

UNIVERSITY OF CAPE COAST

PERSPECTIVES OF TRANSPORT OPERATORS AND PASSENGERS ON  
THE SPREAD OF COMMUNICABLE DISEASES ON THE PUBLIC ROAD  
TRANSPORT SYSTEM IN ACCRA, GHANA

AKOTO OTUPIRI DARKO

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MPhil

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THE SPREAD OF COMMUNICABLE DISEASES ON THE PUBLIC ROAD  
TRANSPORT SYSTEM IN ACCRA, GHANA

BY

AKOTO OTUPIRI DARKO

Thesis submitted to the Department of Geography and Regional Planning, Faculty of Social Sciences of the College of Humanities and Legal Studies, University of Cape Coast, in partial fulfilment of the requirements for the award of Master of Philosophy degree in Geography and Regional Planning

JULY 2017

## DECLARATION

### Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature..... Date.....

Name: .....

### Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature.....Date.....

Name: .....

Co-Supervisor's Signature.....Date.....

Name: .....

## ABSTRACT

Transport facilitates socio-economic and political development of every country. In spite of its role in the development of nations, transport has also been identified as a means of spreading some communicable diseases where there are inadequate measures to prevent such spread. Preparedness is facilitated by people's awareness of the existence of these communicable diseases, and their attitude also play a key role in preventing such diseases from spreading. This study sought to explore the views of transport operators and passengers on the spread of communicable diseases on the public road transport system in Accra, Ghana. Qualitative research methods in the form of in-depth interviews and observations were adopted for data collection. Qualitative analysis in the form of thematic analysis was used to analyse data collected from the field. The study concluded that, at least some section of transport operators, as well as passengers are aware of the possibility of spreading communicable diseases in the public road transport system but are not very conscious of this fact, therefore they do behave in ways that could increase the risk of spread of diseases through their daily transport activities. However, the study also showed that some transport operators and passengers are prepared to adopt preventive measures to make the use of public transport as safe as possible. The study recommends strict adherence to international acceptable standards in the construction and arrangement of seats on passenger vehicles to avoid overcrowding.

## KEY WORDS

Communicable Diseases

Operators

Passengers

Perspectives

Public Road Transport System

Spread

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## DEDICATION

To my wife, Akosua,

And my kids,

Ekua, Akosua, Nana Ama and Kofi Akoto Jnr.

## TABLE OF CONTENTS

	Page
DECLARATION	ii
ABSTRACT	iii
ACKNOWLEDGEMENTS	v
DEDICATION	vi
LIST OF TABLES	xii
LIST OF FIGURES	xiii
LIST OF PLATES	xiv
LIST OF ACRONYMS	xv
CHAPTER ONE: INTRODUCTION	1
Background to the Study	1
State of the Problem	5
Research Questions	6
Research Objectives	7
Significance of the Study	8
Scope of Study	8
Definition of Terms	9
Organization of the Study	10
CHAPTER TWO: LITERATURE REVIEW	12
Introduction	12
Importance of Transport	13
Road Transport in Ghana	15
State of Road Transport in Ghana	16
Organization of Road Passenger Transport in Ghana	17

Ministry of Transport	17
Driver and Vehicle Licensing Authority	18
National Road Safety Commission	19
Metro Mass Transit	19
Intercity STC Coaches Limited	21
Ghana Road Transport Coordinating Council	22
Ghana Private Road Transport Union	22
VIP Jeoun Company	23
Communicable Diseases	26
Epidemics: How they break out and spread	26
<i>Basic principle of epidemics</i>	26
<i>Agent</i>	29
<i>Host</i>	30
<i>Environment</i>	31
Transmission of communicable diseases	33
Communicable Diseases of Epidemiologic Importance	36
Cholera	36
Tuberculosis	37
Ebola virus	38
Meningitis	38
H1N1(Swine flu)	39
Chickenpox	40
Transport and Spread of Epidemics	40
Preparedness for communicable diseases	41
<i>Preparedness in the transport industry</i>	42

Theoretical/Conceptual Framework	44
Health Communication Theory	44
The communication process	45
<i>Audience</i>	45
<i>Message</i>	46
<i>Source</i>	49
<i>Channel</i>	49
Summary	50
CHAPTER THREE: RESEARCH METHODOLOGY	51
Introduction	51
Research Design	51
Study Area	52
Population	55
Sampling Procedure	56
Data Collection Instruments	58
Pre Testing	60
Data Collection Procedures	61
Ethical Considerations	62
Data Processing and Analysis	62
Summary	63
CHAPTER FOUR: RESULTS AND DISCUSSION	65
Introduction	65
Results from Observation	66
Achimota Bus Terminal	66
Intercity STC Coaches Limited Yard	67

VIP Jeoun Yard	68
Circle Neoplan Station	69
Kaneshie Market Station	70
Metro Mass Station	71
Tudu Main Station	72
Madina Main Lorry Station	73
Demographic Characteristics of Respondents	74
Sex distribution of respondents	75
Age distribution of respondents	75
Respondents occupation	77
Educational background of respondents	78
Marital status of respondents	79
Religious affiliation of respondents	79
Background of Terminals Surveyed	80
General views (knowledge) on communicable diseases	82
Awareness of the spread of communicable diseases on public road transport system	84
Risk assessment of operators and passengers	88
People's perception and attitude toward suspected infected persons on public/commercial vehicles	91
Operators and passengers' suggestions on possible preventive measures	93
Discussion of Results	99
Summary	105

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	106
Introduction	106
Summary	106
Conclusions	110
Recommendations	111
Avenues for future research	114
REFERENCES	116
APPENDICES	123
APPENDIX A: Interview Guide for passengers	123
APPENDIX B: Interview Guide for drivers	126
APPENDIX C: Interview Guide for leadership	129
APPENDIX D: Observation Checklist	132

## LIST OF TABLES

Table	Page
1: Sample size of categories	58
2: Sex Distribution of Respondents	75
3: Age of Respondents	76
4: Occupation of Respondents	77
5: Educational Background of Respondents	78
6: Marital Status of Respondents	79
7: Religious Affiliation of Respondents	80

## LIST OF FIGURES

<b>Figure</b>	<b>Page</b>
1: Organisation of Transport Players in Ghana	17
2: Epidemiology Triad	27
3: Infectious disease model	28
4: Disease Transmission Cycle	34
5: Conceptual Framework	45
6: Map of Study Area	53



## LIST OF PLATES

<b>Plate</b>	<b>Page</b>
1A and 1B: Achimota Terminal provided with waste bins at vantage points	67
2A and 2B: STC Yard	68
3A and 3B: VIP Transport waiting area and main yard	69
4A and 4B: Circle Neoplan Station	70
5A and 5B: Kaneshie Market Lorry Station with refuse scattered all over	71
6A and 6B: Kaneshie Metro Mass Transit Station by the road side	72
7A and 7B: Tudu Main Lorry Station	73
8A and 8B: Madina Main Lorry Station	74

## LIST OF ACRONYMS

ADB	Agriculture Development Bank
AMA	Accra Metropolitan Assembly
DVLA	Driver and Vehicle Licensing Authority
ECOWAS	Economic Community of West African States
GCTA	Ghana Cooperative Transport Association
GH	Ghana
GOIL	Ghana Oil Company Limited
GPRTU	Ghana Private Road Transport Union
GRTCC	Ghana Road Transport Coordinating Council
HIV	Human immunodeficiency virus
IATA	International Air Transport Association
IBRD	International Bank for Reconstruction and Development
ICAO	International Civil Aviation Organisation
IDIs	In-depth interviews
IFRCRCS	International Federation of Red Cross and Red Crescent Society
MMT	Metro Mass Transit
MoH	Ministry of Health
MoT	Ministry of Transport
NIB	National Investment Bank
NRSC	National Road Safety Commission
PLWHA	People living with HIV/AIDS
PPE	Personal Protective Equipment

PROTOA	Progressive Transport Owners Association
SARS	Severe Acute Respiratory Syndrome
SIC	State Insurance Company
SSNIT	Social Security and National Insurance Trust
STC	State Transport Company
TB	Tuberculosis
TUC	Trades Union Congress
WASH	Water, Sanitation and Hygiene
WHO	World Health Organisation

## CHAPTER ONE

### INTRODUCTION

#### **Background to the Study**

Transport facilitates socio-economic and political development of every country. Thus transport 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 (Hoyle & Knowles, 1992). The role of transport in the socio-economic development of Ghana cannot be over emphasized. As far back as pre-colonial era, right through the colonial era and independence to present time, transport has played a key role in Ghana's economic development. 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. Transport has played a keen role over the years in creating employment opportunities for tens of thousands of Ghanaians. Presently, the transport sector has employed a lot of people and still has the capacity to employ more.

