Public road transport system and the spread of communicable diseases: Perspectives of operators and passengers in Accra, Ghana

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Abstract

In spite of its role in the development of nations, transport has also been identified as a means of spreading some communicable diseases. However, few studies have been conducted to assess the spread of diseases on road transport. This study sought to explore the views of operators and passengers about the spread of communicable diseases on the public road transport system in Accra, Ghana. Adapting the Disease Transmission Cycle as the conceptual framework, and following a qualitative research method, data for the study were collected through in-depth interviews and observations and were analysed manually based on the emerging themes. Though various diseases were identified to spread on the public road transport system, there were divergent views on the risk of being infected. Meanwhile, respondents indicated they would feel uncomfortable putting up with people suspected to be infected with communicable diseases. The study emphasises strict adherence to internationally acceptable standards on road transport in order to minimize the spread of communicable diseases on public transport in Ghana.

Keywords: communicable diseases, public road transport system, passengers, transport operators.

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Introduction

Transport facilitates socio-economic and political development of every country and can be said to be the live wire of every economy. It is very vital in the lives of any people within any geographical location because it allows different spatial locations to interact effectively (Rodrigue et al., 2006, 2013). The role of transport in the socio-economic development of Ghana cannot be overstated because transport has opened up the country to international markets through which it is able to export its natural resources to generate foreign exchange. Transport has also facilitated the interaction between internal markets where people are able to sell their produce, thereby generating some revenue for their economic well-being. In addition, transport has facilitated social interaction and national cohesion (Abane, 2012).

Indeed, over 95% of internal passenger traffic in Ghana is moved by road transport (Ministry of Transport, 2008) and about 85% of these passengers are carried by public transport (Gbeckor-Kove, 2010). Public transport (in this context means any transport service provided by a third party for commercial purpose) in Ghana, therefore, has helped to meet the transport needs of the greater majority of the citizenry for various economic and social reasons. Relatively, one cannot avoid the use of public transport in Ghana, because most of the citizenry cannot afford acquiring their own private means of transport.

However, transport is also said to be dangerous because it has the potential to cause harm to humans and property (Gubbins, 2003). All forms of transport, be it land, air or water, are associated with some form of risks, which come in various forms and affect people's health. Health issues that are associated with transport can be categorized into three: (1) those arising from road crashes and other transport related accidents; (2) those that arise from emissions and

other pollutants from transport vehicles; and (3) some communicable diseases that could be acquired on the transport system. Using public transport implies mingling with different kinds of people on daily basis which has implications for health and comfort. Transport has generally been identified as a means of spreading communicable diseases (Allen, 2015; Feske et al., 2011; Wilson, 1995). For example, in the 1990s, there were reports of transmission of tuberculosis on some aircraft which led to a collaboration between the International Air Transport Association (IATA), International Civil Aviation Organisation (ICAO) and the World Health Organisation (WHO) to develop a document on best practices in the airline industry in preventing the transmission of communicable diseases (WHO, 1998; 2006; 2008).

There are several ways through which communicable diseases can be transmitted from one person to the other. Whereas some communicable diseases can only be transmitted through sexual intercourse or blood transfusion, others can be transmitted by simply inhaling contaminated air or making physical contact with an infected person. Other means of transmission of communicable diseases include fomites, (that is contaminated beddings, cloths, medical instruments, sanitary equipment etc.). For example, it has been proved that the deadly Ebola virus can be contracted by coming into contact with any bodily fluid of an infected person (World Health Organization, 2014b). On the other hand, some diseases like tuberculosis, common colds, the novel coronavirus disease (COVID-19) and H1N1 are airborne and can be contracted by inhaling the contaminated air or fluids of an infected person through coughing or sneezing (WHO, 2014b).

Meanwhile, it has been observed that most of the vehicles that are used for the movement of people in Ghana were originally meant for movement of goods (Abane, 2009). The absence of

standard specifications for the conversion of these vehicles, or lack of adherence to and enforcement of standards has resulted in vehicles with poorly constructed windows and poor seating capacity and arrangement. This results in poor ventilation and overcrowding in these vehicles, and could aid the spread of communicable diseases. This situation is heightened by the uncleanliness of the interior of some of the vehicles (Abane, 2009, 2012). Besides, people's attitude on public vehicles (i.e. coughing or sneezing without covering the mouth and nose, and also openly spitting while on-board a vehicle) has the potential of aiding the spread of communicable diseases in the road passenger transport sector in Ghana.

