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Research Challenges for Nigerian Road Transportation Sector in Covid-19 Pandemic Era

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Abstract

The COVID-19 pandemic created an enormous disruption to the everyday life of the modern society. Among the various urban systems, transportation services were among those that suffered the most significant impacts, particularly severe in the case of urban transportation and highways. Using the Nigerian experience in the COVID-19 era, it is seen that a lot of city/urban and even rural challenges have to do with coping with peak hour traffic periods when workers have to go to work and student/school children commuting to school, and later return to their homes. With COVID-19 pandemic and social distancing consequences, mass transportation is actually the main barrier for students and workers dependent on transport to go back to their daily routines with comfort and safety. It is implied that the objective of a good research would be to determine a demand control able to equalize the number of passengers in each car but respecting the COVID-19 social distancing protocols with the number of passengers in each time-of-day range being combined into suitable predictive models that include independent variables related to passenger's behavior so that almost 90% of all passengers are follow very strict and straight daily routine that can be coordinated and scheduled creating enough time space one from the other to avoid undesirable concentrations inside buses and bus stops.

Keywords: COVID-19; Pandemic; Transport services; Lockdown; Restriction; Impacting; Social distance protocols; Dynamic changes; Efficiency; Predictive models; Independent variables; Passenger behaviour

Introduction

The growing number of studies on the impact of COVID-19 is often chosen in the context of developed countries, highlighting a gap in the understanding of how the pandemic is impacting developing countries. There is need to acknowledge the effect/impact on transportation in emerging economies where lockdowns and restrictions on movement may not be wholly ineffective but even more suited to the level of psychological response of the people. There is not just poor transportation infrastructure but also lack of a clearly defined transportation system that is effectively managed and regulated by operators while the economy is largely informal. The outbreak of the COVID-19 coronavirus was deemed a pandemic by the World Health Organization (WHO) on 11th March 2020. To date, there have been cases confirmed in at least 203 countries, areas or territories, causing unprecedented measures to be taken by many countries, such as travel restrictions and restrictions on social gatherings. Nigeria is a key regional actor in the African continent with over 200 million people, and it confirmed its first case in Lagos in February 2020.

The emerging economy faces institutional adversity with underlying and persistent economic challenges as it copes with the pandemic and both effect and responses have varied widely in the country. Virtual lives have essentially been instituted for the upper and middle class just like the global situation, more people are working from home. This has reduced travel needs; which before now was essential because inadequate power supply, internet connections and the large informal economy in Nigeria has often meant that people must travel daily to work. The road modal system is the most prevalent and extensively used form of transportation

in Nigeria which grappling with challenges of inadequate fleets of public transport vehicles and dilapidated road networks, makes for significant concerns for the state. The population is growing fast and it has to struggle with the poor infrastructure leading to increased passenger cars and taxis on roads, which cause traffic congestion and gridlocks at peak periods; example, it is estimated the commuters lose up to 75% of their weekly working hours because of traffic congestion in Lagos [1], the busiest and commercial centre of the country.

Nigerian COVID-19 Update & Vulnerability

For situations of emergencies like epidemics, pandemics and any spontaneous or contagious situation, Nigeria is viewed as posing high vulnerability medically because of its large population; the coronavirus disease is one such situation. The dense population of some cities and thin density of facilities has led to overstrained infrastructure. All the 36 states in Nigeria had confirmed cases of COVID-19 but the number of cases and deaths varied with the highest in Lagos followed by Abuja. Earlier in 2021, following relaxation of lockdown measures round the globe, Nigeria also relaxed its tight supervision and it appeared all was getting back to normalcy on the road towards recovery. Currently, the 3rd wave of pandemic due to the Delta variant has hit many countries and figures of infections and isolations (especially from international travellers) have been rising and some panic measures and pronouncements are already being embarked upon, again primarily in Lagos. Overall, there was devastating impact on road transportation especially at the peak and immediate post-peak periods in 2020.

Commercial transportation comprising of Commuter Buses, Taxis, Tricycles also called Keke Napep) and Motorcycles (known as Okadas) comprised the main means of transportation in major Nigerian cities especially commercial hubs and state capitals. These form of transport was already one of the biggest challenges for all municipalities, especially in big metropolitan cities where people are highly concentrated at the same space at the same time before COVID-19 and in fact in some cities like the Federal Capital city of Abuja and most of Lagos, Keke Napeps and Okadas were banned because of the menace they had constituted leading to traffic congestion with high contribution to road accidents and crashes. However, though they were banned to instil organization and sanity, nonetheless they constitute essential commercial transport modes in some parts of state capitals and commercial towns/cities and almost the main transportation mode for Local Government and rural short distance movements. The BRT (Bus Rapid Transit) is a special intervention public road transport mode with a special reserved lane in Lagos while numerous agencies and organizations as well as major businesses and organizations (including construction companies) own staff buses that operate on specified routes to convey workers to and from work. With COVID-19 pandemic and social distancing consequences, proper organizational and logistical frameworks are required now that there is an ease down and workers and public commuters need to resume a measure of movements. It is not clear if commercial transportation unions, municipalities and transport operators have risen to the many challenges of organizing all passenger fluxes to serve all needs and new regulations without losing efficiency and profitability with adequate and acceptable prices for users.