However, transport is also said to be dangerous in the sense that it has the potential to cause harm to humans and property (Abane, 2012). All forms of transport, be it land, air or water, is associated with some form of risk. There is

therefore the need to make transport safe by putting in place measures that control individual behaviour in order to reduce the extent of harm to people and property.

Safety is the absence of injury or harm to humans as well as damage to property. Faulks (1990) asserts that the movement of people from where they are to where they prefer to be and goods to where their relative value will be greater, is the function of transport. It follows, therefore, that the object or the end product of transport is the arrival. Just as the product of a tailor or seamstress is a well-fitting suit, so is safe arrival the product of transport. Obviously this arrival must be safe; that is, passengers and goods must be taken to their destinations in safety and without harm or damage.

There are several modes of transport that operate in Ghana such as air, sea, rail, inland water ways, pipelines and road. Each of these modes of transport has its peculiar advantages and disadvantages that make it suitable for a particular movement, and unsuitable for another. By far, road transport is the only mode that has the advantage of providing door-to-door movement, and is therefore widely used in the country.

Indeed, over 95% of internal passenger traffic is moved by road transport (Ministry of Transport, 2008). 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 great majority of the citizenry for various economic and social reasons. Relatively, one cannot avoid the use of public transport in Ghana, where most of the citizenry cannot afford

acquiring their own private cars. Using public transport means mingling with different kinds of people on daily basis which has implications for their health and comfort. Of major concern is the spread of communicable diseases.

Communicable diseases continue to emerge frequently in the world, and especially in Africa (World Health Organisation, 2015). Although there has been consistent effort to eradicate communicable diseases through the development of vaccines for immunisation, African countries continue to record deaths through epidemics and pandemics (WHO).

Globally, there have been several outbreaks of communicable diseases at least within the last two decades. For example, in 2003 there were reports of severe acute respiratory syndrome (SARS) in some countries, especially in Asia and South America. In 2009, there was a pandemic of H1N1 (tagged the Swine Flu) which affected countries in North America, Europe, Asia and Africa. Also, in 2014, there was an outbreak of the Ebola virus in some West African countries, most of which have very close ties with Ghana. The death toll was 11,295 out of recorded cases of 28,000 (WHO, 2015).

In Ghana, cholera for instance has become endemic, with people losing their lives almost every year. In 2014, there was a serious outbreak of cholera which affected a total of 28,922 persons, including 243 deaths. The outbreak was reported in 130 out of the 216 districts in all the 10 regions of the country, with the Greater Accra Region recording the highest number of deaths (Ghana Health Service & Ministry of Health, 2015). Early 2016, there was an outbreak of pneumococcal meningitis in some parts of the country, and again over 100 people

lost their lives. All these reports indicate that although there has been consistent effort by the World Health Organisation (WHO) and other stakeholders to eradicate communicable diseases, new viruses continue to emerge whereas old ones also reemerge and most of the time African countries are the worst victims.

Transport has generally been identified as a means of spreading communicable diseases (Allen, 2015; Feske, Teeter, Musser, & Graviss, 2011; Wilson, 1995). For example, in 1998, there were reports of transmission of tuberculosis on some aircrafts 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 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 body fluid of an infected person (WHO, 2014b). On the other hand, some diseases like tuberculosis, common colds and H1N1 are airborne and can be contracted by inhaling the contaminated air by an infected person coughing or sneezing (WHO).

## Statement of the Problem

Considering the high number of people that are transported by public transport at every point in time, and their propensity to travel inter-cities, these transport systems could be a potential source for the spread of any epidemic of communicable diseases. Anecdotal evidence has it that over the years, public passenger transport providers do not have any formal plan to contain communicable diseases, should they break out. It has been observed that most of the lorry stations in Ghana, especially Accra, have poor sanitary conditions, which could aid the spread of communicable diseases even within the station environment. It has also been observed that most of the vehicles that are used for the movement of people in Ghana were originally meant for movement of goods.

The absence of standard specifications for the conversion of these vehicles, or if there is any at all, then lack of adherence and enforcement have 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). Also, where air-conditioned buses are used, there is the possibility of spreading communicable diseases on such vehicles since there is no proper ventilation system such as those provided on aircrafts. Besides, people's attitude on public vehicles (i.e. coughing or sneezing without covering the mouth and nose, and also openly spitting while onboard a vehicle) also has the potential of



aiding the spread of communicable diseases in the road passenger transport sector in Ghana.

Notwithstanding all the problems identified, there has been little research into ways of preventing the spread of communicable diseases in the road passenger transport sector in Ghana. In addition, 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 (for example Jorgensen & Abane, 1999; Abane, 2012; Afukaar, 2001, 2003) 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, and Ebola in some neighbouring African countries. 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. It set out to address the following questions:

1. What are the general views of transport operators, especially drivers and passengers, on the spread of communicable diseases?
2. What is the level of awareness of transport operators and passengers on the spread of communicable diseases through the use of public vehicles?
3. How do drivers and passengers assess the risk of possible infections on public transport system?

4. What attitude do passengers put up towards suspected infected persons on public transport system?
5. What measures are in place or should be instituted to prevent the spread of communicable diseases on public transport systems?

### **Objectives**

The general objective of this study was to explore the views of road passenger transport operators and passengers on the spread of communicable diseases on public vehicles in Accra.

Specifically, the study sought to:

1. Examine the general views of operators including drivers and passengers on communicable diseases and how they are spread;
2. Explore operators and passengers' awareness of the spread of communicable diseases on public vehicles;
3. Assess the risks regarding possible infection of communicable diseases on public vehicles;
4. Interrogate people's perspective and attitudes towards suspected infected persons on public vehicles; and
5. Explore people's suggestions on possible preventive measures that could be adopted to prevent the spread of communicable diseases on public vehicles.

### **Significance of the Study**

The study has the potential to help road passenger transport operators to develop and improve upon best practices in infection prevention and control through their activities. The study also sought to unearth other subtle ways which may not be obvious but through which communicable diseases could be acquired on public vehicles. This would inform the public and transport operators in taking preventive measures. The study could also inform policy makers in developing new policies and reviewing old ones for controlling the spread of diseases in public places, especially in the road passenger transport sector. Furthermore, the study could form the basis for further in-depth studies into prevention of the spread of communicable diseases through movement of people by road in Ghana.

### **Scope of the Study**

This was an exploratory study which set out to ascertain public awareness on the spread of communicable diseases in the road passenger transport sector in Ghana, and their suggestions on preventing such spread. Although the study sought to ascertain the awareness of Ghanaians of the phenomenon stated above, the intention was not to generalise the results but only to know both the scale of the challenge and available preventive measures instituted by transport operators in addressing the issue. The study was confined to Accra, the capital of Ghana, and only major transport stations in the city were considered. Also, the study was limited to operators and passengers engaged in intercity travels. Intra-city operators in Accra were excluded. It must be emphasised that those stations

considered for the study are somehow clustered within particular areas of the city and do not cover the entire city. However, they were considered as the major places that people gather in order to travel to other cities. Furthermore, anything that was not within the scope described, for example taking of samples both on vehicles and at the station environment for laboratory test and making inferences from such results were beyond the scope of this study.

### **Definition of Terms**

For the purpose of the study, some terms as have been used may differ from their everyday meaning. The following terms are therefore defined in the context in which they have been used:

Public transport is used to mean any transport service provided on commercial basis with the view to generating revenue.

Public vehicles are vehicles that everybody has the right to use provided they abide by the rules governing the use of such vehicles.

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. Communicable and infectious have the same meaning and are used interchangeably.

An epidemic is defined as the occurrence of cases of an illness with a frequency that is clearly in excess of what is expected in a given region, therefore demanding emergency control measures.

Agent (also known as pathogen) is any microorganism that has the potential of causing an infection in a person.

Host is a person or animal that affords subsistence or lodgment to an infectious agent under natural conditions. Types include an obligate host, definitive (primary) host, intermediate host and a transport host.

A vector of infection is an insect or any living carrier that transports an infectious agent from an infected individual or its waste to a susceptible individual or its food or immediate surroundings. Both biological and mechanical transmissions are encountered.

A reservoir is any person, animal, arthropod, plant, soil, or substance, or a combination of these, in which an infectious agent normally lives and multiplies, on which it depends primarily for survival, and where it reproduces itself in such a manner that it can be transmitted to a susceptible host. It is the natural habitat of the infectious agent.

