

TRANSPORT FINDINGS

COVID-19 and Modal Shift towards Motorized Two-wheelers in Dhaka, Bangladesh

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Findings

Based on in-depth interviews of 17 key informants in Dhaka, Bangladesh, this paper explores the reasons behind the observed modal shift toward motorized two-wheelers that occurred with the COVID-19 pandemic, along with its implications. Analysis of the key informants' perspectives revealed that individuals' inclination towards motorized two-wheelers occurs because of maintaining physical distance, lack of walking and bicycling infrastructure, the high social status associated with motorized two-wheelers, and brand promotion. The implications of this modal shift include increased traffic congestion, GHG emission, and traffic incidents. As interviewees suggest, mass communication, understanding users' perspectives, and promoting equity concepts are needed for a modal shift towards more sustainable options.

1. Questions

Despite government mandates and protocols, maintaining recommended physical distancing is very difficult in a densely populated country like Bangladesh (Jamal, Chowdhury, and Newbold 2022). Given the worldwide spread of COVID-19, there is an expectation that a modal shift towards individual means of transportation such as private cars, motorized two-wheelers, bicycles, and walking will occur (Abdullah et al. 2021; Dingil and Esztergár-Kiss 2021; Thombre and Agarwal 2021). Since 2014, there has been an increase in the use of motorized two-wheelers—predominantly combustion-powered mopeds and motorcycles in the country due to the launch of motorized two-wheeler-based ride-hailing services (Wadud 2020), with 84% of Bangladesh's listed ride-hailing vehicles using motorized two-wheelers in 2020 (Mithu 2020). From March 2020, the motorized two-wheeler-based ride-hailing service was under complete suspension resulting in a business collapse in this sector during COVID-19 (Antara 2021). Moreover, there was a reduction in overall mobility due to maintaining physical distancing in Bangladesh (Jamal and Paez 2020). Still, a steady increase in the number of motorized two-wheelers during the COVID-19 pandemic is evident. As [Figure 1](#) suggests, the number of motorized two-wheelers increased to 3,500,905 in 2021 from 2,814,637 in 2019 - a 24% increase in two years. These data indicate the possible personal use rather than their use for ride-hailing business.

Also, in Dhaka, the capital city, an increased interest in purchasing motorized two-wheelers for personal use was observed during the first pandemic wave in 2020 (Zafri et al. 2021). However, the underlying reasons behind this modal shift, along with the implications of this shift, are inadequately understood.