Notwithstanding the potential of road transport in the spread of communicable diseases in Ghana, gaps remain in the literature on both the scale of the challenge and preventive measures instituted by transport organisations in addressing this problem. Most of the studies of public health concern in the road transport sector (such as Jorgensen & Abane, 1999; Afukaar, 2001, 2003; Abane, 2012; Amoako-Sakyi, 2013) are related to road crashes. Studies that could document current practices and ways of addressing the issue are urgently needed considering the dreadfulness of recent outbreaks such as cholera and meningitis in Ghana, Ebola in some neighbouring African countries, and the COVID-19 pandemic that has hit the world. This study therefore sought to bridge part of the gap by focusing on potential spread and prevention of communicable diseases in the road passenger transport sector in Ghana, by exploring the perceptions of road transport operators, drivers and users. Specifically, the study sought to explore operators and passengers' awareness of the spread of communicable diseases on public vehicles and in the station environment, assess the risks regarding possible infection of

communicable diseases on public vehicles or at the terminal and explore measures that could be adopted to prevent the spread of communicable diseases on the public road transport system.

Conceptual issues

A communicable disease is defined as an illness that arises from transmission of an infectious agent or its toxic product from an infected person, animal or reservoir to a susceptible host, either directly through an intermediate plant or animal host, vector, or environment (Waithaka, 2007). For a communicable disease to spread, three conditions must be present: there must be an agent, there must be a host, and the environment must be conducive for the spread.

Agent has been described as a microorganism or pathogen that causes infection (Centres for Disease Control and Prevention [CDC], 2006). Examples of agents are viruses, bacteria, parasites, or other microbes. Under normal circumstances, there must be a causative agent present for a disease to occur. This notwithstanding, the presence of that agent alone is not always sufficient to cause a disease, but also there must be a host who is susceptible, and the environment must also be conducive. Other factors, such as the organism's pathogenicity (ability to cause disease) and dose also contribute to an exposure to result in disease (CDC, 2006). On the public road transport systems, agents may be left on surfaces such as seats or door handles (both on the bus and at the terminal) or they may be from droplets through coughing or sneezing.

Host has also been described as the human or animal that is susceptible to be colonised with an infectious agent under natural conditions. There are a variety of factors that are intrinsic to the host, sometimes called risk factors, that can influence an individual's exposure, susceptibility, or response to a causative agent. Behaviours such as sexual practices, hygiene, and other personal

choices as well as by age and sex may often influence the opportunities for exposure to a causative agent (CDC, 2006). Environment refers to external factors that make it conducive for the agent to colonise with the host and multiply. Environmental factors include physical factors such as geology and climate, biologic factors such as insects that transmit the agent, and socioeconomic factors such as crowding, sanitation, and the availability of health services (Rothman, Greenland & Lash, 2008). The enclosed nature of a vehicle and a poorly ventilated waiting bay may contribute to environmental factors.

Infection occurs when a micro-organism invades a susceptible host and causes disease. Infections may range from mild to fatal. Numerous factors determine which organisms and agents are responsible (CDC, 2006), namely: length of time of exposure; manner of exposure; virulence and number of organisms; and state of host defences. Microorganisms come in the form of bacteria, virus or fungi. Examples of common infectious and causative agents are COVID-19, H1N1, Ebola virus disease, cholera and meningitis. The transmission of communicable diseases can be explained with the disease transmission cycle as illustrated in Figure 1