Specific COVID-19 Road Transportation Impacts

Overall COVID-19 pandemic impact on transportation in Nigeria can be evaluated in the context of the developing countries bedevilled by economic and social difficulties that preceded the pandemic; and the experience may suggest a need for new and different policies in the sector. Experience clearly presents practical implications for public and private sector policymakers, as the country navigates this precarious time and charts a new path for individuals and Nigeria. The influence of COVID-19 extended from the economic to the social and religious activities which are the key factors that have confirmed why and how transportation in all highly affected towns and states became disruptive and consequential. The influence of COVID-19 on transportation can be assessed based on the dynamic changes to the commuters' transport demands and relative fare prices during the pandemic, the operators' expected revenue or income structures and the loss in government revenues, which is loss emanating from taxes, tickets and other related government transport income generations sources. At the peak periods, the scale of the global pandemic, as well as the limited social contact and government lockdown restrictions, dictates that research projects requiring fieldwork or sampling be based on convenient procedure as preferred method of gathering data such as gsm, e-mailing, audio phoning and other communication techniques. Convenience sampling procedure involves non-randomised experimentation and relies mainly on individual respondents or groups of respondents that are nearby or easy to reach. Economic activities, social activities and religious activities during COVID-19 were impacted differently by the disrupted transport services due to the pandemic.

Road transportation impact on the economy

As residents could not travel, as usual, a significant impact caused by the pandemic on their economic activities became a major consequence. The informal economic sector is enormous in Nigeria accounting for as much as 65% of the economy in some towns, cities and states. These economic activities include trading, transportation, construction, food preparation, mechanical and electrical work, fashion design and hairdressing, all dependent on travel and some form of road movements to undertake and they require some form of human physical presence. There are those who hawk and sell goods in traffic, operate Uber and other forms of transportation or must travel to provide services who can no longer engage in these activities, thereby impacting negatively on the economy. These businesses are managed by low-income self-employed owners operating in a mostly cash-dominated society; and they must leave their homes daily to earn an income. To these, in addition to lockdown barring free movements, increased cost of

transportation, shortage/lack of transportation mode and traffic congestion have been major impact of COVID-19 on Transportation. The scenario was that there were few fleets of public transport in periods of lockdown with many people wishing to travel. With the demand for transportation being greater than the supply, due to lock down and restriction, the transporters increased their fares. The chain-mail effect is that this high cost of transportation then added to the overall cost of living in towns and cities in particular. Similarly, the cost of food items increased.

Road transportation impact on social and religious activities

Religious activities, which seem such essential part of life, Nigeria being the 6th largest Christian population (87 million) and 5th largest Muslim population (90 million) in the world [2], suffered due to the challenges of COVID-19, especially the social distancing regulation. Regularly, thousands of worshippers travel to different worship centres, and due to the lockdown, this movement was affected. In 2020, the Christian Easter and Muslim Ramadan seasons both fell in the peak COVID-19 lockdown period and many worshippers could not typically travel to places of worship. In a secular sense, religion may be considered a social activity but then disruption in transport services due to the pandemic impacted badly on social and some essential activities like leisure, typical shopping and visits (example to friends and other family members). It may be recalled that at certain periods, partial curfews were required to curb movement. In typical social orientation of many Nigerians, many people like to socialise in the evenings and weekends, visit clubs and attend parties; which the restrictions on transportation impacted. Nigerian collectivistic society habits where there is a fundamental value in a long-term commitment to groups suffered. Many people who wished to check on their friends or volunteer to distribute palliative cares to friends and neighbours were prevented from their practices by restrictions and the lack of transportation impacted upon their desires.

Pandemic Research Challenges on Road Transport Research

Indeed, the Nigerian road transportation sector faced challenges especially on the need to cope with the potential disruption caused by the pandemic and a national lockdown that lasted from 4-6 months. Unfortunately, the provision of road services, and the requirement to ensure the proper operation and maintenance, often goes unnoticed even if disregarded by national authorities because until there is an emergency before fire-brigade interventions and approaches are designed. But we have discussed already that there were strong negative impacts of the pandemic on levels of traffic [3,4]. Strong spontaneous government regulatory response in line with WHO and other global dictations were quite visible primarily to stop spread of coronavirus, cure those infected and get as many vaccinated as possible. But then a large measure of road transportation response was left to the operators essentially characterised by panic reactions to government social distancing and lockdown measures, curfews and sets of related regulations and guidelines. Little road transportation engineering and management, internal business management, and overall economic impact measures may have been in the minds of the operators except complains about the devastating economic effects. Government itself and the transport operators were hardly prepared for such an event and became more focused on prioritising their survival strategies and lobbying for interventions and relief packages. However sustainable engineering approaches and responses must be made to learn and develop schemes that can be applied in case of new waves and future similar events in Nigeria and other emerging economies of Africa and the world. Challenges for public transportation should be viewed in terms of consequences and possible alternatives for the Covid-19 pandemic through strategic precision- application [5].

