Women's mobility and transport in the peripheries of three African cities: Reflecting on early impacts of COVID-19

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A B S T R A C T

This paper reflects on the mobility experiences of women in African cities in COVID-19, based on research conducted both prior to and following entry into the COVID-19 'moment'. It draws on material collected during an ongoing action research study aimed at addressing the everyday transport and mobility challenges faced by young women living in poor peripheral communities of three African cities – Abuja, Cape Town and Tunis. The project has the specific objective of supporting young women's improved access to employment opportunities through trialling various mobility/transport-related skills interventions (based on prior in-depth analysis of mobility constraints). With the onset of COVID-19 some readjustments to the research focus and planned interventions became necessary. The research teams, together with an NGO partner, are now working to chart how young women's everyday experiences of mobility and transport - both as transport users and as transport sector workers - are changing as processes of lockdown and their relaxation evolve. The paper covers the period from early 2019 through to March 2021, and offers reflections regarding 'lived experiences' of mobility practice pre-pandemic, during the pandemic, and the potential longer-term mobility-related impacts for women resident in low-income neighbourhoods in a post-COVID-19 era. This leads to consideration of key policy lessons. There is potential for prioritisation of Non-Motorised Transport interventions towards a green restart that would benefit women (for instance through promoting women's cycling), and for growing women's participation as transport operators, even perhaps the usage of drones to aid women's safer pedestrian travel. But such interventions will require far greater representation of women in COVID-19 and wider transport decision-making entities than has hitherto been the case.

1. Introduction

Since the onset of the COVID-19 pandemic in mid-March 2020, early fears regarding the severity of potential impacts on the poorest populations, especially women, are being confirmed (de Paz et al., 2020). Mobility and transportation have played a central role in spread of the disease across Africa, from its arrival along with (many elite) travelers flying into major African transport hubs from Europe or Asia, to its remarkably rapid pace of transmission within crowded city environments. As Dalkmann et al. (2020) observe, 'transport is at the heart of the COVID-19 crisis.' In the absence of widespread access to vaccines, careful control of mobility and transport is still perceived as central to defeat of the disease. Lockdown has become a key term in the COVID-19 lexicon: it implies and imposes stasis. Lockdown in the first phase of the pandemic in most African countries was imposed with little warning - plans for release in this phase, and in subsequent lockdowns, have proved more difficult to craft, especially amidst public protests against lockdown policing and associated political wrangling.

For the vulnerable women that are the focus of this paper, transport and mobility challenges are nothing new: COVID-19, however, has

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generated further, previously unimaginable complexities. The paper draws on work conducted during an ambitious, ongoing action research project in poor peripheral communities of three cities: Abuja, Cape Town and Tunis. The wider project aims not only to understand the everyday transport and mobility challenges faced by young women living in these locations, but also to pilot interventions to improve their skills in engaging with the transport sector, whether as users or workers/ employees. Our focus extends beyond transportation *per se* (the act of moving goods or people), to encompass reflections concerning mobilities (the ability to freely move or be moved), following an approach that has been widely adopted by researchers working at the intersection of transport science and social science (Grieco and Urry 2011:1). The approach is particularly appropriate for research centred around the challenges to free movement experienced by many young women in the study locations.

Research was well underway with in-depth qualitative baseline studies (essential to developing potential interventions for piloting) when COVID-19 intervened. Consequently, the research focus has had to be readjusted: face-to-face field research is no longer feasible with 'social distancing' and travel bans in place; online interviewing meanwhile raises significant ethical challenges given the study focus on particularly vulnerable people. The research teams are now working together to chart how young women's everyday experiences of mobility and transport are changing as processes of lockdown and its relaxation evolve. Rajan et al. (2020) observe that information and evidence regarding the lived experiences and everyday challenges faced by social groups during enforced isolation tend to be overlooked. This paper aims to help address this evidence gap. It encompasses consideration of women as (actual or potential) transport users and also women who are transport sector workers. Looking beyond current exigencies, the authors also tentatively reflect on how current experiences could reshape post-COVID transport and mobility practices.

A distinguishing strength of this study is that data collection and analysis of COVID-19 impacts on women's mobility in the three study cities follow through directly from prior research and analysis of pre-pandemic conditions in the same locations, by the same research team, including peer researchers from the same study communities. The paper commences with a short review of pre-pandemic literature on gendered mobility and other background context, together with an introduction to the study locations and an outline of the pre-pandemic methodology. This is followed by a review of major factors that fieldwork indicated were shaping young women's mobilities in low-income areas of the three cities up to the time the research was interrupted. The second part of the paper focuses on COVID-19 and its impacts, firstly noting changes to the methodology and referencing emerging COVID-19-focused literature, then identifying major questions that have been challenging the team in this latest, unanticipated phase of research. Although the research encompasses three very diverse city contexts, it is possible to identify some common themes regarding mobility-related impacts on women's well-being in low income areas and then move forward to reflect on potential longer-term impacts post-COVID-19 and associated policy lessons.

2. Gendered mobilities in Africa, pre-COVID-19

Recognition of the fact that transport is a key enabler for women to access opportunities such as health services, education facilities, etc. - and that women's mobility needs and practices tend to differ substantially from those of men - is still not adequately reflected in policy in most low-income countries, particularly in Africa (Porter, Abane and Lucas 2020). To take just one example, access to jobs, Woldemichael (2020) notes that lack of safe transportation for women to and from work is associated with a 15.5% lower labour force participation rate for women across developing countries: he estimates that had African countries achieved the same rate of female to male participation as high-income countries, the continent would have an additional 44

million women actively participating in its labour markets, with potential GDP gains from 1% in Senegal to 50% in Niger. Africa's highly gendered transport arena is a major travel deterrent for a majority of women: men not only still dominate all types of vehicle ownership and operation but set the 'atmosphere' within which women must negotiate their journeys (Fernando and Porter 2002; Porter 2008, 2011; Peters 2013; Pedersen 2020). Discrimination against women is also a key feature of employment within the transport sector in Africa (Porter 2008; Wright 2018). The two elements are inter-related since women's lack of visibility as workers in the sector contributes to male dominance of transport and travel operations as well as both perceived and real women's safety. This also partly accounts for transport planning which is both gender blind and gender-biased (Priya Uteng 2011; Priya Uteng and Turner 2019). Additionally, it is important to note that some young women face family/society-imposed constraints on their mobility, being seen as highly vulnerable and needing protection (Porter 2011). The overall impact is to discriminate against women both as transport users and sector employees.