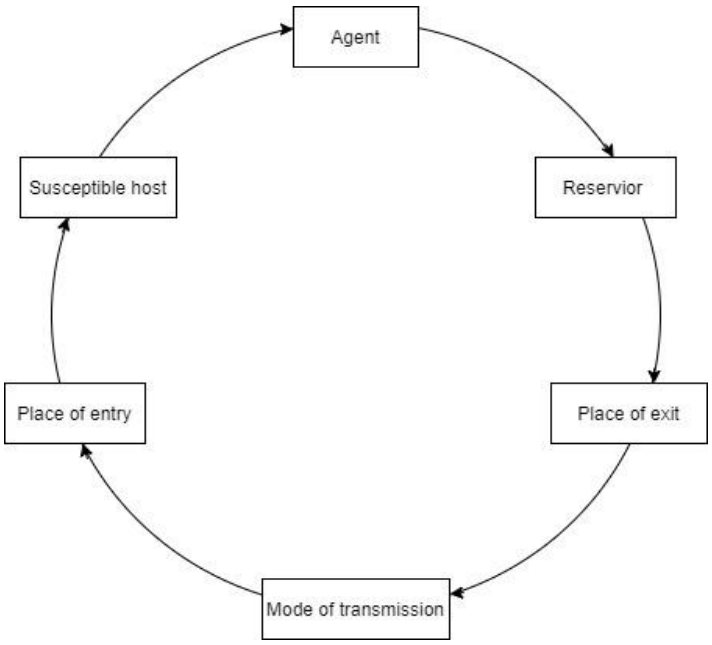

Fig. 1: Disease Transmission Cycle
Source: Centres for Disease Control and Prevention (2006)

The cycle begins with the presence of an infectious agent which resides in a reservoir. A reservoir is the natural habitat of the organism and include human, animals, environmental (soil and water) and inanimate objects. The place of exit from the reservoir is the point of escape for the organism. Examples are respiratory tract, gastro-intestinal, genitourinary, skin, blood and tissue. Mode of transmission refers to how the infectious agent leaves the reservoir and enters the susceptible host. Micro-organisms can be transmitted by four (4) main routes. These are: contact – direct (come into physical contact with host); common vehicle – via inanimate objects such as fomites (towels, beddings, contaminated surfaces, etc.), food and water; airborne and droplets – air or dust (sneezing, coughing, talking, suctioning); and vector – via living creatures (insects, lice, ticks, rats, etc.).

Common vehicle transmission refers to the transmission of disease agents by a common inanimate reservoir (food, drugs, blood) to an individual. Airborne transmission on the other hand refers to the spread of agents by droplet nuclei or dust at a distance of more than one meter from the reservoir to host. Place of entry is the route by which the agent colonizes or enters the susceptible host. It is often similar to place of exit and includes mucus membrane, skin, gastrointestinal tract, respiratory tract, genitourinary tract. Host features that affect the risk of infection include, intact skin and mucus membrane, age, sex, hereditary factors, fatigue, underlying diseases such as diabetes, treatments with antimicrobials, corticosteroids, chemotherapy, stress and lifestyle. The most susceptible clients are elderly patients, infants, immuno-compromised e.g. pregnant women, cancer patients, and people living with HIV/AIDS (PLWHA) (Rothman, 2012).

Generally, preventing the spread of infections require removing one or more of the conditions necessary for transmission of the disease, inhibiting or killing the agent (disinfecting seats and other surfaces on public transport systems), blocking the agents means of getting out from an infected person to a susceptible host (the use of nose mask on a public vehicle), or making sure that people are immune. The point on the disease transmission cycle considered to be the most practical/easiest to break the cycle so as to prevent infections is at the mode of transmission (on the public road transport system, which may include droplets, fomites, or body-to-body contact). For the general public this will include good water, sanitation and hygiene (WASH) practices and adoption of STANDARD precautions such as, good hand washing, cough etiquette/respiratory hygiene, use of personal protective equipment (PPEs), adherence to good house-keeping and waste management practices especially at the terminals.

Materials and Methods

The study focused on road passenger transport organizations in Accra, Ghana. Both public and private transport organisations were considered. Accra was chosen for the study because as the capital of Ghana, it receives and distributes passengers from all parts of the country, both international and national. Accra also has various transport organisations and a variety of transport stations (terminals) (United Nations Human Settlements Programme [UN-HABITAT], 2009). Eight stations, namely Achimota Lorry Terminal, Kaneshie Market Lorry Station, Metro Mass Transit Loading Point at Kaneshie, Intercity STC Coaches Terminal, VIP Jeoun Terminal, Kwame Nkrumah Circle Neoplan Station, Tudu Main Lorry Station and Madina Main Station were purposively selected because they were considered the major places where people converge to embark on, or arrive from long distance journeys.

This study employed the interpretivist research paradigm following the narrative qualitative research design. The narrative design has been found to be suitable for studying people's lives by asking them to provide stories about their lives, which are storied by the researcher (Creswell, 2014). The study adopted this design based on the intent to understand respondents' perspectives on the research topic.