A lot of city/urban and even rural challenges have to do with coping with peak hour traffic periods when workers have to go to work and student/school children commute to school, and later return to their homes. With COVID-19 pandemic and social distancing consequences, mass transportation became actually the main barrier for students and workers who are all highly dependent on transport to go back to their daily routines with comfort and safety. Thus, the objective of a good research would be to determine a demand control able to equalize the number of passengers in each car, respecting the COVID-19 social distancing protocols. The number of passengers in each time-of-day range should be combined into suitable predictive models that include independent variables related to passenger's behavior indicating that almost 90% of all passengers are following a very strict and straight daily routine that can be coordinated and scheduled creating enough time space one from the other to avoid undesirable concentrations inside buses and bus stops. In a sense therefore, a very accurate urban management tool can arise from the study and may be able to solve not only the pandemic issues but also to improve local public services efficiency, to attract private investments and to improve citizen's quality of life [6,7].

In Nigeria, public transport being exclusively comprised of private bus operators with a measure of regulation by traffic control officers and the police, research needs to be planned by reorganizing daily routines and schedules to move people from their points of origin to their destinations in a real time demand coordination to avoid crowding and time and money losses. Therefore, studies should seek to answer such research queries that: Observe and find any patterns in passengers' daily behaviour; and, determining the main variables responsible for passenger's decision to take public transportation or ride in their own cars, with other modal systems relatively undeveloped. From these preliminary results, the research question would then arise whether it is possible to determine the demand for public transport to organize it so as not to create agglomerations in times of pandemic. Thus, the objective

would be to determine a demand control able to equalize the number of passengers in each car, respecting the COVID-19 social distancing protocols. In the tight options available to commuters in Nigeria, it is possible that many passengers can switch from private cars to public transport to private cars and vice versa and some decisions are likely to cause instability in demand, leading to increasing traffic congestion, pollution and time loss. The Nigerian situation also proves that crowding in public transport systems have implications for the estimation of demand. Rider characteristics must also be considered and included in the model in order to stimulate coordinated supportive policies able to attract passengers to public transport.

Daily information must be collected and collated for the most critical routes susceptible to high traffic, congestion and road crashes/accidents. In terms of research methodology, the number of passengers in each day range time must be combined in different models that include independent variables like time of day, weather conditions, the structure of traffic especially bus and other vehicular type and other binary general variables like school day, pay day and crime; indicating that almost 90% of all passengers follow very strict and straight daily routine, mostly, from their houses up to school and work and back, that can be coordinated and scheduled creating enough time space one from the other to avoid undesirable concentrations inside buses and bus stops due to COVID-19 pandemic [8].

A project that must be adequate to be applied as the study objective will not only be to create a management tool capable to predict demand but also to organize passenger trips, scheduling it according to their daily appointments in order to have buses and other traffic capacity in an optimal usage level for users and operators. This way, the outcome can contribute to a sustainable public transport model and system in the future, respecting not only the number of persons allowed per car but also taking in consideration of other important indicators like fee and gas prices, weather conditions and other alternative transport offers. We must not also lose foresight that the use of gasoline may come to an end sooner than expected, like in 2035, so that we can factor in the place of e-vehicles in our researches [9].

Conclusion

Overall COVID-19 pandemic impact on transportation in Nigeria can be evaluated in the context of the developing countries bedevilled by economic and social difficulties that preceded the pandemic. The unique scenario is that there is overcrowding in urban centres usually likely with unhygienic communal or worksite accommodation and transported to and from the workplace packed in small buses or personal cars, the population presents vulnerable easy target for pandemics, especially the coronavirus. Yet the response, with Nigeria as case-study, has mostly simply been a government magnification of WHO and other countries' suggestions that are spontaneously adhered to by the population without research and modifications to suit peculiar circumstances. In the end, there is hardly any analysis on how to balance economic interests and public health risks, public transport operators being on the receiving end. Indeed, the effect on the disproportionately dominant road transportation sector is devastating, translating to dramatic and devastating chainmail harm on the economy and social activities of the population. But if properly constructed research studies are articulated and conducted, results can be obtained whose outcomes will lead to earlier and faster transportation recoveries and application to solve future situations of similar proportions. Therefore as the current pandemic is being fought to conclusion, it is recommended that our traffic and transportation models be studied and prepared for emergencies, while specific route studies are initiated, convenient pandemic-suitable methodologies identified and schemes worked out for any future situation scale and devastation of the COVID-19 pandemic. The experience may suggest a need to examine the road transportation sector for new and different policies in place of a clueless and nonchalant attention.

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Conflict of Interest

No conflict of interest.

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