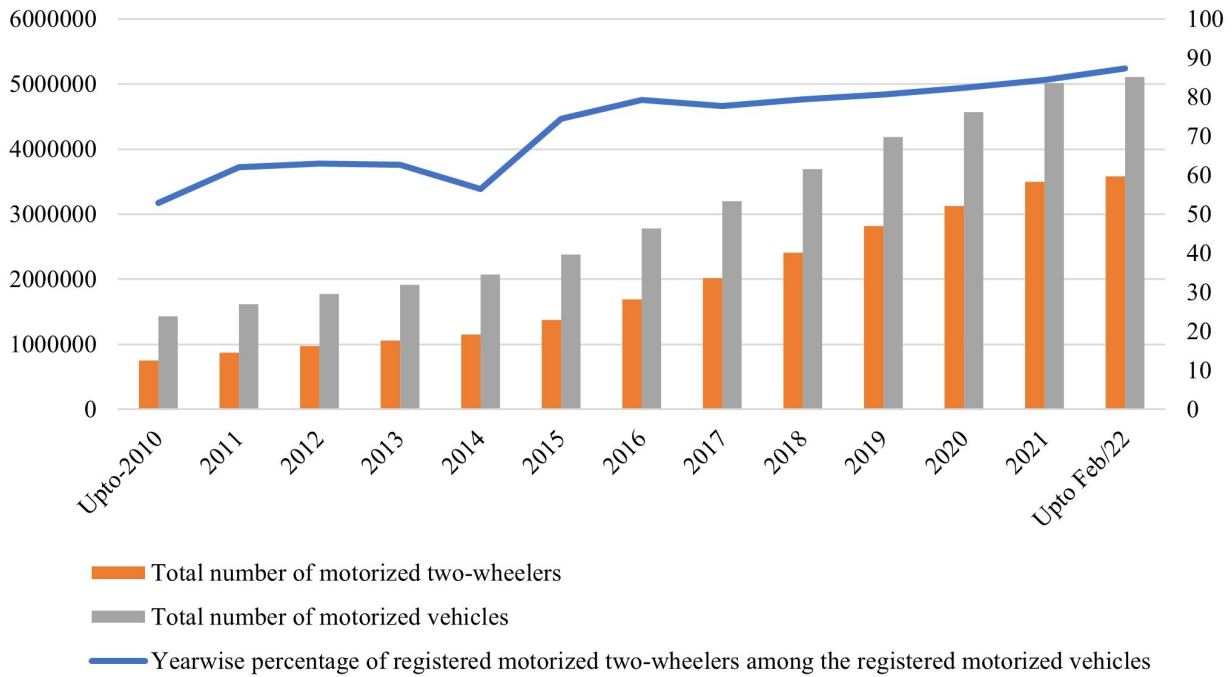


Figure 1. Total number of vehicles versus motorized two-wheelers and yearwise percentage of motorized two-wheelers among the registered motor vehicles in Bangladesh (Source: BRTA 2022)

Based on key informant perspectives, this paper explores why COVID-19 has possibly caused an increased interest in using motorized two-wheelers for personal use in Dhaka, along with the challenges that the city will face for this unanticipated uptake of motorized two-wheelers.

2. Methods

Seventeen in-depth semi-structured interviews were conducted with key informants, including seven with public health officials and ten with experts in urban planning and transportation in Bangladesh (Table 1). Recruitment relied on the contact lists of different academic and research institutions, non-profits agencies, government, and health research organizations, and 4 participants were recruited through snowball sampling. Recruitment and interviews took place from July to October 2020. Interviewees were asked to share their thoughts on how the pandemic and public perception have impacted modal shift and what that shift means for Dhaka’s transport sector. The current paper discusses the findings relevant to the modal shift towards personal motorized two-wheelers and their implications.

All interviews were conducted in Bengali (native language) and translated into English by the researchers. We conducted a thematic analysis of the data following a deductive approach to summarize key informants’ perceptions on potential reasons behind the modal shift and their implications. We used the Rigorous and Accelerated Data Reduction (RADaR) technique (Watkins 2017) to analyze the qualitative data with the first two authors (native Bengali speakers) generating the codes separately. All authors created the themes based

Table 1. Description of the participants of the in-depth interviews

Participant ID	Specialized sector	Years of Experience
Health Professionals		
H1	Public Health Researcher (area of expertise: infectious disease)	13
H2	Practicing Medical Doctor and Health Researcher	15
H3	Health Economist	20
H4	Epidemiologist	23
H5	Public Health Researcher and Policy Analyst	12
H6	Health Researcher and Social Scientist	15
H7	Public Health Policy Analyst	16
Transport/ Urban Planning Professionals		
TU1	Architect and Urban Planner	30
TU2	Sustainable Transport Advocate, NGO	14
TU3	Environmental Advocate, NGO	18
TU4	Transport Planning Researcher	18
TU5	Academic: Transport Planning	17
TU6	Academic: Urban Planning	16
TU7	Traffic Engineer and Accident Researcher	08
TU8	Urban Planner	19
TU9	Academic: Transport Planning	22
TU10	Transportation Expert/Consultant	34

on interrelated codes. Readers can refer to Jamal, Chowdhury, and Newbold (2022) for additional detail on the application of RADaR technique in the context of Bangladesh.

3. Findings

The thematic analysis revealed that key informants identified four main reasons for the modal shift to motorized two-wheelers (Table A1). First, all participants noted health concerns and risk of infection, including the difficulty of maintaining physical distancing and the cleanliness of surfaces when using public modes of transportation such as buses, paratransit, and ride-hailing services. According to them, hygiene concerns increased interest in or use of private transport modes, including motorized two-wheelers.

Second, while reflecting on the possible use of active travel modes such as bicycles and walking, most interviewees (e.g., 5/7 health professionals and 9/10 transportation/ urban planning professionals) were not confident about a modal shift toward either of these during COVID-19. They stated that a lack of appropriate infrastructure for biking and walking (including crowded streets), cultural reluctance and the stigma of low social status associated with walking and bicycling in Bangladesh, the difficulty of wearing personal protective equipment (for COVID-19) in Bangladesh’s hot and humid weather, and the physical labor involved in active travel discourages individuals from walking or bicycling. Also, due to restrictions of non-motorized vehicles in many of the major roads of Dhaka, motorized two-wheelers are preferred as

a private mode for higher accessibility and connectivity. Thus, users are more likely to consider motorized two-wheelers as a suitable and preferred travel mode even during the pandemic.