The study population comprised all passenger transport operators in Accra, as well as the passengers who patronised the services of these transport providers. The target population was, however, limited to long-distance passenger transport operators and travellers, because a study by WHO (2008) indicated that people who sat close to an infected person for longer (4-8 hours) of travel were at higher risk of contracting tuberculosis. Although regulatory agencies such as Driver and Vehicle Licensing Authority (DVLA) and National Road Safety Authority (NRSA)

could have been targeted, this study was mainly focused on those stakeholders who were more likely to be victims of spread of communicable diseases in the transport sector.

Table 1 shows the stations that were visited and the distribution of respondents across the stations. In all, 80 respondents were interviewed from eight lorry stations (terminals) all in Accra. All respondents from both the leadership and driver categories were males, whereas 19 out 48 respondents from the passenger category were males and 29 were females. In all, the males constituted 63.7% of the total sample size, whereas the females constituted 36.3%. The modal age group of respondents was 40-49 years and traders constituted the majority of the passenger respondents.

Table 1: Sample Size

No.	Station (Terminal)	Leadership	Drivers	Passengers	Total
1	Intercity STC Coaches Limited	1	3	6	10
2	VIP Jeoun Company	1	3	6	10
3	Achimota Main Terminal	1	3	6	10
4	Kaneshie Market Lorry Station	1	3	6	10
5	Kaneshie Metro Mass Transit Station	1	3	6	10
6	Nkrumah Circle Neoplan Station	1	3	6	10
7	Tudu Main Lorry Station	1	3	6	10
8	Madina Main Lorry Station	1	3	6	10
	Total	8	24	48	80

Three non-probability sampling techniques were employed for the selection of respondents for the study. In the first place, quota sampling was used to determine the number of respondents that were selected from each category. It was envisaged that each station or terminal would have one manager who would be interviewed. It was also projected that three drivers would be interviewed at each station, and for each driver interviewed, two passengers would also be interviewed, bringing the number of passengers interviewed at each station to six. This

projection was used to calculate percentages for the various categories of respondents and because passengers formed the majority, they were allocated 60% of the sample size. The next was the driver category who were allocated 30% of the sample size, and the remaining 10% of the sample size was allocated to the leadership of the various transport organisations. Convenience sampling method was then employed to select the required number of passengers because they were generally transient, and that only those who were willing to participate in the study at the time of data collection were interviewed. The purposive sampling method was used to select respondents from the driver and leadership categories. Thus, drivers and operators who operated long-distance services were purposively selected.

Prior to the data collection, the leadership of the various transport organisations were contacted and the purpose of the study was explained to them. Permission was then sought from them and a date was agreed on for the interviews to be conducted. During the data collection, confirmation for the permission to conduct the interviews was done with the leadership who introduced the researchers to the drivers and the passengers. Before the interviews started, the purpose of the study was once again explained to each respondent, and their informed consent was sought.

Respondents from the leadership category were interviewed in their offices, most of which were located at the terminal. An average of one hour was spent with each respondent in this category. For the driver and passenger respondents, the interviews were conducted at the terminal. Only drivers who were waiting for their turn to load and were willing to participate were interviewed. This strategy was to avoid the situation where the drivers would have divided attention while they were being interviewed. With the passenger respondents, those who were in the waiting bay or on buses that were being loaded and were willing to interact with the researchers were

interviewed. This was to ensure that passenger respondents had enough time for the interviewers. An average of 35 minutes was spent with each respondent in both the driver and passenger categories. Depending on the category of respondents, questions focused on the frequency of use of public transport, years in professional driving, type of buses used and provision of sanitation facilities, knowledge about communicable diseases and how they spread. Other questions also sought their views on the possibility of communicable diseases spreading on the public road transport system and interventions that operators had put in place. A scenario was also created in which respondents were asked how they would react if they were to sit by another passenger who coughed or sneezed indiscriminately without covering the mouth or nose, and the reasons for their possible reaction. Respondents were finally asked to suggest measures that could be put in place to reduce the spread of communicable diseases on the public road transport system. With express consent of the respondents, the interviews were audio recorded, and later transcribed in addition to field notes that were taken to supplement the audio recording.