In African cities, women are discriminated against widely with regards to access to safe spaces, not least at transport hubs and on public transport (UNWomen 2017; Porter et al., 2017). Detailed analyses of the challenges faced by women in individual African cities are still relatively rare (Porter, Abane and Lucas 2020): for low-income areas, early work by Venter et al. in Durban (2007) and by Salon and Gulyani in Nairobi (2010) is particularly notable. For the cities considered in this paper there are a few studies pointing to the vulnerability of women, particularly on public transport (ActionAid 2016 for Abuja; Vanderschuren et al., 2019 for Cape Town; Martin 2017 for Tunis). This paper takes these studies forward through its specific focus on the challenges faced by young women (prior to, and in the pandemic) in some of the lowest income areas of each city periphery. Young females resident here face particularly severe social and economic exclusions that promote unemployment and poverty.[1] With extremely poor access to financial resources, they are likely to be more dependent on walking and the cheapest public transport, making them especially vulnerable to harassment, particularly if they travel alone (Porter, Abane and Lucas 2020).

The cities selected for the research – Abuja, Cape Town, Tunis – offered the opportunity to explore impacts on transport practices in three very different cultural, socio-economic and political environments. While each city-region has relatively high employment potential, by comparison with other parts of their respective country, youth employment for the majority of those resident in the city peripheries (common location of recent migrants and low-income families) is typically in precarious, poorly paid, informal sector work, especially in Tunis and Abuja. (In South Africa the formal economy plays a somewhat larger role due to the apartheid legacy of restriction on informal activities, see Filmer et al., 2014). For young women, opportunities are particularly sparse and tend to revolve around petty trade, food processing and service activities such as hairdressing, together with agriculture in rural sites (as the research teams noted during a preliminary review of available data for each city). Young women living in these locations are the least likely to own or have access to private cars, are more dependent on walking or public and para-transport systems, are most likely to need to travel further in search of work opportunities, and are therefore especially vulnerable (mirroring earlier observations in low-income areas of Durban by Venter et al., 2007). The wider economic context contributes to this deprivation: these peripheries sit within neo-liberalising economic development strategies that have encouraged the retrenchment of public service delivery, relative deprivation of resources compared to more central urban locations, and poor infrastructures.

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[1] Persistent failure to collect gender-disaggregated data in the transport sector contributes to inadequate recognition of women's disadvantage.

These conditions have encouraged a research focus on the practices, experiences and needs of young women resident in two different types of peripheral settlement: firstly, sites located just within the city boundaries and, secondly, locations that lie just outside the city boundaries but are linked to the city by employment/daily travel. This spatial approach applies an extended notion of *in-between geographies* to the wider city region, with multiple cores and peripheries connected through movement, encounter and exchange and the notion of peripheries as generative spaces of possibility with potential to destabilise the centre (Berdiel 2018; Simone 2010). At the same time, a more extensive research net has been drawn for each city that encompasses the city-wide transport assemblage of actors (male and female), institutions, and infrastructure essential to the full contextualisation of transport and mobility conditions at the periphery.

3. Project methodology, prior to the pandemic

In order to help address the issues faced by disadvantaged young women living in urban peripheries, the authors commenced this multi-disciplinary (social science-based) action research study early in 2019. The specific focus was on helping them improve their transport-related skills and thus improve their employment opportunities. It aimed to address potential needs of women both as transport users and as workers in the transport sector, utilizing a qualitative methodology built around in-depth interviews, focus groups, mobile 'go-along' interviews and mobility diaries, mostly conducted in a highly participatory way. These methods, although still fairly unconventional in transport planning (where field methodology has typically been centred round large-scale quantitative surveys of current travel patterns), are gradually attracting attention of transport researchers as a route to uncover complex transport decision-making practices and routines (e.g. Seedat et al., 2006; Lucas 2011; Plyushteva and Schwanen 2018; Porter, Abane and Lucas 2020). They are essential for achieving the project's central objective of understanding women's *unmet* transport-related needs.

The research methodology is set within a distinctive collaborative framework. Field research commenced with the recruitment and training of six unemployed young women (all between 18 and 35 years old) from two low-income study communities in each city as co-researchers, following previous work identifying peer researchers as a valuable entry point for mobilities-focused research among vulnerable groups (Porter, 2016). Initial investigations conducted by the peer researchers – personal mobility diaries, observations and interviews with their peers in the target age group (15–35 years) - helped identify key research questions which were then pursued further by the academic teams. This second phase encompassed in-depth interviews and focus groups with young women on their transport to work/school experiences and aspirations; with major transport employers, small transport business owners and transport sector employees; also with men in the study communities and in the wider transport sector regarding their views of women's potential to work successfully in it. At the start of the project, Country Consultative Groups (CCGs) were also established to ensure regular engagement with policy makers, practitioners and private sector actors, including relevant ministries, NGOs and unions, to advise and comment on emerging findings, and then aid the identification, implementation and evaluation of planned pilot skills interventions.[2]

Following an intensive phase of data collection, the Tunis team was in the process of designing the first pilot interventions for that city together with local CCG members, when COVID-19 intervened. No face-to-face field research could continue in any of the sites once lockdowns were instituted. Field staff were also advised immediately to avoid

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[2] Some pilot interventions will be aimed at helping young women build skills as transport users and some at building skills towards women's employment in the transport sector.

phone interviews given the stress that local contacts were reporting. Given ongoing difficulties regarding disease control in all three study cities, work is now in progress also to redesign the skills training plans, focusing on online activities.

