the policy collaborators. The applicants’ personal details were not shared with the academic team members.

Analysis

As part of an exploratory sequential design, this study first used quantitative data collection and analysis methods, followed by qualitative interviews. The classification by Onwuegbuzie and Leech (2005) is helpful to emphasise the exploratory nature of this work; the study used mainly descriptive statistics and thematic analysis for the quantitative and qualitative parts, respectively, as opposed to inferential statistics and theory-driven qualitative analysis/replicability. This is primarily due to several unknowns that need elucidating rather than explaining relationships in mobilities and economic vulnerabilities during the pandemic. The lack of statistical significance in the relationships between some variables does not ignore the relationships between these variables. Considering the sample is small and focused on a particular social group, it may not be possible to generalise, but it gives an idea about the trends, low-income groups and their diversity in the sample. In addition, because the quantitative data is panel data, it provides a dynamic analysis opportunity for the period in which the data is collected, even for a small sample.

The study has two main limitations. First, being unable to conduct face-to-face surveys and interviews during the pandemic made it necessary to complete the fieldwork online. Citizens who do not have access to a computer, phone, or internet connection and who applied for the social aid campaign were excluded from the scope of the research. Secondly, the problem of "participant attrition" emerged in the study. Of those who completed the first questionnaire, 158 could not complete all the weekly questionnaires. However, since the minimum level of participation was not lower than 90 throughout the process, and the economic profiles of the participants were quite close to each other, it did not significantly affect the survey results. Moreover, the small sample size did not allow us to quantitatively test our key variables' combined role using interaction terms such as the joint role of gender with employment status on the mobility trends. Therefore, our use of mixed methodology provided scope for exploring these issues.

Findings

Initial baseline survey

Perceived mobility restrictions

In the initial survey, the respondents were asked: "Do you feel that your mobility was restricted during the pandemic?" (Table 3). Of the 158 respondents, 68% said their mobility was restricted, while 32% stated otherwise. Of the male respondents, 70% responded positively, while this ratio was 67% for women. Regarding employment status, most of those who reported mobility restrictions were working or looking for a job. We also noted that those with higher levels of education responded "yes" to this question. As expected, those with already more elevated levels of mobility in regular times (i.e., male, higher educated, employed) reported that their mobility was restricted during the pandemic. We also checked how the responses changed regarding vehicle ownership and proximity to public transport services. More positive responses were provided among those who lived closer to bus stops. Individuals living far from public transport axes may have greater access to private vehicles, so they may not have felt their mobility was restricted. It may be that the mobility of individuals more dependent on public transport felt more restricted during the pandemic period. However, we cannot state the same for the metro users. Based on this study, there is no clear trend between the proximity to the metro and the perceived mobility restrictions.

[Table 3]

Changes to transport use

Almost half the respondents stated that their transport preferences changed during the Covid-19 pandemic; however, there are no significant differences depending on the socio-demographic characteristics of respondents. The responses did not vary based mainly on sex and employment. However, a noticeable contrast among vehicle owners who reported the pandemic greatly affected their transport preferences (68%) compared to non-car owners (46%). Concerning the changes in the transport modes used before and during the pandemic, we found that much to our expectations, public transport use decreased, especially in rubber tyre modes, including buses, dolmus, minibuses and BRT, while the metro usage increased. Yet, Marmaray, trams, and rail transit modes were preferred less than the metro. The slight increase in the use of the metro may be because of more trust during this period, as also observed by Aydin et al. (2022), who identified that the public saw ferryboats as the safest way to travel, followed by the metro. An unexpected result was the almost tripled personal vehicle use during the pandemic.

Weekly surveys

Mobility levels

The respondents were asked, "Did you leave the house for any reason in the last seven days?" in the weekly surveys. The mobility of the respondents remained high during the pandemic. During the first week of data collection, 89.1% of the participants indicated they had left the house; this figure was more than 90% for the remaining weeks. This can be seen with 86.9% of the non-working participants, 94.3% of the working participants and 97.3% of the job seekers who left the house during the eight weeks.