### **Organisation of the Study**

The study is organised into five chapters. Chapter One deals with the introduction, which includes background to the study, problem statement, research questions, objectives of study, significance of the study, scope of study,

and definition of terms. Chapter Two deals with literature review covering what transport is generally about and a brief history of road transport in Ghana and how it is structured presently. Other issues of interest include communicable diseases with emphases on epidemics and how transport has facilitated their spread. The chapter also looks at the theoretical framework based on which the study was conducted. Chapter Three covers the methodology adopted for the study. It looks at the research design or paradigm, study area, study populations, sampling method and sample size, methods of data collection and analysis and how quality control was ensured. While Chapter Four covers an analysis of the data collected from the field and a discussion of the findings of the study, the last chapter provides a summary of the study, conclusion and recommendations.

## CHAPTER TWO

### LITERATURE REVIEW

#### Introduction

This study was aimed at exploring the views of transport operators and passengers of the spread of communicable diseases on public vehicles in the road passenger transport sector in Accra, Ghana. This chapter focuses on literature review and it begins by looking at what transport generally is, and the importance of transport in socio-economic development. It also looks at the various forms and modes of transport with special emphasis on road transport. The chapter further looks at a brief history of transport in Ghana; how it started, how it has evolved through the years and the current state of road passenger transport in the country. Literature is also reviewed on issues of communicable diseases with emphasis on epidemics, how they break out and how they spread. It again looks at how road passenger transport has facilitated the spread of communicable diseases both globally and locally.

Literature review further looks at how prepared transport providers are in preventing the spread of communicable diseases on public vehicles in other transport sectors especially in the air transport industry, and what should be put in place in the road passenger sector so as to reduce the spread of communicable diseases on public vehicles. Finally, literature review discusses Health Communication Theory, which incorporates the Prochaska's Stages of Change

Model, the Health Belief Model and the Diffusion of Innovation Theory, which together form the framework on which the study was carried out.

### **Importance of Transport**

Transportation is central to economic activity and to people's lives. It enables them to engage in work, attend school, shop for food and other goods, and also participate in all of the activities that comprise human existence (Levinson, Liu, Garrison, Danczyk, & Corbett, 2009). Transport is the live wire of every economy. Like the arteries of the human body, transport facilitates things to happen. People travel for various economic, social, political and security reasons (Gubbins, 1988). Transportation is concerned with mobility, particularly how this mobility is taking place in the context of a wide variety of conditions. Mobility is a geographical endeavour since it trades space for cost (Rodrigue, Comtois, & Slack, 2006).

Movements of people, goods and information have always been fundamental components of human societies. Contemporary economic processes have been accompanied by a significant increase in mobility and higher levels of accessibility. The purpose of transport is to overcome space, which is shaped by a variety of human and physical constraints such as distance, time, administrative divisions and topography. These constraints, jointly confer a friction to any movement, commonly known as the friction of distance (Rodrigue et al., 2006).

Ullman (1957) explains that people move for three reasons which he called complementarity, transferability, and intervening opportunity. Complementarity looks at the uneven distribution of the world's resources, and



the fact that some locations have some resources in abundance whereas others do not. As a result, those who have excess will supply to those locations that do not have and are in demand. Transferability refers to the ease with which people and goods move from one location to the other in terms of cost, accessibility and the relative value at the destination. Intervening opportunity refers to the situation where there is an alternative means closer to the location in demand which may discourage movement to a farther distance for the same commodity. For these reasons, the assertion of Munby (1968) that “there is no escape from transport” comes true. The movement of people from where they are to where they prefer to be and goods to where their relative value will be higher is termed transport (Faulks, 1990).

Transport is broadly discussed under three main categories which are air based transport, water based transport and land based transport. Within these categories however, there are various modes which include air, sea, inland water, rail, pipeline and road. In each of the modes of transport, movement is categorised into people and goods or freight.

Of all the transport modes, the road is the only one that is able to provide door-to-door service. Road transport therefore acts as a feeder to all the other modes in both the movement of people and goods. In most countries, especially the developing ones, road transport dominates the internal movement of people and goods. In most of the developed countries however, internal movement is dominated by rail transport which has the capacity to move a large number of people at a particular point in time.

## Road Transport in Ghana

In Ghana, road transport dominates the movement of both people and goods internally, and also between other neighbouring countries. Road transport has a long history which dates back to the pre-colonial days. Before the advent of the motor car, people worldwide depended on walking and the use of animals for travelling from one place to the other. Ghana was no exception, and it is on record that before the coming of the white man to Africa, the inhabitants depended mostly on walking for their internal journeys. According to Gould (1960) before the 1900s, trade between Europeans and Ghanaians was centered along the coastal areas which had small ports scattered around. Those who lived far from the coastal areas had to travel on foot to these port areas to transact business. Some of these journeys could take several days, weeks or even months to make, depending on how far one lived from the coast. As time went by, and with the identification of natural resources in the hinterlands of the country, access routes were constructed to enable the resources to be reached for extraction and export. Some of the access routes initially were not constructed for the movement of the motor vehicle, but for walking and movement by animal drawn carts.

Later on, the railway was constructed by the colonial government to link the resource areas like Tarkwa in the Western Region and Mangoase in the Eastern Region to the ports, with the view to export these resources to Europe and other continents. Even with the construction of the railway, it was still clear that some of the resource areas could not be reached. As a result, more feeders were constructed to link the resource areas to the railway so the resources could be

transported by road onto the rail for onward transfer to the ports for export. With time, some of these feeders were metaled to facilitate the rolling of barrels which had become a method of loading cocoa, palm oil and other related resources for transporting.

With the advent of the motor vehicle and its introduction into the country by the colonial government, some of the feeders were further developed to enable motor vehicles to be driven on. This development led to intense competition between the road and the rail for the movement of both passengers and goods.

When Ghana attained independence in 1957, the roads were further developed at the expense of the railway which was capital intensive. Most of the roads were expanded into trunk roads connecting the major urban and rural areas. Today, the road transport dominates the movement of people and goods in the country. Over 95% of internal travel is by road transport (Ministry of Transport, 2008).

### **State of Road Passenger Transport in Ghana**

Road passenger transport in Ghana can be divided into individual (where people use their own private vehicles to make journeys), and collective (where people use the service of public transport operators at a fee). Public transport, according to an Integrated Transport Policy, (Egis Bceom International, 2010) handles over 85% of the movement of people in Ghana. This means that a lot of the Ghanaian populace depend on public transport for most of their internal journeys.

## Organisation of Road Passenger Transport in Ghana

According to the Integrated Transport Report (Egis Bceom International, 2010), prepared for the Government of Ghana through the Ministry of Transport, road transport in Ghana is organised around the following players: authorities, transport unions and passengers and cargo owners (Figure 1). The Ministry of Transport is the highest authority in the transport sector, and it has various regulatory institutions under it. The Transport Unions represent the service providers in both passenger and cargo services, whereas the passengers and cargo owners are the users of these services.

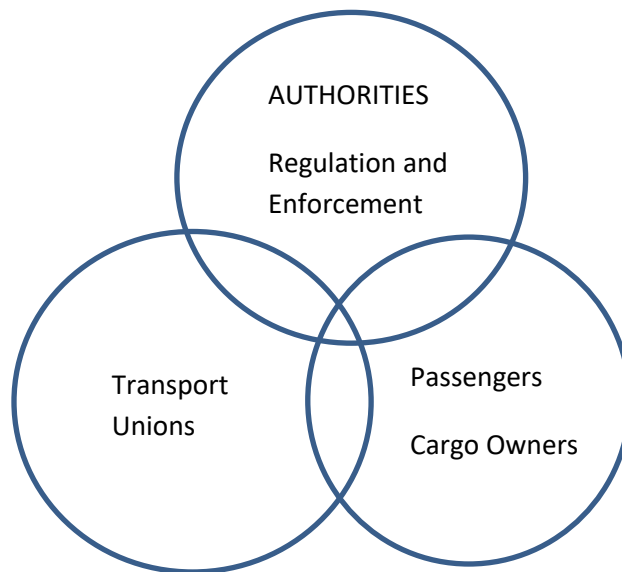


Figure 1: Organisation of Transport Players in Ghana  
Source: Egis Bceom International, 2010

### Ministry of Transport

The Ministry of Transport is in charge of all issues concerning transportation in Ghana. The mandate of the Ministry of Transport as expressed in their mission statement is to provide leadership and guidance for the development

of Ghana's transportation system through effective policy formulation, market regulation, asset management and service provision. The vision of the ministry is to create an integrated, modally complimentary, cost effective, safe, secure, sustainable and seamless transportation system responsive to the needs of society, supporting growth and poverty reduction and capable of establishing Ghana as a transportation hub of West Africa (Ministry of Transport, 2016). To support the work of the ministry, there are some agencies that are in charge of specific issues concerning transportation in Ghana. These are next outlined.