4. Factors shaping young women's mobility in low-income areas in Abuja, Cape Town and Tunis prior to onset of the pandemic

Fortuitously, by the time the pandemic took hold in the project study sites, an extensive project dataset had been established, especially for Abuja and Tunis. This comprises transcripts of c.300 in-depth interviews and 28 focus groups, together with travel diaries by 18 peer researchers. Thematic analysis of these data enable some broad observations regarding women's mobility in poor peripheral districts that are pertinent when considering subsequent COVID-19 impacts. Features evident across all six research sites can be summarised as follows:

- Patriarchal cultures and transport deficiencies prevail and together shape the overall context in which young women's lives and life chances unfold in all the study sites. Employment within the transport sector, city-wide, is dominated by male operators: automobility is a male domain. In Tunis and Cape Town, small numbers of women have been able to take up white-collar administrative roles but most women in all three cities are only able to access the lowest paid work (notably ticket selling, cleaning). There are very few women driving vehicles (taxis, Uber/Bolt, school buses), whether employed or self-employed; even fewer work as motor mechanics.
- Young women have fewer resources and opportunities than men in the low-income study locations. This both affects and reflects their poor access to motorised transport. Diverse factors are at play: a) public transport availability is low and/or unreliable: the poorest neighbourhoods are particularly poorly served by transport, especially at night; b) women have less income available to pay fares; c) very few young women have access to a car for personal use and cycling is extremely rare among young women; d) harassment of women, especially on public transport, deters some from regular usage; and e) some young women, especially in Tunis and Abuja, face family/society-imposed constraints on their mobility: they are seen as highly vulnerable and needing protection.
- Pushing, stealing, verbal and sexual harassment are all widespread, on public transport and at bus and train stations, taxi ranks and other transport hubs. The strongest evidence of sexual harassment inhibiting women's job search and employment comes from Tunis. In Cape Town and Abuja, precarity forces many women to travel in their search for income, despite harassment. In all three cities the project's focus on skills development also requires attention to ways of improving men's behaviour. Discussion is ongoing with respective Country Consultative Groups regarding potentially appropriate approaches in each of these very different cultural contexts.
- Women needing to travel will patronise whatever transport is available to them that they can afford. Lower-cost options include collective taxis (Tunis), motorcycle taxis and tricycles (Abuja), trains and minibus taxis (Cape Town). When women have the funds available, they will pay for safer transport, especially after dark (for instance, in Cape Town, Uber rather than township collecting taxis and bus rather than train). For the poorest – and wherever motor transport is rarely available - walking may be the only option, but it is constrained by women's fear of attack/mugging, especially after dark when street lighting is so often absent or defunct. Women then endeavour to walk in groups for safety.

5. Reshaping project research methods in response to COVID-19

With face-to-face fieldwork and planned pilot interventions on hold, project efforts were immediately redirected towards logging COVID-19 transport/mobility policy and its impacts on gendered mobility

practices with particular reference to the low-income study neighbourhoods. Some research assistants and peer researchers would have continued with active face-to-face research despite the risks (not least because casual employment is now even harder to come by and prices of food and other essential goods have escalated),[3] but strict university and project ethical protocols have prevented this. It has also been necessary to remain mindful of the potential sensitivities of staff conducting interviews by mobile phone, given the ongoing stresses being experienced by many respondents, whatever their economic status. Reportage of in-country project staff indicates the volatility prevailing in the low-income study neighbourhoods, but the team's better-resourced private and government contacts also face enormous stress as they try to continue professional operations.

Consequently, it was necessary to change the research approach to online review of government and media reports and documentation of personal experiences and observations through mobility diaries (*see Website* https://transportandyouthemploymentinafrica.com/ *Anonymised*). The mobility-focused diaries, mostly written by project peer researchers, chart their everyday physical and virtual (mobile phone/social media) mobilities and perceived changes/challenges. To date 135 individual daily diary entries (from 12 diarists) for Abuja, 213 (from 4 diarists) for Cape Town, and 71 (from 6 diarists) for Tunis have been reviewed and thematically analysed. Further triangulation has been achieved through occasional meetings with CCG members, personal reportage of in-country project staff and careful tracking and analysis of online government reports, (verifiable) local newspaper/media reportage, and a wider emerging literature. These data prompted a set of research questions (set out in Section 7) that are also potentially relevant to other researchers concerned with urban mobility in low-income economies.

6. Gendered mobility in COVID times: emerging literature

Once the pandemic set in, in middle- and low-income countries, concern regarding the potential impact on women's mobility and its wider implications started to gain momentum. For Asia this has led to a recent study by Shah, Rajiv and Lokre (April 2021, a Delhi-focused study set within a wider Asia review). In Africa, within weeks of the onset of the pandemic, the Flone Initiative (April 2020) published a small survey of its impact on 30 women transport workers in Nairobi: this included job loss, food insecurity, anxiety regarding infection, and police brutality when working outside curfew hours. Meanwhile, the authors of this paper immediately redirected the mobilities research already in progress with women in Abuja, Tunis and Cape Town towards a first, very preliminary assessment of COVID-19 impacts both for women users and women transport workers (presented at a PIARC/UK Department of International Development High Volume Transport programme webinar on COVID-19 and women in mid-May 2020, alongside research from Flone and the International Transport Workers' Federation).[4]

Some early studies highlighted emerging COVID-related challenges faced by transport sector workers and others with customer-facing/cleaning roles (Flone 2020; Dalkmann and Turner 2020; International Transport Workers' Federation 2020). UNHabitat (May 2020) emphasised the need to ensure that public transport did not become a casualty of the pandemic. Subsequently, Jennings et al. (December 2020) produced

a review of impacts on women in sub-Saharan African cities. This draws on the preliminary findings from the above and other studies and telephone interviews with key informants for Kenya, Nigeria, South Africa and Uganda (including authors of this paper). The broad themes referenced in that review (economic impact, impact on women transport users, impact on women workers and on women's quality of life) are ones that had already been identified as likely key issues in the project study sites: they are examined in some detail in ensuing sections of the paper.