[Figure 2]

During the eight weeks, men's mobility was higher than women's (Figure 2). As the descriptive data shows, the mobility differences between men and women, one of the key mobility-related inequalities in İstanbul, stands out as an essential factor in mobility during the pandemic. Table 4 shows the panel regression analysis of mobility levels. The difference between the rates of men and women leaving the house is statistically significant in the total sample: men's mobility was higher than women's during the pandemic when we control for other individual and household characteristics. Moreover, when we repeat our panel regressions for those who were (1) working, (2) not working, and (3) looking for a job at the time of data collection, we find that the general mobility level between men and women is significantly different if they are looking for a job with women having around 6% lower mobility levels than men in the same sub-sample. Furthermore, the presence of chronic illness in the household and education levels were also statistically associated with mobility levels for the sub-sample of those who were looking for a job, although the sample is very small.

[Table 4]

Given pandemic-related health risks and care responsibilities were reported to be the main reasons for not leaving the house during the eight weeks, we examined the role of care responsibilities on mobility, capturing the role of the presence of children in the household (Table 5). Although there was no statistical significance of having children in men's mobility, the negative role of having children on women's mobility was statistically significant. There was a 95.5% probability of men leaving the house,

even if they had children; the rate of men not leaving the house when there were children at home is only 4.5%. Women with children under 16 were around 3 percentage points less likely to go out than women without young children, but they did go out less often than men, regardless of whether they have children. The results show that women with young children went out 7.4 percentage points less often than men in similar situations.

[Table 5]

As Table 6 shows, most of the trips were made for work purposes, followed by shopping trips, and then trips made for health and socialisation purposes.

[Table 6]

Work-related mobility

Although we found that the general mobility level of women was lower than men during the pandemic, we still wanted to check if this gender gap in mobility is due to the employment gap between women and men because most trips were work-related. Women travelled far less for work purposes than men, and the mobility of those with lower levels of education was higher until the seventh week (Figure 3). This could be due to the restrictions that led to closing shops and restaurants by the end of the sixth week. Moreover, the generally low level of work-related mobility between men and women is also because of structural gender gaps in employment and labour force participation in Turkey.

[Figure 3]

Confirming this, the panel regression analysis findings show a negative statistically significant association between being a woman and leaving the house for work purposes (work-related mobility) during the pandemic (Table 7). This could be explained by the lower employment levels of women in paid jobs compared to men However, it is important to note that the work-related mobility variable in this regression covers work trips that were out of home, and, therefore, it does not reflect the women's extra burden of unpaid domestic work during the pandemic (Chauhan, 2021).

[Table 7]

The data also shows that men spent more time travelling to work than women (Figure 4). In March 2021 and early June 2021, this difference appears to be at its highest level in eight weeks. Considering these periods coincide with the tightening of the restrictions, it is possible to say that women travelled shorter distances with pandemic-related restrictions, even for work.

[Figure 4]

However, the panel regression analysis does not show a statistically significant association between sex and commuting duration (Table 8). Our commuting duration variables is an ordered categorical variable from 1 to 9 where the category 1 is for those respondents who said that their duration was less than 5 minutes; 2 if the duration is between 6 to 15 min; it is 3 if it is between 15 and 30 minutes .and so on . We transformed this variable into a duration variable by taking the mean values so that its unit of measurement is in minutes. In order words, we assumed that the commuting duration for work trip is, for example, 3 minutes if someone reported that it is between 1 to 5 minutes. Using this

duration variable as our dependent variable, w e find that the commuting duration is positively associated with household income per person. Moreover, vehicle ownership decreases commuting duration during the pandemic by around 23 minutes, on average. This is interesting because congestion could normally cause a higher commuting duration to work, particularly during peak hours. Therefore, using Metrobus, for example, might be advantageous for the purpose of having a shorter commuting duration. Therefore, our finding of the negative relationship between commuting duration and vehicle ownership could be either related to the distance of workplaces being shorter for people with a private vehicle or having lower levels of congestion during the pandemic.

[Table 8]

The data shows that most of the respondents work in the service sector. However, commuting times are shorter for those who work in the manufacturing sector. Moreover, commuting times increased for those working in the service sector over the eight weeks, but not in the manufacturing sector. This trend can be explained by the fact that the manufacturing sector needs more specific skills that cannot be easily obtained; hence it is less flexible. However, those working in the manufacturing sector may live nearby, or those working in the service sector may have changed jobs, as a result of the higher levels of business closures and job losses in the service sector.