### **Driver and Vehicle Licensing Authority**

The Driver and Vehicle Licensing Authority (DVLA) was established by the driver and licensing authority act, 1999, Act 569 to promote good driving standards in the country and ensure the use of roadworthy vehicles on the roads and in other public places. Some of the duties of DVLA as stipulated in the Act are as follows:

- Establish standards and methods for the training and testing of driving instructors and drivers of motor vehicles and riders of motor cycles;
- Establish standards and methods for the training and testing of the vehicle examiners;
- Provide syllabi for driver training and the training of instructors;
- Register and license driving schools, and also license driving instructors;  
and
- License and regulate private garages to undertake vehicle testing.

### **National Road Safety Commission**

The National Road Safety Commission (NRSC) was established by the NRSC Act 1999 (Act 567) with the mandate to plan, develop, promote and coordinate policies in relation to them. The NRSC also has the mandate to carry out the under listed functions among other things:

- Encourage the development of road safety education as part of the curriculum and the training of teachers in road safety;
- Carry out special projects for the improvement of road safety;
- Make recommendations to the Ministry of Transport and such bodies, as they may determine measures which are calculated to prevent accidents involving the use of vehicles on roads;
- Conduct investigations into road safety issues and advise MoT on them; and
- Advice MoT on the formulation of road safety policies and action programmes.

The organization has regional managers who are in charge of road safety issues in all the ten administrative regions of the country.

### **Metro Mass Transit Limited**

In 2001, the Former President of Ghana, Mr. John Agyekum Kuffour in his inaugural address to the nation directed the re-introduction of public mass transport in the metropolitan and municipal areas to ensure safe, affordable, efficient and reliable movement of the public. To actualize the president's

directive, Metro Mass Transit Limited (MMT) was incorporated in March, 2003 as a limited liability company under the Ghana Companies code 1963 Act 179. The company is a joint venture between the government of Ghana (45% shares in the form of assets) and six corporate entities with 55% shares. They are Social Security and National Insurance Trust (SSNIT), the National Investment Bank (NIB), the State Insurance Company of Ghana Limited (SIC), Prudential Bank Limited, Agricultural Development Bank (ADB) and Ghana Oil Company Limited (GOIL).

The decision to establish the company was borne out of the need to develop a mass transit system for moving large numbers of people at least cost. Metro Mass Transit (MMT) Limited was established as a public – private sector organization in line with the government’s policy of promoting public-private partnership in nation building. Metro Mass Transit has a total of sixteen depots across the nation and operates a total fleet of 1107 including those that are temporarily broken down and those earmarked for scraping. The company operates three types of service which are intra city, intercity and inter urban.

Although Metro Mass Transit Limited is an operator, it has the status of a regulatory arm of the Ministry of Transport. The regulatory role that the company plays, according to the organogram of the Ministry of Transport is the stabilization of transport fares in the country. The company performs this task by charging lower fares than that charged by the major transport union which is the Ghana Private Road Transport Union (GPRTU).

### **Intercity STC Coaches Limited**

The origin and the roots of the company began in 1909 as a government's transport department of the British colonial administration. It was primarily created to cater for the needs of the central government. A Legislative Instrument 414 of 9<sup>th</sup> March, 1965 made it a corporate body to operate commercial passenger services and named State Transport Corporation (STC). In January 1968 the government also created a haulage division to operate the road haulage of both dry and wet cargo. This unit was handed over to STC to manage alongside the passenger service division.

The company was later incorporated in June 1995 as a Limited Liability Company under the Ghana Companies Code 1962, Act 179 in the name of State Transport Company Limited. In 2000 the company was put on divesture and won by Vanef STC Consortium. In 2003 the company was renamed Intercity STC Coaches Limited under a new management. The vision of STC is to be the leader in the road transport industry in Ghana and the ECOWAS sub-region beyond bus transportation business. The corporate mission is to consistently and profitably deliver safe, comfortable and reliable road transport and allied services, using highly motivated, competent workforce and state of the art facilities to meet the aspirations of all (Traffic Manager, personal communication, June 28, 2016).

Aside of its core business, STC also provides the following allied services to all shades of clientele:

- Park and ride services to customers who require security for their vehicles while they travel on STC and non-STC services;



- Consultancy services in the areas of fleet management, training and capacity building, valuation services and best practices in transport management;
- Courier services which are operated simultaneously with the advertised passenger services. Besides, the service is also operated separately from the bus services by use of delivery vans and motor cycles.

### **Ghana Road Transport Coordinating Council**

The Ghana Road Transport Coordinating Council (GRTCC) is the main institution that represents road transport professionals in Ghana. The GRTCC is the main umbrella union comprising about twenty-three identified public and private sector unions nationwide representing operators from the passenger and freight sectors (for hire and reward).

### **Ghana Private Road Transport Union**

The GPRTU is by far the largest union estimated to cover about 60% of total transport demand. This percentage includes both passenger and freight. The GPRTU mainly represents fleet owners, but also owner-drivers and “pure drivers” throughout the country in the passenger and freight sectors (Egis Bceom International, 2010). The main objective of the GPRTU is to organise commercial vehicle owners, owner/drivers, employed professional drivers, porters and trained guards who are engaged in the road transport industry of private sector into an organisation for them to protect, sustain and promote their common interest to provide a reliable and effective road transport system (Ghana Private Road

Transport Union, 2015). Membership is therefore opened to vehicle owners who are willing to join the union, as well as drivers with professional license.

The highest decision making body of the union is the Quadrennial Delegates Conference. The next decision making body is the National Executive Committee, followed by the National Working (Steering) Committee, the National Secretariat which is chaired by the national chairman of the union, with the national secretary as the secretary general. Apart from the national secretariat, there are also ten administrative regions under which are the branches and the local unions (National Secretary, personal communication, June 27 2016). According to the office of the General Secretary of the union, although there is no database on membership, it is estimated that the union has about 90,000 members from 900 branches across the country. Other unions in the road passenger transport sector in Ghana are the Ghana Cooperative Transport Association (GCTA), and the Progressive Transport Owners Association (PROTOA).

### **VIP Jeoun Company**

The VIP Jeoun Transport Company was established in September 2009 by four individuals who use to be members of the GPRTU, and who operated their vehicles from the Neoplan Lorry Station in Accra. The company is a partnership between the four individuals, and it has a total fleet of 420 buses with 12 branches in seven out of the ten regions in the country. The regions where the company has no branches are Volta region, Northern region, and Upper East region. The fleet of the company is made up of air-conditioned commuter buses with luxurious

seats, mostly imported from Asia. The company operates only intercity services, but also provides hiring services to the public. Initially, drivers who use to drive the buses of the four individuals were those who started the operations of the company, but subsequently, employment of additional drivers has strictly been by recommendations by the existing drivers (Station Manager, personal communication, August 9, 2016).

All the above transport organisations have contributed to meeting the travel demands of the public in Ghana. However, there are several challenges that confront the road passenger transport operations in the country. Firstly, there is not enough financial support by central government to the transport operators. Secondly, most of the transport organisations are not managed by professionals. Also, entry into the road passenger transport is not restricted. The absence of conditions to enter into the market explains the lack of professionalism which dominates the road transport industry in Ghana.

Other challenges that face the road passenger transport are road crashes, congestion especially in the cities, lack of adequate infrastructure in the form of roads and terminals, poor sanitation at the lorry stations and on vehicles, and the conversion of cargo vehicles into passenger carrying vehicles. Most of the vehicles that are used for the movement of people in Ghana were originally built for movement of perishable goods. Most of these vehicles are mini buses that are used for intra city, intercity, and rural urban services. Although there is a provision in the road traffic regulation [L. I. 2180 of 2012, Regulation 19; sub regulations (1) and (4)], this provision is not strictly adhered to. For example, sub

regulation (1) states that “a person who owns a motor vehicle shall obtain approval from the Licensing Authority before modifying the motor vehicle”. Sub regulation (4) further states that “despite sub regulation (1), a motor vehicle for carrying goods may be converted to carry passengers where the conversion is in accordance with standards prescribed by the Licensing Authority” (Republic of Ghana, 2012 p. 18-19). The standards for physical conversion, as stipulated by the DVLA for instance, require that the space between the seats during conversion should not be less than 70mm. The standard operating procedures for the DVLA also provides the requirements and processes that an applicant needs to go through before a conversion is made. However, during the conversion of such vehicles, the seating capacity is increased by arranging the seats very close to each other, and this results in increased passenger capacity which is more than the original capacity if the vehicles were manufactured for the carriage of passengers.