The impact of COVID-19 on many women's lives in African cities has been dramatic. As Rajan (2020) points out, self-isolation is a privilege of the rich: women living in poor communities still have to go outside the home to source food and water and to obtain income, however dangerous. Concerns were raised particularly early in South Africa: Hara et al. (2020) observed women living in Cape Town's townships struggling daily to source water, despite its crucial significance in disease control. Increased threats from police and military violence associated with lockdown restrictions/curfews and wider insecurity and criminality posed further dangers for women in this city (Kihato and Landau 2020). Regarding women and the need to access income, Peden and Kobusingye (2020) reference a GeoPoll survey in Africa reporting only 20% of participants being able to work from home and suggest this can be linked to workers having jobs that cannot be conducted from home, plus low levels of internet connectivity. With regard to the latter issue, it is important to note that, while virtual mobility as a complement to physical mobility has been building for some time in Africa, women's access to the internet (including internet-enabled phones) still tends to be lower than men's (Porter et al., 2020).

It is also pertinent to consider the issue of Gender-Based Violence (GBV), including Intimate Partner Violence, albeit not a common theme in transport studies. Men's and women's mobility across all social groups has been curtailed to an unprecedented extent during lockdowns, but stasis particularly impacts men's normal routines (usually incorporating considerable time each day outside the home, working, or for social and religious activities). When families are confined in homes with limited space, frustration and rising tensions are almost inevitable: unreliable services, dwindling food supplies and rent debts can add further pressure (Obeng-Odoom 2020). Global evidence of expanding home-based violence during the pandemic leads UNWomen to term this a 'shadow pandemic'[5] (Mittal and Singh 2020).

At the same time, reflections are emerging as to potential post-pandemic futures that are more sensitive to women's mobility needs. The World Economic Forum's Covid Action Platform (Ypma et al., 2020), looking optimistically at women's mobility on the global scene, stresses the opportunities for improvement in women's mobility experiences, through emphasis on inclusivity, participatory design between users and providers and prioritisation of pedestrians. More cautiously, the International Transport Workers' Federation (2020) warns of the potential for an exacerbation of existing inequalities and calls for measures to support women transport workers during the pandemic (income protection; access to appropriate sanitation; PPE suitable for women's bodies, when required; ending violence and harassment of women). They advocate for gender impact assessments and a gender responsive approach that can bring about a 'gender equal new normal', with good jobs for all transport workers. Post-pandemic futures in the study cities are explored in section 9 of this paper.

7. Some key research questions on mobility impacts of the pandemic

The need to rapidly reshape project work in the study cities

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[3] Rice, for instance, rose 30% in Nigerian retail markets in just 4 days in late March 2020: https://www.bloomberg.com/news/articles/2020-04-06/key-food-prices-are-surging-after-virus-upends-supply-chains last accessed 10/02/2021. In South Africa low income families reportedly faced increases of 30% in a basic food basket over the 2 months following lockdown: https://www.capetownetc.com/news/food-prices-increase-by-30-in-two-months-says-report/last accessed 10/02/2021.

[4] Webinar: The impact of COVID-19 on women in transport (piarc.org) Last accessed 06/05/2021.

[5] https://www.unwomen.org/en/news/in-focus/in-focus-gender-equality-in-covid-19-response/violence-against-women-during-covid-19. Last accessed 04/02/2021.

encouraged early formulation of key questions (April 2020). These have been explored over the past year.

- The first is project-specific: will data gathered prior to the pandemic still form a valid base for planned pilots in the study sites, or will changes be so substantial that full reassessment of conditions on the ground is required?

Other questions have wider relevance across African cities:

- What are the knock-on impacts on the well-being of women resident in low-income areas regarding access to food, health services, education and training, livelihoods, safety and security etc.?
- To what extent do individual women's transport experiences vary in the pandemic? How are they shaped by social class, marital status, occupation, residential location, gender norms and pre-pandemic access to transport/mobility?
- Has virtual mobility (mobile phones and social networking) presented women users with a viable and expanding substitute/complement to physical mobility during COVID-19?
- What are the possible knock-on impacts for post-COVID lives and what key policy lessons are there for future pandemic scenarios?

Conditions are still evolving on the ground, as the pandemic changes shape and governments try to respond not only to health and economic threats but also to associated political vulnerabilities that have surfaced. Below, reflections are offered on the first 4 questions, with a principal focus on impacts on women's well-being. Potential policy lessons (addressing the 5th question) are discussed in section 9.

8. Reflections on the research questions

8.1. Project-specific issues: the relevance of data gathered prior to lockdown for designing planned pilot interventions

Observations in the project sites indicate that many conditions that prevailed pre-pandemic still characterise the low-income study locations: transport operations remain male-dominated, young women's resource access and opportunities continue to lag behind most men's, and sexual harassment concerns remain widespread. Women also still pay for safer transport if they can afford it (though expanded resource constraints mean that walking is the only option for many, despite security concerns). Consequently, the skills training that was planned pre-pandemic remains relevant, though the programmes are having to be adapted to fit online presentation or delayed until conditions permit face-to-face engagement.

8.2. What are the knock-on impacts on women's well-being in the study sites

Despite the diverse contexts of the focus cities, some common themes have emerged:

8.2.1. The impact of rising costs of travel and reduced services

This has been particularly substantial for women in low-income urban peripheries, given their more limited access to personal vehicles and financial resources. Many women are still forced to travel, whatever the legality of such movement, because they must obtain food, drinking water, income, healthcare, or travel to care for others. As noted earlier, self-isolation is a privilege of the rich. Organized remote working is available to only those privileged few with jobs in the formal sector that can be conducted remotely and have adequate access to devices and connectivity to enable this. Given such constraints, some women have reported an increase in travel on foot, despite attendant difficulties (security concerns, load-carrying, time costs), due to rising transport fares and/or reductions in vehicle capacity/availability. Fear of

contracting coronavirus on public transport adds a further deterrent.