Looking at the transport modes during the eight-week period, we observe that the use of public transport varied the most over the eight-week period. The data shows that the use of public transport increased towards the end of the four-week period of the study (i.e., changes with the openings). This could indicate that the restrictions that came with the pandemic – as expected – had the most impact on public transport. However, considering most work trips are made by public transport, these changes can also be explained by the closures of businesses and lay-offs. Work shuttles and motorcycle use remained almost constant, while a relatively more variable trend was observed in the use of private vehicles and walking.

Shopping-related mobility

Figure 6 shows the difference in shopping trips made by men and women. Women's shopping-related mobility was much higher than that of men. Table 9 presents the panel regression analysis of shopping-related mobility. The results show a positive and statistically significant association between being a woman and going out shopping during the pandemic, controlling for age, income, education, vehicle ownership and the presence of chronic illness in the household.

[Figure 5]

[Table 9]

Public transport use

The use of public transport was lower among those with primary education only. Until week six, men in the sample used public transport more than women. Between weeks six and eight, women used public transport more than men. The regression results presented in Figure 6 show that women had lower rates of using public transport than men, and participants with secondary school and below education level had lower rates of using public transport than those with high school and equivalent education.

Moreover, as the second column of Table 10 shows, the effect of sex disappears after controlling for working status.

[Figure 6]

[Table 10]

The respondents were asked to state whether they agreed with the statement, "I was worried about getting infected when using public transport". The answers were coded as a 5-point Likert-scale variable where it is equal to 1 if respondents "strongly disagree" and it is equal to 5 if they "strongly agree" with the statement. In other words, we assume that the higher the value of our dependent variable, the higher the anxiety level of respondents due to using public transport. While the level of anxiety was observed to be higher in those with lower levels of education, there was no difference among men and women – except for the last week. Moreover, the regression analysis shows a statistically significant relationship between individuals' working status and their anxiety level. Expectedly, we find that those who do not work have higher anxiety levels than those who work, and this could be because it is not necessary for them to use public transport regularly. Moreover, we also find that those who are looking for a job are more worried about getting infected when using public transport. This could be related to the higher usage of public transportation by people in this category, as they might need more public transportation rides during their job search. Age, sex and education level did not influence the levels of anxiety when using public transport, but it increased with household income per person.

Transport expenditure

17 respondents in the sample spent the most or the second highest on transport at least once in the eight weeks. According to the answers, most of the participants in this group were generally male, had a job and were in the age group 30–39. In income groups, the largest or second largest part of the monthly expenditure of the group with a household income of 2000–3000 TL was spent on transportation. Two of the 16 participants who could not find a job had the greatest expenditure on transport.

One-to-one interviews

The interviews complemented the quantitative analysis by providing possible explanations for the trends observed and the everyday life challenges. The themes generated can be grouped into everyday mobility and economic challenges, and household dynamics.

Everyday im/mobility and economic challenges

The use of public transport was one of the key discussion themes in the interviews. The challenges concerning transport during the pandemic tend to be described in spatial terms or in terms of the transport modes used. For example, the participants reported the cleanliness of buses and bus stops and the proximity of stops to the hospital as significant factors that affected their perceived risk associated with public transport. Some of the coping strategies entail embodied perceptions of public transport: "One of the reasons why I prefer buses is that for the metro, you have to go underground, and it creates the feeling of not getting any air … you descend many floors … it creates the feeling of not taking off." As can be seen in this example, personal perceptions play an important role in evaluating the risks of

public transport. Using the "Life fits into home" (HES) code[2] also gave some participants confidence. Some mentioned that because of the HES code, using public transport was perceived as safer than going to grocery shops. In the context of everyday mobility, work shuttles also emerged as an essential theme. When asked how they went to work during the pandemic, one of the participants said their company started providing work shuttles after the pandemic. The reason was that the company wanted them to refrain from using public transport to avoid infection from outside the firm.

A key finding from the surveys is that transport constituted the highest budget item among those looking for a job, which is also confirmed in the interviews in different ways. It is also possible to claim from the interviews that transport costs play a critical role in the lowest income group across households of different structures (e.g., single mothers, women with no children, married men with children). Almost all those that mentioned the travel costs implied a direct relationship between poverty and mobility and the need for financial support for transport. One of them even indicated that they use the transport support they receive for buying food. Some also mentioned the value of time as well as money, raising concerns about the transfers and costs. These examples reinforce the interrelatedness of the cost of transport in monetary and temporal terms and the everyday economic challenges.