Third, social context is also partially responsible for the popularity of motorized two-wheelers, with key informants, mostly transportation/urban planning experts highlighting the active roles played by manufacturers to make motorized two-wheelers more popular in the country. While not widely affordable, those who can afford them will switch to motorized two-wheelers instead of walking and bicycling, given the concerns and barriers noted above. Public transport is also not an option given concerns with COVID-19 transmission risks. Experts, mostly the transportation/ urban planning experts noted that the manufacturers have already identified their target group – middle-income and higher middle-income groups. To set the context, middle and higher middle-income groups represent approximately 50% of the population in the city (PPRC 2016). Further, interviewees mentioned that during the pandemic, manufacturers and financial organizations offered financial schemes such as zero down payment, low monthly installments, 0% interest, and financial support to cover a certain percentage of the vehicle registration and licensing costs associated with motorized two-wheelers that are not available in the country to buy bicycles.

Fourth, interviewees also highlighted the role of gender in mode choice. Women in Bangladesh often experience physical and sexual harassment while using public transport. Because of this, interviewees noted that many women have started to use personal modes, especially motorized two-wheelers, to avoid harassment – something the manufacturers are currently focusing on their brand promotions, along with the ability to maintain physical distance during COVID-19, time-saving, and the convenience motorized two-wheelers offer.

However, there are risks and challenges in the case of increased use of motorized two-wheelers. Interviewees highlighted two interconnected challenges if a substantial shift towards personal use of motorized two-wheelers continues. First, an increasing number of drivers will likely increase the risk of collisions and injuries. Twenty-seven percent of deaths in traffic collisions in 2017 involved motorized two-wheeler users (The Daily Star 2018), and the rate of motorized two-wheeler-related crashes went from 19% to 27% between 2019 and 2020 (The Daily Star 2021). Interviewees added that many riders have not been adequately trained and do not know how to drive a motorized two-wheeler, contributing to increased risk of collisions. Some of the interviewees pointed out the cost of licensing and the complexities of the licensing process faced by the public, resulting in many riding without a license. Consequently, the increased number of motorized two-wheelers with untrained riders will increase the likelihood of motorized two-wheelers-related crashes and injuries. Second, the increased number and use of motorized two-wheelers will likely contribute to increased GHG emissions, pollution, and traffic congestion.

Policymakers should be cautious about the increasing tendency to use motorized two-wheelers. There is a need to work on strategies to discourage motorized two-wheelers and provide suitable, safe, sustainable, and affordable transportation alternatives. As suggested by the key informants, mass communication to raise awareness involving both academia and policymakers, understanding users' perspectives at the decision-making level, and promoting equity concepts within the society are needed to change the mindset of the people towards sustainable transportation.

Finally, it should be noted that in developing country contexts, key informants/ subject matter experts may lack knowledge or not be familiar with the conditions in the field. Therefore, their knowledge might not translate well in the real world (Kumar 1989). Their views may reflect their preconceived notions or abstract ideas or their own perceptions rather than the lived experiences of the general public as often they belong to different socioeconomic strata than the population they are describing or working for (Kumar 1989). Therefore, the findings of the key informant interviews should be interpreted carefully and should act as a basis for hypothesis formulation.