Price hikes, especially in informal sector transport fares, are reported in all three cities (though in Tunis, the government has made formal public transport free to essential workers with appropriate papers during lockdowns). Nigeria's intra-city transport fares increased by, at minimum, 10 per cent between January and June 2020: in Abuja bus fares rose up to 50%, and some informal transport by over 100% following the first lockdown in March2, 020.[6] The Association of Private Transport Company Owners of Nigeria (APTCON) threatened fare rises of up to 500%, following a new law (October 2020) regarding social distancing in buses (7 passengers maximum in a 14 seater bus, 28 passengers in a 50 seater bus).[7] In South Africa, where taxi loading capacity was reduced by government decree to 70% early in the pandemic, and sanitiser supply to passengers required, there has been a series of engagements between government and the various taxi associations regarding taxi fare increases.[8] Meanwhile, ride-hailing companies cut their prices (Bolt, for instance, offered past Cape Town customers 10% off their next 10 trips in April 2020, 40% in July, then 50% in December). But even these rates are usually well beyond the budget of low-income women, especially in the current economic downturn.

8.2.2. Food supply

This tends to be a particular concern for women, whatever their socio-economic status, since they are commonly the main household provisioners. In low income neighbourhoods the pressures are especially great as mobility constraints and rising costs bite hard.[9] As one young Abuja woman emphasised, 'The man is the head of the family, but I am the manager, I will not lie to you it is extremely tough'. City food supplies from rural areas rapidly reduced in volume following state and local government transport regulations.[10] Within cities, marketplaces and shopping malls have commonly been closed whenever infections rise, to reduce disease spread, requiring women to search for food well beyond their normal place of purchase. With constraints on their own income-earning capacity, and limited home storage space for food, most can only afford to purchase small quantities on a daily basis. Long walks in search of food (including when lockdown makes this illegal) are regularly part of the 'new normal': once a food outlet is sourced women struggle to access sellers surrounded by customers keen to buy, or face lengthy queues (as reported in South Africa's shopping malls[11]), prior to another long walk home. Maintaining physical distancing is extremely difficult in such situations.

Of even greater concern in low income areas is ***access to water,*** given the crucial importance of regular hand-washing to disease containment. In low-income neighbourhoods pipe-borne water supply is often poor and broken pipes are even less likely to be mended during lockdowns.

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[6] see https://www.dataphyte.com/economy/transport-fare-increase-amidst-economic-decline/citing Nigeria's Transport Fare Watch, June 2020. Last accessed 8/02/2021.

[7] https://guardian.ng/news/transporters-plan-500-fares-hike-over-multiple-taxation/, last accessed 08/02/2021.

[8] https://www.thesouthafrican.com/news/how-much-to-pay-for-taxi-fare-increase-1-july-2020/last accessed 10/02/2021.

[9] For early-pandemic South African reports of extreme poverty and hunger see, for instance, https://www.wits.ac.za/covid19/covid19-news/latest/covid-19-women-are-bearing-more-costs-and-receiving-fewer-benefits.html last accessed 17/05/2021; https://mg.co.za/coronavirus-essentials/2020-07-15-three-million-jobs-lost-and-hunger-surging-amid-covid-19-crisis-survey/last accessed 17/05/2021; https://www.dailymaverick.co.za/article/2020-07-15-the-day-the-bottom-fell-out-of-south-africa-a-triple-pandemic-has-hit-us/last accessed 17/05/2021.

[10] Interstate government food movements in Nigeria remained legal but were reportedly slowed down by corruption and harassment by security forces.

[11] In South Africa the unregistered Spaza shops and street vendors sell (lower quality) food in small portions; their closure early in the pandemic was a major blow for low-income residents unable to afford to buy from supermarkets.

Women have to search for a working tap, then queue or fight. In Cape Town, the massive inequalities that characterise the city have become even more strongly in evidence as women living in the townships struggle daily to source food and water. The crowding of people (mostly women and children) around public taps and the disease risk associated with water shortage have been highly publicised for South African townships but similar dangers prevail across many low-income areas in Africa. In Abuja, pre-COVID-19 interviews show that diverse coping strategies were already necessary to address water supply limitations (Abubakar 2018); maintaining these sources during lockdowns has put substantial pressure on women in poor households.

8.2.3. Maintaining a livelihood

Livelihoods have become even more precarious than normal in COVID times, especially for women resident in the low-income study neighbourhoods. In these locations, pre-COVID, mobility was essential for most such women. During COVID, their search for income has become an important factor promoting even greater mobility efforts: in desperation, poor women walk long distances looking for any opportunity that will help them survive the escalating costs of living. For those fortunate to keep their jobs, getting to work has become an even more significant challenge than before the pandemic, especially for women in Cape Town townships, where jobs are often located in distant neighbourhoods and require use of multiple transport modes. Ongoing mobility constraints and economic slow-down add further pressure in work such as petty trade. Trading, a common female occupation in all three study cities, has been severely curtailed by lockdown restrictions and social-distancing measures that force market closures. Traders at other usually profitable vending areas (such as taxi ranks and bus terminals in Cape Town) have been moved on by the police. All of this necessitates extended time and effort finding business. At the same time there has been an increase in threats of police and military violence associated with lockdown restrictions/curfews and wider insecurity and criminality that has accompanied deepening poverty.

These issues generate a level of emotional and economic stress/fear that inevitably reduces health and work potential. Reflections from Tunis early in the first lockdown demonstrated the way that women's travel, always shaped to some degree by fears of harassment, became over-ridden by even stronger fears of contagion: '*I was scared of the virus particularly when I took bus (to work). I used to be feeling bad because of harassment, but now the virus is more threatening than harassment ..... I started using collective taxi or private taxi because they are safer than bus ...*' (woman in her 20s, 27.3.20). In Abuja, even with market closures at their height, women were still observed going to central areas with goods because petty trade is a vital income source. Given the shortage of motorised transport (due to reduced vehicle passenger capacity) and informal transport fare increases, most walk with their loads: '*I have to walk 12 km to and from work today just to fend for my family. This lockdown imposed on public transport is not fair at all, we can't stay hungry at home, we have to feed our children .....The men don't really care – all they worry about is their social life that is hindered. I can't stay at home*' (middle-aged stallholder, April 2020). Continuing with trade when there is an official ban inevitably brings harassment by security officials: fear of arrest is palpable among the women who scurry to sell their wares as fast as possible: '*I have to be very watchful of the taskforce as (I) am selling before they will come and throw away my tomato. Oga (boss), give me the money fast so we don't waste time*' (young female tomato trader, April 2020).