The nature of the jobs and the sectors in which the respondents worked played a vital role in their perceptions of the risks when travelling. The mobile nature of the jobs in different sectors emerged as a significant factor in this social group. The respondents explained the sector-specific implications of the pandemic on their economic well-being in different ways. Some emphasised the essential nature of their job. Some of them, especially those doing low-skilled manual work, referred to the rigidity of their working hours. While some specifically highlighted the nature of their sectors in explaining the ramifications of the pandemic: “Employers in the food industry hit bottom … Our family helped us a lot financially, I got through this process like that … At one point, I even thought of selling my household items”. Considering the entrepreneurial elements of occupations that require mobile labour (e.g., driving daily), such as running a school bus service, the economic implications of imposed immobility that prevent one from working should be considered multifaceted. Running a school bus service requires individual responsibility for the maintenance of vehicles, which comes with financial risks. Being unable to work due to school closures reduces the value of their capital and complicates their responsibilities, such as loan payments.

Meanings of household mobility patterns and decisions

The interviews provided insights into the changes in living spaces from everyday and life-course perspectives and explained some trends observed in the eight-week data. The negative economic, social and spatial implications of immobility tended to play an essential role in the families' concerns about the well-being of their children. The parents, in particular, highlighted the lack of sociability, which they said is a consequence of not having to access public parks and homeschooling as their primary concern for the future.

During the pandemic, shopping was the second most common reason people left home. The women in the sample were more likely to go shopping than men. However, the pandemic has also changed the meaning of shopping trips. Some male participants saw it as their responsibility to shop because they felt it was unsafe for women and children to go to grocery shops. On the other hand, some female

[2] A mobile application introduced by the Turkish Ministry of Health in the early days of the pandemic to track individuals infected with Covid-19. The application was also used by members of the public to check the geographical spread of the virus and their turn for vaccinations.

participants saw shopping trips as a coping mechanism during these challenging times. For instance, a non-working married woman mentioned that she planned her shopping trips well in advance to make her time in shops productive and minimize her visits. The examples of changing meanings given to trips and the concerns over children's future due to current mobility and space issues highlight the broader gender dynamics and the economic implications of immobility, which have been further discussed elsewhere (Akyelken, 2024).

Regarding household dynamics, deciding to purchase a car is an important decision. According to surveys, private car use has almost tripled, and shared vehicle use and walking have increased significantly. On the other hand, public transport use has decreased slightly, with only a small increase in metro use. During our interviews, we aimed to understand these trends and explore participants' thoughts on owning and using a car. Interestingly, two participants had already considered buying a car before the pandemic and started driving. This suggests that the increase in private vehicle use is not only due to pandemic-related health concerns but also to changes in household dynamics resulting from the pandemic.

Discussion and wider implications

Mobility sanctions issued by the Turkish government helped us frame the impacts of the pandemic on the daily mobility experiences and perceptions of participants in Istanbul at different intervals. The baseline dataset, created in January 2021 through an initial survey with the participants directly reporting their mobility restrictions and transportation preferences, combined with weekly collected data and one-to-one interviews, helped us understand small and more significant changes in the process. The interpretation of these trends with the participants' financial distress and economic transformations in everyday life also shed light on the effects of economic vulnerabilities on mobility during the pandemic. Conceptually, the research is based on mobility studies, which delve into the significance of everyday mobility at different levels and examine mobility experiences beyond simply moving from one place to another. The study also considered the importance of infrastructure, services, and social and spatial inequalities to broaden the scope. The study focussed on low-income groups who live and work in Istanbul, emphasising the economic dimension of the urban and mobility inequalities that have deepened due to the pandemic.

Findings can be classified into different categories, but the most important findings are related to mobility, perceptions, and trip purposes. The perceptions of the participants on their mobility during the pandemic were not entirely aligned with the actual trends in mobility. According to the survey, more than 89% of the participants reported a high level of mobility despite the pandemic. However, 68% of the participants said that their mobility was restricted. The initial survey found that those who were more active before the pandemic, such as male participants, employed participants, and those with higher education levels, reported more restricted mobility.