This problem arises as a result of people not adhering to the requirements and processes as stipulated by the DVLA. In situations where they are asked to remove some of the seats during physical inspection for the provision of road worthy certificate, these owners do so, but go back to do the wrong thing as soon as they get the certificate. Even where the vehicles are built originally for the carriage of passenger, in some situations, the seats are reconstructed to increase the seating capacity. The end result of this is congestion on the vehicles which could easily aid the spread of communicable diseases on board should there be any outbreak. Also, because the vehicles were originally built for cargo, most of them are without ventilation, and in converting them into passenger vehicles, the

windows are most of the time not constructed according to standard hence affecting the ventilation system of the vehicles.

### **Communicable Diseases**

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 (Last, 1983). Communicable and infectious have the same meaning and are used interchangeably. Communicable diseases are therefore diseases that can be passed on from animals to humans or from humans to humans. Communicable diseases normally occur in the form of epidemic outbreak.

### **Epidemics: How they break out and spread**

An epidemic is defined as the occurrence of cases of an illness with a frequency that is clearly in excess of what is expected in a given region, therefore demanding emergency control measures (Last, 1983). This implies that during the outbreak of epidemics, a lot of people within a particular geographical location are affected.

#### ***Basic principle of epidemics***

A disease epidemic or outbreak occurs when there are more people suffering from a particular illness than what would normally be expected. Therefore, emergency control measures are needed. An epidemic or outbreak will

only occur if the equilibrium is changed between the population's susceptibility (host or reservoir), the virulence of the infectious agent (bacteria, viruses, parasites, or fungi or their products) and the environment that promotes the exposure are upset.

The study of epidemics can better be understood by using the epidemiologic triad or triangle to explain the various factors that contribute to an outbreak (Fig.2). Epidemiology is the study of the distribution and determinants of health-related states and events in populations, and the application of this study to control health problems (Last, 1983).

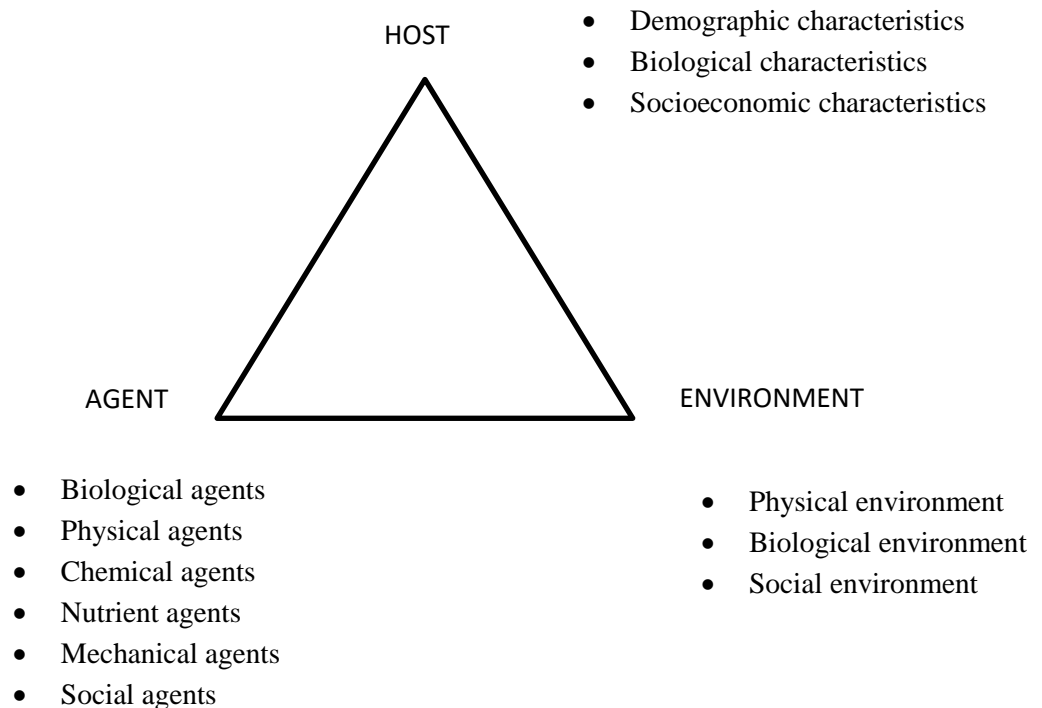


Fig. 2: Epidemiology Triad

Source: Centers for Disease Control and Prevention (2006) p. 52

The host, agent and environmental factors have to be conducive for the disease to occur. All communicable diseases require that the three factors are present for individuals to be affected (Waithaka, 2007).

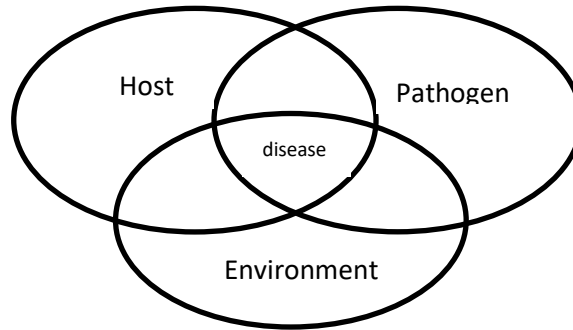


Fig. 3: Infectious Disease Model  
Source: Centers for Disease Control and Prevention (2006)

It is important to study communicable diseases epidemiology to: (a) know the changing patterns of infectious diseases (b) discover new infections and (c) the possibility that some chronic diseases have an infective origin. Nelson (2007) asserts that the study of epidemiology of communicable diseases includes evaluation of the factors leading to infection by an organism, factors affecting the transmission of an organism, and those associated with clinically recognisable disease among those who are infected.

Nelson (2007) further states that when new epidemics of infectious diseases are described, they are usually first studied and described according to their epidemiologic characteristics. New infectious diseases can be classified according to their epidemiologic, clinical, or microbiologic features. Knowledge of all these characteristics is therefore important, but the epidemiologic features of a disease are however of paramount importance for a public health professional or

an epidemiologist who is concerned primarily with controlling or preventing the epidemic spread of an infection.

A vector of infection is an insect or any living carrier that transports an infectious agent from an infected individual or its waste to a susceptible individual or its food or immediate surroundings. Both biological and mechanical transmissions are encountered.

A reservoir is any person, animal, arthropod, plant, soil, or substance, or a combination of these, in which an infectious agent normally lives and multiplies, on which it depends primarily for survival, and where it reproduces itself in such a manner that it can be transmitted to a susceptible host. It is the natural habitat of the infectious agent.

### *Agent*

Agent, originally referred to an infectious microorganism or pathogen: a virus, bacterium, parasite, or other microbe. Generally, the agent must be present for disease to occur; however, the presence of that agent alone is not always sufficient to cause disease. A variety of factors influence whether exposure to an organism will result in disease, including the organism's pathogenicity (ability to cause disease) and dose.

Over time, the concept of agent has been broadened to include chemical and physical causes of disease or injury. These include chemical contaminants (such as the L-tryptophan contaminant responsible for eosinophilia-myalgia syndrome), as well as physical forces (such as repetitive mechanical forces associated with carpal tunnel syndrome). While the epidemiologic triad serves as



a useful model for many diseases, it has proven inadequate for cardiovascular disease, cancer, and other diseases that appear to have multiple contributing causes without a single necessary one.

Infectious disease agents are constantly developing where it is possible to multiply most easily either in susceptible persons, vectors, animals or in the environment. Because their genes are mutated or changed at random quite rapidly, new features appear that might be better adapted to the environment and able to spread to new location, disappear to reappear and infect more vulnerable populations. Some infectious agents cause higher rates of illness and death because they have become resistant to available treatment or are more virulent, leading to major outbreaks. It should be noted that a disease outbreak will not occur if an infectious agent of a particular disease is not present in the environment and is not introduced after a disaster for instance, even if environmental conditions are ideal for transmission.

### *Host*

Host refers to the human who can get the disease or a person or an animal that affords subsistence or lodgment to an infectious agent under natural conditions. Types include: an obligate host, definitive (primary) host, intermediate host and a transport host. A variety of factors intrinsic to the host, sometimes called risk factors, can influence an individual's exposure, susceptibility, or response to a causative agent. Opportunities for exposure are often influenced by behaviours such as sexual practices, hygiene, and other personal choices as well as by age and sex. Susceptibility and response to an agent are influenced by

factors such as genetic composition, nutritional and immunologic status, anatomic structure, presence of disease or medications, and psychological makeup. Certain individuals are more vulnerable to infectious diseases or the more severe form of the illness. Immunity deprived persons like those with poor nutrition, TB or HIV are an example. Children less than five years of age and the elderly are at the greatest risk of morbidity and mortality from infectious diseases particularly the malnourished. Initial assessment and surveillance is critical to identify the most at risk groups so that they can be protected.