In Cape Town townships, where fear of violence has long been a constant, significantly shaping women's routes and transport choices, lockdown exigencies have brought further stress. Walking was regularly observed as a major danger on quiet streets in pre-pandemic interviews but risks of early morning walks to taxi ranks increase in lockdown, as women must travel even earlier to the shopping malls to avoid food queues. Women resident in the townships have expressed particular fear regarding travel in the informal taxis (amaphela) that form the main transport mode: these drivers reportedly often ignored the 70%

passenger rule that applied early in the pandemic.[12] Their attitude is unsurprising given the low revenues that accrue to informal transport in this highly competitive, unregulated system. Women observing these risks said they are afraid to voice their concerns. In all three study cities diarists report women being far more vigilant than men about observing public transport travel rules and wearing masks on public transport (mirroring reports from Spain, see De la Vega et al., 2020).

For those (relatively few) women working in the transport sector, conditions are at least equally taxing. Most are in low-paid insecure jobs, especially those operating in the informal sector, but for everyone there is even greater insecurity than in pre-pandemic times (mirroring findings from the small survey of 30 women working in transport conducted in Nairobi by the Flone Initiative). Taxi drivers have faced many constraints with the application of COVID-19 transport regulations and increased operational costs (reduced passenger numbers; sanitiser purchase; bribes to authorities when rules are flouted; high cost and unavailability of spare parts, often imported from China). In Abuja this forced members of the Female Drivers Association in the city to withdraw from business entirely for a time. In Cape Town townships, where school transport contracts had become a key niche for some women, closure of schools during lockdowns severely impacted their businesses. Even when schooling for learners has resumed, reductions in vehicle capacity and expenditure on sanitiser are required. In Abuja, as a woman bus conductor who was furloughed observed: '*We need food. You know children ... when they are hungry they do not go to the father, it is to the mother they go.*'

The high emotional stress associated with fear of contracting the disease has been particularly evident among women who are formal sector transport workers. This is unsurprising and justifiable, given that public transport is a key vector of contagion, at hubs and within vehicles, and many women are at particular risk in customer-facing and cleaning roles. Reports from Cape Town note the angst of women transport employees classified as 'essential workers', who have to balance income against the risk of infection. Furthermore, women's emotional stresses of risk at work combine with massively expanded household demands (obtaining food, caring for the sick, childcare, supervising schoolwork, etc.).

8.3. Comparisons with women resident elsewhere in the case cities

So far, this review of mobility-related impacts has concentrated attention on the low-income areas that form the project focus. However, wider evidence from key informants points to important differences between women according to social class/occupation and associated residential location. Women resident in higher income areas are far more likely to own a car, have funds to pay for taxis (as opposed to travelling on public transport), have a job that allows home-working, a working piped water supply and food storage capacity at home. These factors tend to provide them with a buffer from pandemic-related constraints and dangers. Food provisioning, for instance, though commonly a woman's task whatever her status, is less stressful if funds and home storage capacity enable bulk purchases at (more expensive) local grocery stores.

Nevertheless, even in higher income areas patriarchal attitudes commonly shape women's mobility potential, as noted earlier with reference to Gender Based Violence. There is only a small amount of confidential material on GBV in the project sites, but it is possible to surmise the likely scale of problems from the high density conditions that prevail in the study sites and wider newspaper reportage. In Tunis a new refuge for women was set up by Tunisia's Ministry of Women, Family, Children and Elderly Affairs in April 2020; in South Africa the number of GBV distress calls increased from 12, 000 in week one of the

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[12] This restriction on local taxi passenger occupancy rates was subsequently revoked [12th July 2020].

first lockdown to almost 80,000 by week three (Hofman and Madhi 2020).

8.4. Impacts of virtual mobility during the pandemic

There is a growing literature concerning the role of mobile phones in pandemic medical contexts (e.g. case reporting), but detailed studies on the impact of mobile phones on social connectivity are yet to emerge. As noted earlier, poor internet access in low-income neighbourhoods limits the potential for home-working[13]; by contrast, basic mobile phone access is ubiquitous. Uptake of virtual mobility as a complement to physical mobility has been building for some time in Africa but has become ever more crucial with constraints on physical mobility. Interactions across all three cities are now heavily dependent on mobile phone use - particularly WhatsApp - not merely for disseminating information, but as a focus of social interactions and expressions of care and solidarity. Many women's diary entries demonstrate this, for instance:

My phone started ringing. It was XXX, my sister. She said she had lost her sense of smell. She sounded very nervous especially because she has children. I ….then called a friend of mine who works as a nurse [and] explained her about my sister's condition. She said, 'I work the evening shift and XXX must go to the emergency room immediately. [Tunis, 7/11/2020]

One of [my] colleagues, XXX, he is sick and he has not been coming to work since on Wednesday, and his phone is switched off. Each and every one of us have been trying to reach him and none of us knew where he stays, though our boss [has said he will call a local contact who] … will check on him and give us feedback [Abuja, 25/7/2020]

Most project evidence regarding mobile phone usage comes from female diarists, but the few contributing male diarists suggest that they also depend heavily on mobile connectivity for emotional support. Further investigation with male respondents would be valuable.

9. Looking to the future: policy implications

With the promise of vaccinations now on the horizon (first vaccine arrivals in South Africa, February 2021; in Nigeria and Tunisia, March 2021) this is an appropriate time to reflect on lessons to date regarding women's transport and mobility practices. In particular, do the changes that COVID-19 has wrought offer the potential to capture and pursue more positive trajectories for low-income women as transport users and transport sector workers, or can we expect a reversion to past conditions of marginality?