Additionally, respondents more dependent on public transport were more likely to report restricted mobility levels. The data also showed that gender was significantly associated with mobility during the pandemic. Men were found to have higher mobility levels than women, and their mobility levels were not as affected by the presence of children in the household. These gender differences were consistent with the low female labour force participation levels in Turkey. Most of the trips conducted during the pandemic were work-related. Statistically significant gender differences were observed in work-related mobility, with women reporting more restricted mobility levels than men. Income was also positively associated with the duration of work-related trips. Finally, public transport was the most affected mode

during the pandemic, while work shuttles and motorcycle use have remained almost constant. Private vehicle use and walking showed a more variable trend.

We have identified five important contributions to understanding how people with low incomes in Istanbul move around cities during the pandemic. First, it is important to note that this study did not compare income groups and cannot draw conclusions about the role of economic inequality and its implications. However, it does contribute to the growing body of research that suggests low-income populations remained active during the pandemic. Previous studies suggest low-income groups stayed active during the pandemic due to being essential workers, facing financial difficulties, or struggling to comply with restrictions. This paper provides additional insights into the importance of household structures, social networks, and the experience of urban stagnation in everyday lives when understanding mobility trends by income. The combination of weekly surveys and qualitative data collection allowed for a comprehensive analysis of the impact of the pandemic on mobility, including the perception of restricted mobility.

Second, the findings also contribute to the debate on the environmental sustainability implications of pandemic mobilities. The general decrease in the use of public transport and the increase in private vehicles during the pandemic have been defined as one of the most alarming trends in environmental sustainability (Basu & Ferreira, 2021). While this paper shows some supporting evidence for this trend, it also shows the importance of non-health-related factors in changing transport preferences during the pandemic. The pandemic has been more of a trigger than a reason for private vehicle purchases. The participants had already planned the purchase of vehicles for various economic reasons (e.g., changing jobs or opening a workplace, or having a job requiring a private vehicle), and the pandemic only encouraged and accelerated this process. Therefore, the anticipated travel behaviour changes due to sudden shocks to everyday life should be based on broader economic dynamics.

Third, the pandemic has had a significant impact on the nature of work and the types of jobs that people have. Mobility and infections have been major concerns, and the mobile nature of work has been a key factor in economic and mobility challenges. The extent to which people were able to move around during the pandemic depended largely on the type of work they had. The changes in commuting time between the service and manufacturing sectors also shed light on the nature of manufacturing work. The stories shared during interviews further illustrate the challenges faced by people in different occupations. For instance, a school bus driver who was unable to work due to school closures struggled to repay their loan for a new vehicle, while an estate agent who can work from home but leaves their home to show nearby flats to consumers faces different challenges due to the degree of mobility involved in their job. Considering the mobility patterns of various occupational groups, post-pandemic support should include transport packages with significant social and economic components.

Fourth, existing inequalities have persisted and even deepened during the pandemic. This trend is observed in other Global South contexts (e.g., Auld & Renckens, 2021; Wachtler et al., 2020). Some of the findings align with the existing literature, such as how gender roles are constructed in society and affect mobilities and the mobility restrictions imposed on women, especially with childcare duties (Caselli et al., 2022; Kabeer et al., 2021). The persistence of such inequalities partly depends on the nature of work, as explained above, and the employment situation. Although women's participation in labour increased slightly in the last year and reached 31.2%, it is still very low compared to men, whose employment rate is 66.9%, and Turkey has the lowest female labour force participation rate amongst the Organisation for Economic Co-operation and Development countries (TURKSTAT, 2023; OECD, 2022).

Moreover, working women suffer from a lack of affordable childcare facilities, which poses another threat to their employment rates and cultural factors. The impact of work and mobility transformations on long-term gender inequalities during the pandemic should be given particular attention. Familial concerns raised by all parents, especially women, raise important questions about social mobility. As understood from some participants' concerns about their children, the anxiety that comes with mobility in the pandemic should be treated carefully as it may not remain on a daily and instrumental basis but also throughout their lifetime. This intra-generational equity has been mentioned in many feminist recovery plans and should be mainstreamed in the post-pandemic transport and social policy agenda (Kabeer et al., 2021).

Finally, how the residents perceived their mobility during the pandemic is also essential. More of those who tended to be more mobile in the pre-pandemic times said their mobility was restricted during the pandemic. Combined with the evidence of the dependence of the relatively immobile population on their residential environments (e.g., Memlük Çobanoğlu & Akkar Ercan, 2023), spatial strategies of the urban dwellers become even more dependent on their perceived mobility and ease of access.

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