### *Environment*

Environment refers to extrinsic factors that affect the agent and the opportunity for exposure. 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.

Opportunities for infection might increase because of overcrowding, unhygienic conditions, a lack of safe drinking water, climate change, insecurity etc. Essential public health or medical services might also have been inadequate before a disaster for instance, and subsequently, disrupted or overwhelmed by the emergency situation as a result of the breakdown of the health infrastructure and displacement of the skilled health workers who might also experience a loss of family, property etc. Large population movement from one malaria epidemic area to another might increase the risk for severe malaria among the displaced as well

as the host population if the malaria species affecting the two populations are somewhat different.

It must be noted that because communicable diseases respect no boundaries, outbreaks occurring within a population or geographical location can spread to another population or location through movement of people, and vice versa. The above risk factors can apply to either population.

The probability of communicable disease outbreaks occurring depends, therefore, on the type of infectious agents existing within the local environment and the population's physical conditions and health status.

A lot of studies that have been done on epidemics indicate that they usually breakout after a disaster (flood, drought, earthquake, civil unrest etc.) (Abdallah & Panjabi, 2008). This conclusion has been drawn as a result of several years of observation by the World Health Organisation (WHO) and other international humanitarian organisations like the International Red Cross and Red Crescent Societies. Most of the epidemic preparedness documents that have been developed therefore are geared towards mitigating the outbreak of epidemics that follow disasters.

Notwithstanding the above general observation, it is also evidently clear that not all epidemics break out after a disaster. Diseases like severe acute respiratory syndrome SARS, H1N1 (swine flu), Ebola etc. did not break out after any disaster. It could also be observed that in Ghana, epidemics do not only breakout after a disaster like floods which is experienced annually, but as a result of poor sanitation of the environment, and unhygienic ways of handling food and

water that are sold outside. It would be realised that most of the filth that is found in the country, especially Accra are around markets and lorry stations. Markets and lorry stations can be said to be interrelated in the sense that, wherever there is a big market, there is always a lorry station and vice versa. These problems of poor sanitation of the environment and unhygienic handling of food and water at lorry stations also facilitate the outbreak and spread of epidemic diseases.

### **Transmission of communicable disease**

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, namely:

- Length of time of exposure;
- Manner of exposure;
- Virulence and number of organisms; and
- State of host defenses

Microorganisms come in the form of bacteria, virus or fungi. Examples of common infectious and causative agents are H1N1, Ebola virus disease, cholera, meningitis etc. The transmission of communicable diseases can be explained with the disease transmission cycle as illustrated in Fig. 4.

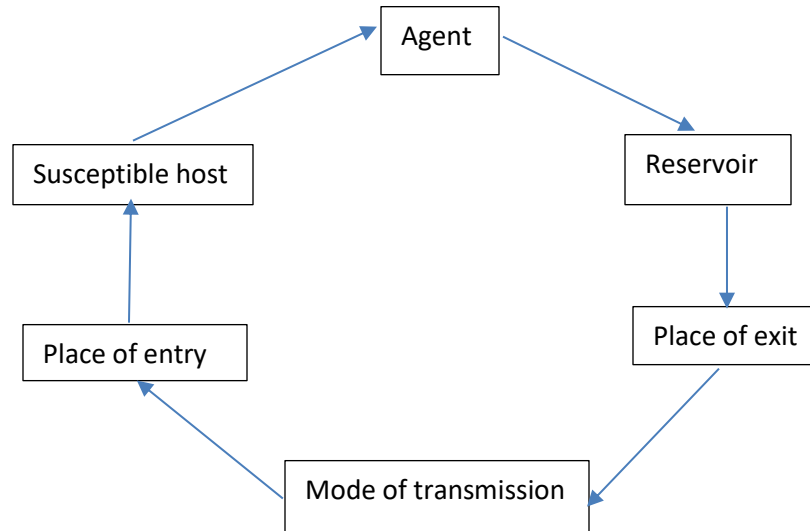


Fig. 4: Disease Transmission Cycle  
Source: Centers for Disease Control and Prevention (2006)

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 & 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, tissue.

Mode of Transmission refers to how the infectious agent leaves the reservoir and enters the susceptible host.

Micro-organisms can be transmitted by 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)

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 include 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, immunocompromised e.g. pregnant women, cancer patients, PLWHA.

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, blocking the agents means of getting from an infected person to a susceptible host, 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. For the 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 PPEs, adherence to good house-keeping and waste management practices.

### **Communicable Diseases of Epidemiologic Importance**

There are several communicable diseases of epidemiology importance that have been identified by the World Health Organisation. Some of these diseases like HIV and hepatitis can be transmitted through sexual intercourse or blood transfusion. There are others like tuberculosis and H1N1 which are airborne and could be transmitted through droplets released into the air in an enclosed area by an infected person's cough or sneeze. Others could also be transmitted through direct contact with an infected person's discharges like vomit, faeces or any body fluid of the infected person. Those communicable diseases that are of relevance to this study are those that are airborne and those that could be transmitted through direct contact or fomites. Furthermore, those that are peculiar to the African continent and Ghana in particular will be the focus of discussion in this study.

### **Cholera**

According to Lamond & Kinyanjui (2012), cholera is a diarrhoeal disease caused by a bacterial infection of the intestine. The bacterium is vibrio cholerae, which can either be type O1 or O139. It can infect both children and adult. Only about 20% of those infected develop acute, watery diarrhea, and of these, between 10%-20% develop severe watery diarrhoea with vomiting. If people are not promptly and adequately treated, the loss of large amount of fluid and salts

through diarrhoea and vomiting can lead to severe dehydration and death within hours. The case fatality rate if untreated may reach 30-50%.

The typical presentation of cholera is a sudden onset of profuse, painless, watery -stools, sometimes like rice-water, often accompanied by vomiting. Dehydration appears within 12-24 hours. The first twenty-hours of cholera manifestation are the riskiest, and if the sufferer is not rehydrated, death can result. Cholera is usually transmitted through faecally contaminated water, hands or food, and remains an ever-present risk in many countries. The greatest risk occurs in over-populated communities, displaced populations and refugee settings, which are characterised by poor sanitation, unsafe drinking water and increased person-to-person contact.

### **Tuberculosis**

Tuberculosis (TB) is an infectious disease caused by the bacillus *Mycobacterium tuberculosis*. It typically affects the lungs (pulmonary TB) but can affect other sites as well (extra-pulmonary TB) (World Health Organization, 2014a). Feske et al. (2011) also explain that, tuberculosis is an airborne disease, known to be transmitted effectively in congregate setting such as hospitals, homeless shelters, naval ships, aircrafts and school buses. The disease is spread in the air when people who are sick with pulmonary TB expel bacteria, for example by coughing. Overall, a relatively small proportion of people infected with *M.tuberculosis* will develop TB disease. However, the probability of developing TB is much higher among people infected with HIV. TB is also common among



men than women, and affects mainly adults in the most economically productive age groups.

### **Ebola virus**

The Ebola virus is said to belong to the Filoviridae family (filovirus). According to the WHO (2014b), the Ebola virus comprises five distinct species which are Bundibugyo, Cote d'Ivoire, Reston, Sudan, and Zaire. The Ebola Zaire, Sudan and Bundibugyo subtypes are said to have been associated with large viral haemorrhagic fever outbreaks characterised by high person-to-person transmission and a case fatality ranging from 25%-90%. On the other hand, Ebola Cote d'Ivoire and Reston subspecies have not been associated with viral haemorrhagic fever outbreaks in humans till date. The Ebola virus was first detected in 1976, and since then it has mostly occurred in sub-Saharan Africa.

### **Meningitis**

The human brain and the spinal cord are protected by a fluid called Cerebrospinal fluid, which the medics call CSF. This fluid which bathes the brain and spinal cord, protecting them from trauma and injury, is an important protection system for the brain and spine. The fluid is encased in a membrane called meninges. Meningitis is basically a disease that causes the meninges membrane to be inflamed. There are many different causes of Meningitis. The more common ones are viruses, bacteria fungi and parasites. The less common causes are cancer, brain surgery and head injuries (Centers for Disease Control and Prevention, 2017).