For women living in the low-income locations that are the project focus, it is difficult to predict likely trajectories in either the short- or long-term. Nonetheless, the discussion indicates a number of policy lessons worthy of reflection. The relatively limited impact of COVID-19 in Tunis in the early months of the pandemic, following early imposition of lockdown, suggested that rapid action can be crucial in reducing disease transmission; sadly, once borders were opened (to protect the tourist industry) cases started to increase again, necessitating mask-wearing regulations and a return to curfew.[14]

Once lockdown is imposed, early evidence from Abuja and Cape Town, and more recent evidence from Tunis, shows that governments must more actively prioritise provision of essential goods and services to the poorest (whose ability to cope with stasis is lowest), so they can manage without contravening mobility restrictions. This is likely to require closer working with low-income community leaders and local government to identify key potential gaps in local provisioning and accessible provisioning points where these essential goods (water, basic food sales/distribution) should be located; providing water tankers to serve areas with poor supply; providing basic emergency foods, if local supply is entirely disrupted; developing listings of the most vulnerable (disabled, elderly) residents who may need direct doorstep provision; perhaps marking out priority walking routes to provisioning nodes with variable travel timings to allow safer provisioning of different groups across the day (and enabling people living in cramped conditions some outdoor exercise). Basic income payments to the poorest to buffer the shock of job and income loss are expensive but worth considering if they halt severe distress and the spread of the disease. They may be preferable to provision of food packages as recipients can then decide what food and essential goods they need.

Within the transport sector careful reflection on changing public needs is essential. Some organisations started to work innovatively very early in the pandemic in the study cities. In Tunis, where government is a major player in the transport sector, public transport was made free to essential workers, men and women, when they needed it to get to/from work during lockdown. Fear of contagion continues to inhibit public transport use in Tunis and, with less crowding, one very positive result reported by peer researchers has been some reduction in physical harassment (though not in verbal/visual harassment).[15] This suggests that, with continuing concerns regarding contagion in all three cities, it could be an opportune time for experiments that give women priority access in seating and boarding arrangements. While this would require buy-in from public transport operators, it would be particularly beneficial for women on routes where public transport demand is high, especially in low-income neighbourhoods.

COVID-19 may also have the potential to promote greener transport modes. In Cape Town, despite a few small initiatives to promote women's cycling, this has mostly been an elite activity (Jennings et al., 2017). Now, however, the potential to support cycling in township contexts is generating some small initiatives.[16] These promote cycling to ensure that individuals get to work safely and help limit the disease spread by not using public transportation. While it is unlikely that the UN call for bicycles as a driver of post COVID-19 'green' recovery[17] will have massive uptake among women resident in low income urban neighbourhoods in most African cities (UNEnvironment 2016: Irlam 2016), there may be greater interest in cycling among women as well as men as fear of COVID-19 and other potential pandemics lingers on. In central Tunis, for instance, there are reports of a cycling initiative that has gained momentum among women during COVID-19.[18] This may be a particularly auspicious time for cycle projects focused on girls and women (as well as men) in peripheral areas, where the alternative is to brave public transport or walk long distances.

In diverse countries there is now extensive, encouraging discussion in the wider transport sector regarding the vital importance of improving access to safe Non-Motorised Transport (NMT) modes. This focuses on the need for dedicated cycle paths and wider city pavements, so that people can more safely maintain a safe distance from each other during the pandemic (along the lines of small initiatives to expand

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[13] In South Africa, there has been a major campaign to lower data expenses. See https://dgmt.co.za/zero-rating-mobile-services/last accessed 17/05/2021.

[14] By January 2021 infections were so high that four days of general confinement were imposed, inciting much protest, especially in low income communities like the project study neighbourhoods.

[15] Peden and Kobusingye (2020:17) refer to anecdotal evidence of *increased* sexual harassment of women essential workers on public transport during the pandemic (but without reference to specific cities).

[16] For instance, a cycle shop in Khayelitsha township initiated a 'heroes on bikes' campaign early in the pandemic to provide bicycles to essential service workers as a means of transport (following a similar initiative in UK).

[17] https://www.un.org/en/coronavirus/un-eyes-bicycles-driver-post-covid-19-%E2%80%98green-recovery%E2%80%99 last accessed 17/05/2021.

[18] https://www.albawaba.com/editors-choice/your-bike-tunisian-women-learn-how-ride-bicycles-1366096 last accessed 17/05/2021.

cycling and walking in Addis Ababa, Kigali and Kampala (Dalkmann 2020)), but the potential for greater prioritising of NMT interventions offers a green restart with significant post-pandemic benefits (Tumi 2020: 19).

Two other positive features of lockdowns, across all three cities, are likely to have been some decline in air pollution and possibly also a reduction in traffic injury/fatalities (though with quieter roads there is also more opportunity to speed). However, while both may have provided some health benefits, especially to women petty traders who continue to conduct their business at the roadside, the resumption of pre-pandemic traffic volumes will occur relatively quickly unless green agendas are pursued aggressively. Higher preference for use of any personal vehicle available, in the context of likely health risks of travelling on public transport, is widely in evidence and again privileges the wealthier. Unfortunately, women are far less likely to have access to personal transport than men, and a combination of reduced incomes plus higher transport fares will hit women hardest. There is clear potential for significant knock-on constraints on women's job search, access to education/training, jobs, healthcare (including maternal health) and food intake associated with higher transport fares and increased travel risks given the persistence of over-crowding on informal transport even in the peak of the pandemic. These factors may further reinforce family concerns regarding women's travel. Impacts are particularly likely in the peripheral areas (characterised by long journeys to work and services) and require urgent attention, with measures towards restoring women's trust in public transport and improving its affordability.