In order to ensure trustworthiness of the data, the data collection instruments were pre-tested with a sample of 10 respondents, comprising all the categories in a similar study environment in Accra. The results of the pre-test informed the revision of the instruments for consistency and accuracy. Additionally, during the interview section, some of the responses were rephrased and repeated to respondents just to confirm if that was exactly what they intended to put across in their responses. To further ensure rigour of the data, both the transcripts and the analyses were scrutinised by two supervising authors and another faculty member who had expertise in qualitative research. Data from the interviews were transcribed and analysed manually based on the themes.

To complement the data from the interviews, a checklist was prepared to aid observation of the vehicles and the station environment. In the station environment, the state of refuse collection, availability of place of convenience (washrooms) and who owned and operated the washrooms, whether passengers used the washrooms for free or pay for it, cleanliness of the washrooms, availability of soap and running water for hand washing at the washrooms and general cleanliness of the station were observed. These were considered necessary for the study because such environments may facilitate or impede the infection and spread of communicable diseases among passengers, drivers and operators. On the vehicle, the type of vehicles used for operations at the station, capacity, interior cleanliness, arrangement of seats and provision of ventilation were also observed.

Ethical clearance for the study was provided by the Institutional Review Board of the University of Cape Coast, Ghana with clearance ID of UCCIRB/CHLS/2017/19. Subsequently, all ethical protocols were strictly adhered to during the data collection and analysis.

Results of the study

The results of the study cover the general knowledge of communicable diseases and how they spread on the public road transport system, risk perceptions of contracting communicable diseases, attitude towards suspected infected persons on commercial vehicles, and suggestions on possible preventive measures that could be put in place to reduce the spread of communicable diseases on the public road transport system. Some environment issues that were observed at the stations are also reported in this section.

General knowledge of communicable diseases and how they spread on public road transport system

Most respondents described communicable diseases as infectious diseases that were transmitted from one person to another through direct or indirect contact. Others also described it as diseases that could be transmitted through the air. A 59-year-old male passenger said that:

> *A communicable disease is any disease that can be transmitted from one person to another either through direct contact with the infected person or his/her discharges, or by indirect means such as inhaling contaminated air.*

Tuberculosis (TB), Flu, Measles, Hepatitis A, B and C, Cholera, 'Apollo', Chicken pox, Influenza, Common colds, Ringworm, Gonorrhoea, Ebola and HIV/AIDS were the examples of communicable diseases that were mentioned by respondents. They stated that infections like flu could spread from person to person when droplets from cough or a sneeze from the infected person moved through the air and people breathed in the contaminated air. Physical body contact with infected persons could also result in the transmission of diseases like Ebola, Cholera, Measles, and Hepatitis B. Most respondents made mention of having heard of Ebola outbreak in 2015 but a few indicated that they had never heard of an outbreak of communicable diseases in Ghana.

Most respondents in the various categories were of the view that communicable diseases could be transmitted on public road transport systems because of the crowded and dusty nature of stations, and also the fact that there was always close and physical contact with others especially on the vehicles. Thus, when someone comes into contact with an infected person (who is sneezing and coughing indiscriminately) one can easily contract the disease. When asked whether it was possible for communicable diseases to spread on the public road transport system, most respondents answered in affirmative. The response from a 27-year-old driver is illustrative:

> *In the transport environment as I said earlier, tuberculosis for example could be spread on a vehicle. I know TB is airborne and if an infected person coughs into the environment, it will contaminate the air in the vehicle and if another person breathes in that air, he can also acquire TB. Dirty environment, both at the station and on the vehicle can also lead to the spread of such diseases*

This assertion was corroborated by a 45-year-old male passenger who indicated that he had been using public transport for a long time and believed that several diseases could be transmitted through the public transport system:

> *If you consider the way the station environment is, and the way sometimes the place is overcrowded with people and luggage, it is very possible that in the event of an outbreak of a communicable disease, the transport system could facilitate the spread of such a disease.*

Only a few respondents (7 out of 80) did not believe that communicable diseases could be spread on public road transport systems. Their main reason was that they had had previous experiences of boarding commercial/public transport vehicles with persons suspected to be infected with communicable diseases, but they (respondents) did not contract the disease. A 35-year-old male passenger respondent said:

> *I have sat on the same seat with people who cough or sneeze on several occasions, but I have never contracted any disease as far as I can remember. In my view therefore, I don't believe such communicable diseases can be transmitted on a public vehicle, let alone the station which is open.*