The infection causes the meninges membrane to swell. It can also cause inflammation of the blood vessels in the brain. Some of the symptoms that are associated with the disease includes headaches, stiff neck, fever, vomiting, rash, confusion, drowsiness chills, cough, chest pains and an immediate dislike for bright light. Pneumococcal meningitis if not treated early can result in death. The simplest way to prevent acquiring Pneumococcal meningitis is to avoid exposure to any nasal, mouth or throat fluids from infected person.

### **H1N1 (Swine flu)**

H1N1, also referred to as swine flu was first detected in the United States of America in April 2009. The virus spread from person-to-person worldwide, and on 11<sup>th</sup> June 2009 the World Health Organisation declared a pandemic of 2009 H1N1 flu. This virus was originally referred to as “swine flu” because laboratory testing showed that many of the gene in the virus were very similar to influenza viruses that normally occur in pigs (swine) in North America. But further study showed that the 2009 H1N1 was different from what normally circulated in North American pigs (Centers for Disease Control and Prevention, 2010). It was said to have two genes from flu viruses that normally circulate in pigs in Europe and Asia bird (avian) genes. Scientists call it ‘quadruple reassortant’ virus.

The 2009 H1N1 virus is contagious and can spread from human to human through coughing, sneezing or talking by people with the influenza. Sometimes people may become infected by touching things such as surfaces or objects that have been contaminated with the flu virus and then touching their mouth or nose.

Symptoms of 2009 H1N1 flu virus in people include fever, cough, sore throat, runny or stuffy nose, body aches, headache, chills and fatigue. (Centers for Disease Control and Prevention, 2010)

### **Chickenpox**

Chickenpox is caused by a virus called varicella zoster. According to the World Health Organisation, the condition is characterized by a rash, and people who develop symptoms of chickenpox can get 250-500 itchy blisters. An infected person is contagious about two days before the rash appears, and then continues being so for another five to seven days or until all the blisters have become scabs. Chickenpox is mostly transmitted by direct contact with the blisters of someone who has the varicella zoster virus, or by breathing in the virus particles from someone's blisters. It can also be transmitted by small particles from the mouth of someone talking or coughing.

### **Transport and Spread of Epidemics**

Transport has generally been identified as a means of spreading communicable diseases. This is because transport allows people to travel from one location to the other and also assist in migration. Apart from that, it has also been empirically observed that some communicable diseases can be spread on public transport. For example, in 1998, there were reports of the spread of tuberculosis on some aircrafts. This 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

standard document on best practices in the airline industry towards the prevention of the spread of tuberculosis and other related communicable diseases. This document was revised in 2006, 2008 and 2012 (WHO, 1998).

Some studies conducted in the road passenger industry globally (Allen, 2015, Feske et al., 2011, Wilson, 1995) indicate that communicable diseases like tuberculosis and common colds or flu can be spread on public vehicles.

### **Preparedness for Communicable Diseases**

Experience has shown that the risk of disease outbreaks and death during epidemics, disasters and complex emergencies might be minimised through early introduction of disease surveillance epidemic preparedness. Preparedness refers to measures taken to prepare for and reduce the effects of epidemics. That is, to predict and-where possible-prevent them, mitigate their impact on vulnerable populations, and to respond to and effectively cope with their consequences (International Federation of Red Cross and Red Crescent Societies, 2000). Prediction and prevention or mitigation can be effective through disease surveillance.

Disease surveillance is the process of being watchful and vigilant for health problems and their determinants with the intention to take measures that will control and prevent disease, and thus improve or maintain the health of the population. Incorporating epidemiological methods into surveillance system enables health personnel to make evidence-based decisions for public health actions (Government of Ghana, Ministry of Health & National Surveillance Unit, 2002). Normally, specific surveillance objectives serve as a guide to policy

makers in line with the selection of useful data that need to be collected to set priorities, plan interventions, mobilise and allocate resources and predict or provide early detection of outbreaks-all strategies for disease control and prevention.

### *Preparedness in the transport industry*

In the air and maritime transport sectors, the issue of transmission of communicable diseases is of paramount importance, since journeys made in these modes are across international frontiers, and involve long travel times. In the maritime transport for example, ship crew are expected to have evidence of immunisation of yellow fever before they are allowed to enter a particular destination country. These cards are inspected by the health authorities in the destination country, and it is only when clearance has been given that the crew will be allowed entry into the town where the port is located.

There is a similar requirement in the air transport industry where all travelers are required to have evidence of immunisation before they are allowed to enter the destination country. Travellers who are suspected of having any signs of communicable diseases are quarantined and thoroughly examined by health authorities in the destination country before they are allowed entry.

In order to prevent the spread of communicable diseases on board aircrafts, all aircrafts are mandated to have a ventilation system where air in the cabins is extracted, goes through effective filtration system and the cabins are refilled with fresh air at thirty minutes interval. The air extracted from the cabins goes through a filtration system to ensure the elimination of any microorganism

before they are reintroduced into the cabins. This filtered air is said to be cleaner than the air in most homes in the developed countries (WHO, 2008). Also, it is a requirement in the air transport industry that where flights are delayed for thirty minutes and above with passengers onboard the aircraft, the ventilation system must be put on to ensure the safety of passengers.

In the road transport industry however, there is no documented standards of preparedness to prevent the spread of communicable diseases on board vehicles both globally and locally. This may be as a result of the general view that journeys involving road transport require shorter travel times and are mostly for internal travels within particular countries. But in the developed countries, where journeys are made across borders screening of passengers are put in place to ensure that communicable diseases are not spread from one country to the other.

Wilson (1995) focused her study on travels and the spread of infectious diseases. She stressed on the fact that movement allows infected persons to carry their infection from the origin location to their destination environment, and depending on the susceptibility of the person in the host community, may spread the infection. Her assertion means that migration and travel facilitate the spread of communicable diseases. However, one notable issue that she identified in her study relates to the vehicle of transportation itself. She emphasised that, during travel, people from diverse origins are enclosed in close proximity for hours or days and then discharged to move on to many distant places. These temporary habitats, (aircrafts, ocean going vessels, trains and road vehicles) she explains, can be the sites for dissemination of the microbes (as for example with food borne

infections and cholera) or provide a milieu for person-to-person transmission (e.g. influenza and tuberculosis).

Feske et al. (2011) also carried out a study on the risk factor of public transport for transmission of tuberculosis in Harris County in Houston in the United States of America. The study found that those who used public transport frequently were at higher risk of acquiring tuberculosis. This was on the basis that buses are unique locations for transmission, in that use is often a part of a person's daily routine and, unlike the work environment; fellow riders remain largely unknown to each other. Such a setting makes it possible for an undiagnosed case to share the same enclosed airspace with persons he would be unable to name in a contact investigation.

At the local level, literature is scarce on the spread of communicable diseases in the road passenger transport sector. Although there have been several studies on epidemic diseases by the Ghana Health Authority and other stakeholders, there is no particular study that has been focused on public vehicles.

## **Theoretical/Conceptual Framework**

### **Health Communication Theory**

“Health communication has been defined as the study and use of methods to inform and influence individual and community decisions that enhance health” (Freimuth, Linnan, & Potter, 2000, p. 2). Communication methods are used to create and increase public awareness of a disease; educate the public about a disease, its causes and treatment; change a person's or group's attitudes about a

disease; change individual behaviour to prevent and control; and create social norms that favour healthful living. Health communication theory utilizes four key elements of the communication process: audience, message, source, and channel. Effective health communication programmes identify segments; deliver accurate, scientifically bases messages from credible sources; and reach audiences through familiar channels.