As transport operations resurge, given that vaccination roll-outs are likely to be slow in Africa, actively imposing/policing regulatory measures (e.g. mandatory face masks, sanitiser provision, reduced passenger densities) will remain essential. The latter could encourage more women onto buses and trains if less crowding reduces physical harassment opportunities). At the same time, the rent-seeking that often accompanies policing of traffic infringements in African cities means that enforcement will also need adequate prior circulation of regulations to all sectors of the public and careful surveillance of police actions (Blundo et al., 2013). As one Abuja woman expressed this: '*let the transport be back, but let the government put rules and regulations so that people will know what is expected of them.*' Government could also consider transport subsidies, particularly on routes that extend into low income neighbourhoods, and for services that promote measures for physical distancing and women's priority seating and boarding. This would encourage a move back to public transport. Re-examination of regulations governing the informal transport sector may also be appropriate: ironically, the motorcycle-taxi services which have been banned in parts of Abuja (and many other African cities) may offer safer travel than crowded saloon/minibus taxis, if these are limited to carrying one passenger only, since movement takes place in the open air and the passenger sits directly behind the driver. Ongoing trials with perspex screens between driver and passenger in Kampala may further enhance motorcycle-taxi safety during the pandemic.

So far as women's employment in the transport sector is concerned, the research presented here and emerging evidence elsewhere suggests a likely decline in women's job security in the informal sector as competition intensifies (especially given the difficulties of effective government financial support and stimulus packages because of the highly fragmented nature of the informal sector (Dalkmann and Turner 2020)). Perhaps there will be better prospects for women employed in the formal transport sector (where they have started to make small inroads in all three cities), but across transport and other employment sectors, concerted efforts are needed to grow women's participation. Microfinance support and financial management training both look to be key areas where support for women entrepreneurs in the informal sector could bring significant benefit post-pandemic. This could include linking informal enterprises such as women taxi owners and owner-drivers with accountancy companies that can offer sound business advice. Promoting

girls' aspirations to work in the transport sector while they are still in education would be a valuable linked preliminary step: currently, focus groups with teenage girls in all the study sites indicate very negative attitudes to work in this sector.

One other area worthy of careful consideration is the intersection of virtual with physical mobility. Certainly, the mobile phone (particularly WhatsApp), has become an ever more crucial tool during the pandemic, especially among low-income groups, as noted earlier. There is also growing interest in the transport sector regarding the potential for digitizing transport-related payment services to reduce contact (following Nairobi's example). The development of cashless smartcards, ideally enabling an integrated ticketing system that can work across different transport modes is complex (as reported for South Africa by Schalekamp et al., 2017, and for sub-Saharan Africa by Tinka and Behrens, 2019). Nevertheless, efforts at developing systems that are workable in African contexts are likely to grow exponentially given ongoing concerns regarding physical cash handling in disease transmission (Cevik 2020).

Meanwhile, drones offer somewhat more controversial opportunities but are already being utilised in African contexts (Chamola et al., 2020). They have been used for some time to transport medical supplies in rural Africa and have reportedly delivered PPE, coronavirus blood samples and now COVAX vaccines in Ghana.[19] Less positively, could digital/drone surveillance become a standard element of urban mobility control? Drones have been used in China and India for crowd surveillance during the pandemic and the Tunisian Ministry of Health and COVID-19 Task Force was given Chinese drones, equipped with temperature sensors and loud speakers[20]. An unmanned ground vehicle (UGV) was also set up to patrol Tunis streets to help enforce the first lockdown (possibly the first to use UGVs in the COVID-19 crisis).[21] The usage of drones in efforts to police physical distancing has subsequently occurred elsewhere. In Morocco, for instance, the authorities reportedly employed drones to issue warning, identify suspicious movement in the streets and disperse illegal rooftop and balcony gatherings.[22] Even so, could drones be a force for good if drone surveillance enables women's safe early morning travel to work along empty streets? To avoid more negative elements of mobility control, however, this would require careful monitoring by civil society organisations.

10. Summary and conclusions

This study, focused on the everyday mobilities of women and girls in Abuja, Cape Town and Tunis prior to and following the onset of COVID-19, demonstrates the particularly severe impacts experienced by those resident in low income neighbourhoods. The peer research approach, tailored to research with vulnerable groups, drew out the implications of economic contraction, rising costs of travel and reduced transport services for women's access to food, basic services, livelihoods and personal safety. This led to broader reflections regarding likely contrasts with the mobility of better-resourced women; the use of mobile phones as a substitute for physical mobility; and finally to key policy lessons. The latter include an immediate, urgent need to more actively prioritise provision of essential goods and services to the poorest during lockdowns so they can avoid contravening mobility restrictions.

Despite the concerns raised regarding women's mobility futures, the potential for wide-ranging post-lockdown policy revision and

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[19] https://www.theverge.com/2021/3/9/22320965/drone-delivery-vaccine-ghana-zipline-cold-chain-storage last accessed 17/05/2021.

[20] https://africa.cgtn.com/2020/04/26/tunisia-receives-drones-from-china-to-aid-covid-19-fight/last accessed 17/05/2021.

[21] https://ploughshares.ca/2020/04/using-drones-and-ugvs-to-fight-covid-19-but-then-what/last accessed 17/05/2021.

[22] https://africa.cgtn.com/2020/05/07/morocco-launches-fleet-of-drones-to-tackle-virus-from-the-sky/last accessed 17/05/2021.

experimentation is exciting: for instance, promotion of Non-Motorised Transport 'green' interventions such as support to women's cycling; micro-finance support to promote women's participation as transport operators; subsidies to encourage a return to public transport; physical distancing trials on public transport to reduce opportunities for sexual harassment; even usage of drones to aid women's safer pedestrian travel. At the same time, it is necessary to acknowledge that until effective vaccines have been successfully rolled out across a substantial portion of the continent's population, requirements regarding the observation of physical distancing and travel hygiene will constitute factors with remarkably pervasive influence. The repercussions will extend far beyond everyday mobility and public transport, penetrating almost all aspects of women's lives and making progress towards SDG 5 enormously challenging (OECD 2020). Positive interventions to support women's improved access to safe mobility in the everyday will not only require far greater representation of women in key COVID-19 decision-making entities than has tended to be the case (Rajan et al., 2020), but also – in the longer term - far stronger representation in transport decision-making institutions across Africa (Porter, Abane, Lucas 2020). In the context of growing demands for a more just and sustainable world - at the same time that the threat to women's informal employment and earnings is becoming increasingly serious - the central role of stasis, mobility and transport modes and practices in shaping women's everyday lives and life chances has never been more starkly in evidence.

Author statement of interests

Acknowledgements

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