Risk perceptions of contracting communicable diseases

To ascertain personal risk perceptions of contracting communicable diseases through public transport, respondents were asked to indicate if they envisaged themselves contracting such diseases. Respondents from only three lorry stations believed that they were not at risk of contracting communicable diseases due to the hygienic and neat/clean environments and the vehicles. This view was expressed by a 49-year-old transport manager at one of the stations as follows:

> *As you can see, the floor of our terminal is concrete with good and hygienic waiting place for the passengers. We also have adequate washrooms with soap and running water for hand washing for our passengers. Food sold here is also done under hygienic conditions and we have put in place adequate waste management facilities. I do not think it is risky working under such hygienic conditions.*

Meanwhile, most respondents from other stations believed that they were at a very high risk of contracting communicable diseases. They cited poor sanitation, contaminated air, dusty environment, and overcrowding leading to contact with infected persons as well as food and water contamination as factors that could put them and others at risk at these stations. A 36-year-old female passenger expressed her view as follows:

> *As we use public transport, we always come into contact with people from different background who behave in diverse ways. One might not know when one contracts a disease in public places such as the vehicle environment, and this is what makes it risky. Some of the symptoms of these diseases take time to manifest, and by the time they do, it might be too late for prevention.*

However, some respondents also believe that very hygienic compound with well-structured wash rooms at transport terminals could help reduce or even prevent the spread of communicable diseases.

Attitudes towards suspected infected persons on commercial vehicles.

Respondents were asked to indicate how they would behave towards any person they perceived to be infected with a communicable disease. All respondents mentioned that they would somehow feel uncomfortable but be calm and politely advise anyone who sat by them on public vehicles and started exhibiting symptoms of communicable diseases to cover his/her mouth with a handkerchief to prevent others from getting infected. They were also of the view that sickness/illness is inevitable and that everyone is prone to falling sick/ill at any given time or place, hence they will be empathetic towards such persons. Some respondents, however,

indicated they would move away from such persons or avoid sitting close to them. The following extracts from the interviews illustrate the attitudes of some respondents:

> *In fact, if someone sitting by me begins to cough or sneeze frequently, I will feel uncomfortable. You know, what I have observed is that sometimes, some passengers when they know they are coughing for instance, may go and sit at the back seat and close to the window, where they can put their heads out anytime they feel like coughing. That notwithstanding, if any person sits by me and coughs often, I will politely tell the person to cover his mouth or take his head out of the window before he coughs. If an infected person sits by me, I will really feel uncomfortable with such a person.* [32-year-old driver, male]
>
> *To be honest with you, I will feel uncomfortable if a suspected or known infected person sat by me and started coughing or sneezing indiscriminately. But the fact is that nobody goes to the market or shop to buy sickness, and I could also be a victim at a point in time. Besides, public transport is meant for everybody, so it will be difficult to prevent another person from using a service because the person is ill. What I will do in such a situation is to politely advice such a person to cover his/her mouth or nose before coughing or sneezing. They could also put their heads outside of the window before they cough or sneeze. Should the person decide not to adhere to my advice, then I would rather protect myself by covering my nose or alternatively cover my head and part of my body with my cloth. This is one of the reasons why most of us women, normally carry pieces of cloth in our bags when we are travelling on public transport.* [33-year-old female passenger]

Suggestions on possible preventive measures.

Whilst some respondents stated that no measures had been put in place to prevent the spread of communicable diseases at the station and on vehicles, others stated that hand sanitizers, tissues and dustbins were placed at the station and on vehicles to improve sanitation. A passenger observed that:

> *As you can see, there is not even a waiting place for passengers to sit, let alone washrooms for passengers' convenience. If you come and there is no bus, you have to queue on the scotching sun until a bus is made available. If you want to attend to nature's call, you would have to walk a long distance to the other station before you get access to a public toilet. Even there, cleanliness is not adequate, and there is no running water and soap for hand washing. Sometimes, you buy sachet water to wash your hands without soap after visiting the toilet. Look at the station itself, the whole place is covered with filth because there is no waste bin available. It is so bad but what can we do?* [25-year-old male passenger]

On the issue of further preventive measures that could be put in place, most respondents agreed that all stakeholders must act responsibly on the transport system. Covering of the nose and mouth when sneezing, avoiding sharing of objects and regular vaccination were mentioned as some of the measures which could help reduce the spread of communicable diseases on public transport in Ghana. Other respondents also believed that provision of isolated seats for infectious passengers or even isolating infected persons from coming into contact with others could result in reducing the spread of communicable diseases. A 38-year-old male driver at one of the stations asserted that:

> *Sometimes I have a problem with the way people behave. There are people who know that they are infected and do not have to go to public gatherings, yet, because they want to infect other people, they disregard medical advice and do so. I think we should all be responsible enough so that we avoid things that will put us and others at risk.*

A 19-year-old female passenger and student in one of the tertiary institutions also commented on the issue of public education as follows:

> *This issue must be given the same attention that is given to other issues of national interest. The media should make so much noise about it so that people will get to know what they are supposed to do when they are on a vehicle or at the station. When you drive around, you see a lot of billboards advertising so many products. Why can't we provide some billboards sensitizing people on this issue? Nobody knows who is infected at a particular point in time, therefore we are all at risk and must take preventive measures to reduce the risk.*

In suggesting stakeholders who should come together to ensure that effective measures are put in place to prevent the spread of communicable diseases on the public road transport system, a male passenger respondent suggested as follows:

> *It is true that the Driver and Vehicle Licensing Authority (DVLA) and the National Road Safety Commission (NRSC) are mandated to ensure that vehicles put on the roads in Ghana are safe to use, and also the drivers who drive those vehicles have the requisite skills to do so. All these measures are geared towards preventing road crashes and its associated casualties and cost. In addition, they have a role to play as far as the issue we are discussing is concerned. The DVLA, for instance, must ensure that vehicle*

> *reconstruction is done to meet international standards in the arrangement of seats and ventilation on the vehicles as well. The NRSC, on the other hand, could incorporate public education on this issue into their normal education on accident prevention.*

Observation carried out indicated that, out of the eight lorry stations visited, only three had clean environment with adequate sanitation facilities. The remaining five had dusty and un-kept environment and inadequate sanitation facilities (Figures 2 & 3 show the environmental conditions at two of the stations). Also, it was realized that only two of the stations used buses with adequate spacing in the arrangement of seats. One of the stations also had large buses with enough space between the rows, but passengers had to sit in close contact with each other. At the rest of the stations, most vehicles were originally meant to carry goods but they had been converted into passenger-carrying vehicles and passengers had to sit in confined spaces and in close contact with each other.

Figure 3: Un-kept Terminal

Discussion

The results of the study showed that respondents had similar views about what communicable diseases were, and how they could spread. Various examples of communicable diseases were given by respondents; however, there were divergent views on the possibility of such diseases spreading on the public road transport system. Notwithstanding, it came out that respondents would feel uncomfortable putting up with suspected persons on the same vehicle. Respondents also made suggestions as to how some communicable diseases could be prevented from spreading on the public road transport system in Ghana.

Studies conducted in the air transport sector on spread of tuberculosis on aircrafts showed that those who sat in close proximity with infected persons for eight hours continuous were at higher risk of acquiring tuberculosis (WHO, 1998, 2006, 2008). In this study, the data collected on

general knowledge of communicable diseases from the various categories of respondents indicate that all respondents had a fair knowledge of what communicable diseases were. The definition given by the 59year old respondent was not different from how the literature defines a communicable disease. For example, Waithaka (2007 p. 2) defines it as "a disease that is the result of a causative organism spreading from one person to another or from animals to people". Respondents from all categories were able to give examples of communicable diseases and how they were transmitted. This also shows that they had fair idea of communicable diseases.

Most of the respondents indicated that it was possible for some communicable diseases to spread on the public road transport system. Some of the conditions that they cited to buttress their claim were contaminated surfaces like seats, overcrowding at the station and on vehicles, dusty and unhygienic conditions at the station, and unhygienic ways in which food was vended at the station. Some of the conditions mentioned by respondents were found to be consistent with what have been expounded in most literature on epidemiology (see Rothman, Greenland & Lash, 2008; WHO, 2014a) and also in the conceptual framework on disease transmission cycle by CDC (2006). Notwithstanding, the data also showed that some respondents did not believe communicable diseases could spread in the public road transport system. Indeed, a few responses from the passenger category indicated that they had been using public transport for a long time and may have come into contact with infected persons, but they never got infected. This response might have come because normally people are not conscious of where they contract diseases since the symptoms of some of these diseases do not manifest until after some days (Rothman, 2012). It could also be that those who made this assertion had strong immune systems which could reduce their susceptibility, as suggested by the disease transmission cycle, which states

that susceptibility is affected by the state of one's immune system (CDC, 2006). These responses also seem to suggest that people's health-related behaviours may depend on their perceptions of issues like the severity of potential illness, their susceptibility to that illness, benefits of taking preventive action, and hindrances to taking that action.