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Appendix

Table A1. Key themes and relevant quotes

Key themes (N*, H**, TU**)	Example Quotes
Reasons behind the uptake of motorized two-wheelers from the key informant perspectives	
<ul style="list-style-type: none"> Health concerns and risk of infection (N=17, H=7, TU=10) 	<p><i>"Although the government has instructed bus operators to follow health guidelines such as keeping hand sanitizers [on board], and specified the maximum number of passengers to be carried [to maintain distance], due to higher demand of the public transport, especially the transit and paratransit services, most of the time, the guidelines can't be followed, which increases the COVID - 19 transmission risks...personal protective measures can only be expected to be effective."- TU4.</i></p> <p><i>"I was involved in a few studies on the hygiene practice of the public [in Bangladesh]. We have seen that covering the face with hands while sneezing and coughing is very common in Bangladesh, and almost in every case, people don't clean/ wash their hands after that. They transfer the germs on every surface they touch after sneezing and coughing." - H6.</i></p> <p><i>"People, in general, tend to hide their disease. On the other hand, no safety measures are taken properly in the public transport sector" - TU2.</i></p> <p><i>"... driver's and previous passengers' personal hygiene is questionable as you cannot be sure of it. The virus could be in seats, doors, handles and if the driver doesn't clean it properly, there could be a risk."- H4</i></p> <p><i>"...I can't control the overall hygiene and disinfection level of transit or paratransit [modes]...but in private modes, everything is under my control." - TU8</i></p> <p><i>"From planning, energy security and sustainability perspectives, we don't encourage motorized two-wheelers, but yes, considering the pandemic situation and current state of Bangladesh's infrastructure, I would say that at this moment, motorized two-wheelers could be an appropriate, more of a practical mode of transport to those who can afford it." - TU4.</i></p> <p><i>"Transmission risk is low while using motorized two-wheelers because of the helmets." - H4</i></p>
<ul style="list-style-type: none"> Modal shift towards motorized two-wheelers instead of walking and bicycling (N=14, H=5, TU=9) 	<p><i>"... people are trying to avoid public transport...looking into the street, it looks like purchasing of private modes, especially motorized two-wheelers have increased due to necessity." - H7</i></p> <p><i>"The demand for transport has increased because of the reduced frequency of the public transport [in the post lockdown period]. I am saying this based on my observation...many young people have bought motorized two-wheelers..." - TU5</i></p> <p><i>"While non-motorized travel is encouraged in other countries, [here in Bangladesh] we are banning the use of non-motorized transport modes in major roads...instead of non-motorized modes; people use motorized two-wheelers for greater connectivity and accessibility" - TU2</i></p> <p><i>"People use motorized two-wheelers for accessibility and greater connectivity to different locations." - TU5</i></p> <p><i>"...speed, time-saving, the potentiality of social distancing, and available maintenance services within reach are the main reasons for increased use of motorized two-wheelers [during the pandemic]." - TU9</i></p> <p><i>"Weather is scorching and humid in Bangladesh...not suitable for bicycling." - H4</i></p> <p><i>"In summer, it is hot and humid [in Bangladesh]; in the rainy season, it rains; in winter, there is dust everywhere - all these make walking and bicycling almost impossible..." - H7.</i></p> <p><i>"... bicycling is not feasible because of [lack of] infrastructure and [high level of] air pollution in Dhaka." - TU2</i></p> <p><i>"It is not possible to maintain the recommended 6 feet physical distance in the walkways of Dhaka as too many people walk there." - TU5.</i></p> <p><i>"Walking is not safe in Dhaka's walkways. Too many people are walking there and not wearing masks... You have a chance to get touched by another person, and you don't know whether that person is maintaining hygiene or COVID - 19 positive." - H3</i></p> <p><i>"Motorized two-wheelers are becoming popular as our major corridors are not at all suitable for bicycling, and there is no proper well-maintained infrastructure for walking." - TU5</i></p> <p><i>"There is also a cultural context behind the increased use of motorized two-wheelers in the country. Our society is a hierarchical society...bicycling and walking are not within our culture. People [in Bangladesh] don't use active modes and buses, considering their social status." - H5</i></p> <p><i>"Motorized two-wheelers use is a status issue in this country...non-motorized transport is considered a low-</i></p>