Responses from the leadership category showed that those who worked in well-established transport organisations with good and well equipped terminals did not see themselves at risk for working in such environment. The risk associated with the use of public transport was expressed by most of the respondents from both the driver and passenger categories, and they explained that people from all walks of life used public transport and one might not know the health status of the person sitting in the next seat. Some assertions from the respondents regarding the risk involved with the use of public transport could be related to what Wilson (1995) indicated that, communicable diseases could be spread on public vehicles themselves, due to the fact that people from different backgrounds congregated in an enclosed area such as public vehicles, where unlike the office environment, the status of the people were not known.

One of the findings suggested that respondents did not want to be in a situation where they would have to put up with people known or suspected to be infected with an infectious disease. Most respondents said they would feel uncomfortable if they sat by a person who coughed or sneezed indiscriminately. The implication of the responses could be that people must endeavour to adopt preventive measures when coughing on the public road transport system if they profess that they will feel uncomfortable with others who are suspected or known to be infected. Another observation was that those who said communicable diseases could not spread on public vehicles also said they would feel uncomfortable if they were to put up with suspected persons.

Invariably, one would have thought that, if one believes they are not at risk, then one should not feel uncomfortable with infected persons.

Although the study has proved that communicable diseases can spread on public transport, it is also the case that putting in place preventive measures can considerably reduce this spread (WHO, 2014a). The data showed that the provision of washrooms with soap and running water, waste bins, hand sanitizers and tissue on the vehicles could compliment health education. It was clear from the data that not so much measures had been put in place at most of the stations to prevent the transmission of diseases. Rather, environmental conditions at some of the stations was a recipe for disaster. As indicated in the Disease Transmission Cycle, the easiest point of breaking the transmission chain is at the mode of transmission. Personal responsibility, change of attitude, provision of adequate sanitation facilities both at the station and on the vehicle, and implementation of adequate measures by all stakeholders were some factors that emerged as possible preventive measures. It was also realized that consistent public education was important in the effort to prevent the spread of some communicable diseases on the public road transport system.

The structure of the public road transport system in Ghana could be a potential medium of spreading some communicable diseases. The COVID-19 pandemic has given a clear indication of how the public road transport system could contribute to the spread of diseases. However, there is no standard policy in place to guide transport operators to ensure adequate measures are put in place to avoid or reduce the incidence of communicable diseases spreading on their medium.

In trying to understand the role national institutions play in reducing the spread of diseases on the public road transport system, what emerged was that since the DVLA and NRSA were responsible for ensuring safety on our roads, they could as well incorporate public education on how to reduce the spread of communicable diseases in the road passenger transport sector.

Conclusion

This study sought to explore the views of public passenger transport operators, drivers, and passengers on the possible spread of communicable disease on the public road transport system in Accra. A qualitative research approach was adopted for the study and in-depth interviews and observation were the methods used for data collection. The results of the study showed that respondents had a fair idea of what communicable diseases were and how they could spread. There were, however, divergent views on the possibility of some communicable disease spreading on the public road transport system. Notwithstanding, the results showed that the potential of the spread of some communicable diseases on the public road transport system in Accra, Ghana, might be very high considering the environmental conditions that were observed at the various lorry stations visited for the study. In addition, the type of vehicles being used at most of the stations and the poor seat arrangement and ventilation on these vehicles may increase the risk of spreading diseases on the transport system. Although most respondents indicated that it was possible for diseases to spread on the transport system, it was realized that they did not make conscious effort to adopt preventive measures that would protect them and others from being infected. It is therefore important for in-depth studies to be conducted, where samples will be collected for laboratory tests, and the results will form the basis for policy guidelines. In the

meantime, it behooves all stakeholders in the transport industry to adopt some preventive measures that will make the use of public transport safer. Also, in the wake of COVID-19, it is imperative for government, through the Ministry of Transport and its regulatory agencies, in collaboration with the Ministry of Health to come out with some documented protocols that must be followed by public transport operators and also ensure strict compliance with these protocols.

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