Key themes (N*, H**, TU**)	Example Quotes
	<p><i>status mode...</i> – TU6</p> <p><i>“...bicycling is not within our culture. There is a social barrier or, let’s say, a stigma associated with using active modes of transport... Transport mode is a social status issue. That’s why whether they can afford it or not, private motorized vehicles are always preferred here.”</i> – H7</p>
<ul style="list-style-type: none"> Social context and role of the manufacturers of motorized two-wheelers (N=10, H=2, TU=8) 	<p><i>“...young generation is more attracted towards it [motorized two-wheelers] because of craze, speed, brand promotion [focusing on young adults].”</i> – TU6</p> <p><i>“Affordability is still an issue for many among those who want to use motorized two-wheelers. It is mostly the middle or high-middle income group who the manufacturers target as they are the ones who can afford motorized two-wheelers.”</i> – H1</p> <p><i>“It [motorized two-wheelers] is unaffordable to the low and low-middle income group...current economic strains such as job insecurity, job loss and income cut have restrained them from purchasing motorized two-wheelers.”</i> -H2</p> <p><i>“In terms of affordability, people can get a loan from the financial institutes to buy a motorized two-wheeler, but a low or low-middle income can’t get a loan to buy a bicycle.”</i> – TU6</p> <p><i>“...manufacturers’ main target group is middle and higher-middle income groups.”</i> – TU8</p> <p><i>“...societal and media focus on using motorized transport are making the middle and high middle income to prefer motorized two-wheelers over cars”</i> – TU6</p> <p><i>“Manufacturers are focusing on the faster mobility while promoting, making young people more attracted towards motorized two-wheelers.”</i> – TU4.</p> <p><i>“If you follow the newspapers, you will see that motorized two-wheeler sale has increased [in Bangladesh]...Along with social distancing, the helmet also gives protection from COVID-19 transmission”</i> – TU2</p>
<ul style="list-style-type: none"> Role of gender in modal shift (N=7, H=3, TU=4) 	<p><i>“Affordability [of perceived safe modes considering virus transmission] is an issue, and there is gender dimension to this as women’s mobility lost is higher compared to men’s in our society...a majority of women may not be comfortable in using personal modes such as motorized two-wheelers and bicycles due to societal views and clothing styles”</i> – H4</p> <p><i>“a change in women’s clothing style is visible in Dhaka ... women are becoming interested in using scooty/ scooters [a form of motorized two-wheelers popular among the women in South Asia] for avoiding harassments in public transports.”</i> – TU1</p> <p><i>“... the focus [in brand promotion] is not only given on the physical distancing but also on that they [women] can avoid [physical and sexual] harassments while using scooty”</i> – H3.</p>
Associated risks and challenges, and policy implications	
<ul style="list-style-type: none"> Risks and challenges of increased use of motorized two-wheelers (N=14, H=6, TU=8) 	<p><i>“Motorized two-wheeler is not safe because of the higher rate of accidents [i.e.collisions and injuries]. There are no separate lanes to ride motorized two-wheelers, and the rate of motorcyclist death in Bangladesh is very alarming”</i> – TU7</p> <p><i>“In most cases, injuries from crashes related to motorized two-wheelers are severe... in most cases, spot-death”</i> – TU2.</p> <p><i>“Riding a motorized two-wheeler requires skill and license, and the licensing process is very complex... Due to lack of law enforcement, many people ride motorized two-wheelers without a license and proper training.”</i> – TU6</p> <p><i>“Motorized two-wheelers should not be encouraged or promoted as a safe mode for COVID-19 transmission because of risk of increasing air pollution, traffic congestion and accidents.”</i> – TU3</p>
<ul style="list-style-type: none"> Need for perspectives and mindset change at both policymaking and user-level (N=14, H=7, TU=7) 	<p><i>“Communication needs to be done through proper channels... communication experts should be employed to understand users’ perspectives and needs.”</i> – H5.</p> <p><i>“Massive public awareness involving media and academia is needed to draw the attention of the policymakers.”</i> – TU1</p> <p><i>“Walking can be promoted/ encouraged during the lockdown. However, should not be encouraged when there is still a risk of covid-19 transmission because of too many people.”</i> – H3</p>

Key themes (N*, H**, TU**)	Example Quotes
	<p><i>“Changing mindset...both at the policymakers level and mass level is needed to reduce the number of motorized two-wheelers in Bangladesh.” – TU6</i></p> <p><i>“if you remove the barriers [of using a transportation mode], then it will be automatically promoted” – TU8</i></p> <p><i>“..... equity concept needs to be induced in our society to change our travel habits towards using active modes....[the context of] behavioural change needs to be included in the policymaking.” – H5</i></p> <p><i>“Perspective matters. Motorized two-wheelers are still considered stylish vehicles... a vehicle for someone with a higher social status. If you want to discourage the use of motorized two-wheelers, these social perspectives need to be changed.” – TU10</i></p>

*N= number of the key informants discussing the theme.

**H = number of health professionals discussing the theme,

***TU = number of transportation/urban planning professionals discussing the theme.