### The communication process

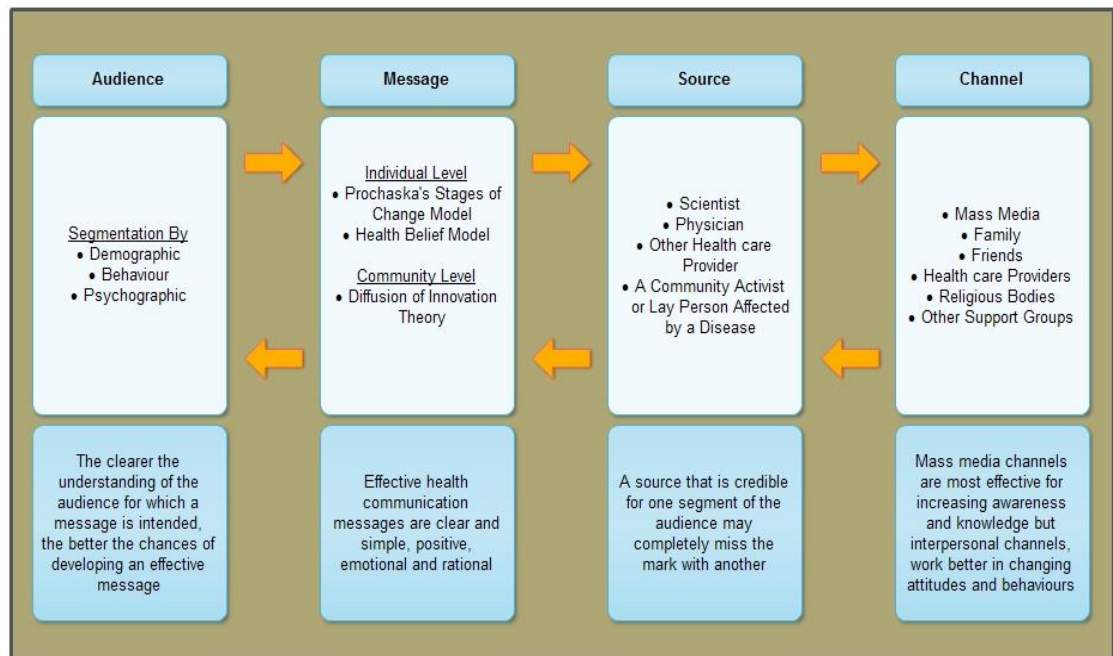


Fig. 5: Conceptual Framework

Source: Own construct adapted from Freimuth, Linnan & Potter (2000)

### *Audience*

Freimuth et al, (2000) explain that understanding the audience for which a message is intended is critical to the communication process. The clearer the understanding of the audience for which a message is intended, the better the



chance of developing an effective message. The audience can be divided into smaller subgroups or segments of similar internal compositions. Audience segmentation allows for more specific and individually tailored message for each subgroup. An audience can be segmented on the basis of any number of criteria: demographics (sex, age, education), behaviour (outdoor activities, food-handling practices, hand-washing); and psychographic characteristics (value, attitudes, life styles).

Once an audience is segmented, the subgroups are carefully assessed (through focus groups, in-depth interviews, demographic and other data) so that appropriate messages, sources, and channels can be formulated, first to inform the subgroup population about a disease problem and then to propose acceptable behaviour changes to prevent disease and promote healthful living.

### *Message*

Effective health communication messages follow some general principles: they are clear and simple, positive, and both emotional and rational; if they arouse fear, they show ways of alleviating the fear; and if they contain motivational appeals, the appeals follow established guidelines likely to produce the expected response.

On the individual or interpersonal level, Freimuth et al. (2000) explains that, effective health communication messages often apply Prochaska's Stages of Change Model and the Health Belief Model to message design. The stages in Prochaska's model are pre-contemplation, contemplation, preparation, action, and maintenance. At the pre-contemplation stage, the individual has not thought of

changing the behavior. At the contemplation stage, an event or a trigger prompts the individual to consider that he/she should change his/her behaviour. The preparation stage is where the individual collects information and assesses his/her skills required to effect the change. He/she will also consider what impact it will have on himself/herself and others. The action stage is where the individual takes appropriate action to change his or her behaviour. At the maintenance stage the individual needs to continuously maintain the new behaviour or he/she will relapse back to the older unhealthy behaviour.

The Health Belief model stipulates that a person's health-related behaviour depends on a person's perception of four critical areas: the severity of potential illness; the person's susceptibility to that illness; benefits of taking preventive action; and the barriers to taking that action. The model incorporates actions as important elements in eliciting or maintaining patterns of behaviour. For example, writing a note to remind oneself to exercise.

On the community or organizational level, the Diffusion of Innovation theory applies. Rogers (2003, p. 5) defines diffusion as "the process in which an innovation is communicated through certain channels over time among the members of a social system". According to this theory, new ideas, products, and social practices follow a pattern as they spread within a society. Key variables include characteristics of innovation itself (relative advantage, compatibility, complexity, observability), communication channels, and social systems (social networks, norms, structures). Rogers explains that the innovation decision goes

through a five stage process namely; (1) knowledge (2) persuasion (3) decision (4) implementation, and (5) confirmation.

Sahin (2006) asserts that at the knowledge stage of the process, an individual learns about the existence of innovation and seeks information about the innovation, and asks critical questions like “what?”, “how?” and “why?”. According to Rogers (2003), the questions form three types of knowledge: (1) awareness-knowledge (2) how-to-knowledge, and principles-knowledge. In the context of this study, the emphasis is on the awareness-knowledge, which represents the knowledge of existence of the innovation (in this case, the spread of communicable diseases on public vehicles). Sahin explains that this type of knowledge can motivate the individual to learn about the innovation and eventually, to adopt it. It also may encourage an individual to learn about the other two types of knowledge.

Reaching culturally diverse groups with messages vital to disease prevention and trying to convince group members to alter behaviours to safeguard their health may sometimes require tools that transcend explanatory language. Explanatory language tends to isolate and fragment, to describe one event followed by another in linear fashion. Figurative language tends to synthesise and combine; it can unite different levels of thought, feelings and behaviour into a holistic picture that gives a rounded perspective; and it draws on such unusual vehicles as culturally specific metaphors, e.g. idiomatic saying or proverbs, stories, or songs that express aspects of folk wisdom in plain but effective terms.

Regardless of the theory and vehicle used, the only way to know if the audience will receive the intended message is to pretest the message with a representative sample of audience.

### *Source*

The source influences the effectiveness of the message. A source that is credible for one segment of the audience may completely miss the mark with another. While a scientist, physician, or other health-care provider may seem the ideal source of public health information a community activist or a lay-person affected by a disease may carry more credibility and have a greater public health impact.

### *Channel*

Even the best-crafted message is useless if it fails to reach the intended audience. The channel, or means by which the message is sent, is as important as the message. Mass media outlets (television, radio, magazines, newspapers, billboards, the internet) provide ample opportunities, as do family, friends, health-care providers, and religious and other support groups. Other means such as telephone hotlines offer an opportunity for interpersonal communication anonymously and across geographic boundaries. Multiple channels can be combined to communicate a message more effectively. Mass media channels are most effective for increasing awareness and knowledge, but interpersonal channels work better in changing attitudes and behaviours. A message delivered

through the mass media can stimulate interpersonal discussions about a health issue.

### **Summary**

This chapter was devoted to literature review in the study area of this research. The key issues that emanated from the literature is that, transport is very vital in the socio-economic development of every nation. However, transport has been identified as a means of spreading some communicable diseases like tuberculosis. But adequate preparedness has helped in preventing the spread of communicable diseases in some sectors of the transport system. Further, preparedness is facilitated by people's awareness of the existence of these communicable disease, and their attitude also play a key role in preventing such diseases. But how do people become aware, and how is this awareness disseminated to other community members? This public awareness is what the study sought to enquire.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### Introduction

The study sought to explore the views of transport operators and passengers of the spread of communicable diseases on public road transport systems. This chapter deals with the methodology adopted for the study. The issues covered include research design, population, sampling procedure, data collection instruments, data collection procedures and data processing and analysis.

#### Research Design

Social Science Research is driven by various philosophical paradigms including ontological issues, that is, the nature of reality; epistemological issues-that is how reality is known; and also methodological issues-that is how data are gathered for a research (O’Gorman & MacIntosh, 2015). The most widely discussed paradigms are however the positivist and interpretivist paradigms (Sarantakos, 1997). The philosophical paradigm that drives a particular research also determines the methods that are used to collect and analyse data for the research. Positivist methods, such as laboratory experiments and survey research are aimed at theory (or hypotheses) testing, while interpretive methods, such as action research and ethnography, are aimed at theory building (Bhattacharjee, 2012).

This study employed the interpretivist research paradigm and the data collection method that was adopted was qualitative in nature. The study also sought to explore the views of road passenger transport organizations and passengers in Ghana on the spread of communicable diseases through their activities. The exploratory and cross sectional study design was therefore considered for the study because the research topic was fairly new in the Ghanaian setting, and also the study was conducted at a point in time.

### **Study Area**

The study was focused on intercity 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 walks of life, both international and national. Accra also has various transport organisations and a variety of transport stations.

Most of the country's amenities and services are centralized in Accra, which results in people travelling from all over the country to Accra to access those amenities or services. Also, although the Kumasi and Tamale airports have been upgraded to international status in recent times, the Kotoka International Airport which is sited in Accra continues to receive more international travellers than the other two. As a result, most international travellers converge in Accra before dispersing to their various destinations. This situation, coupled with internal migration results in a lot of people using public transport on daily basis to and from Accra, and also within the city.

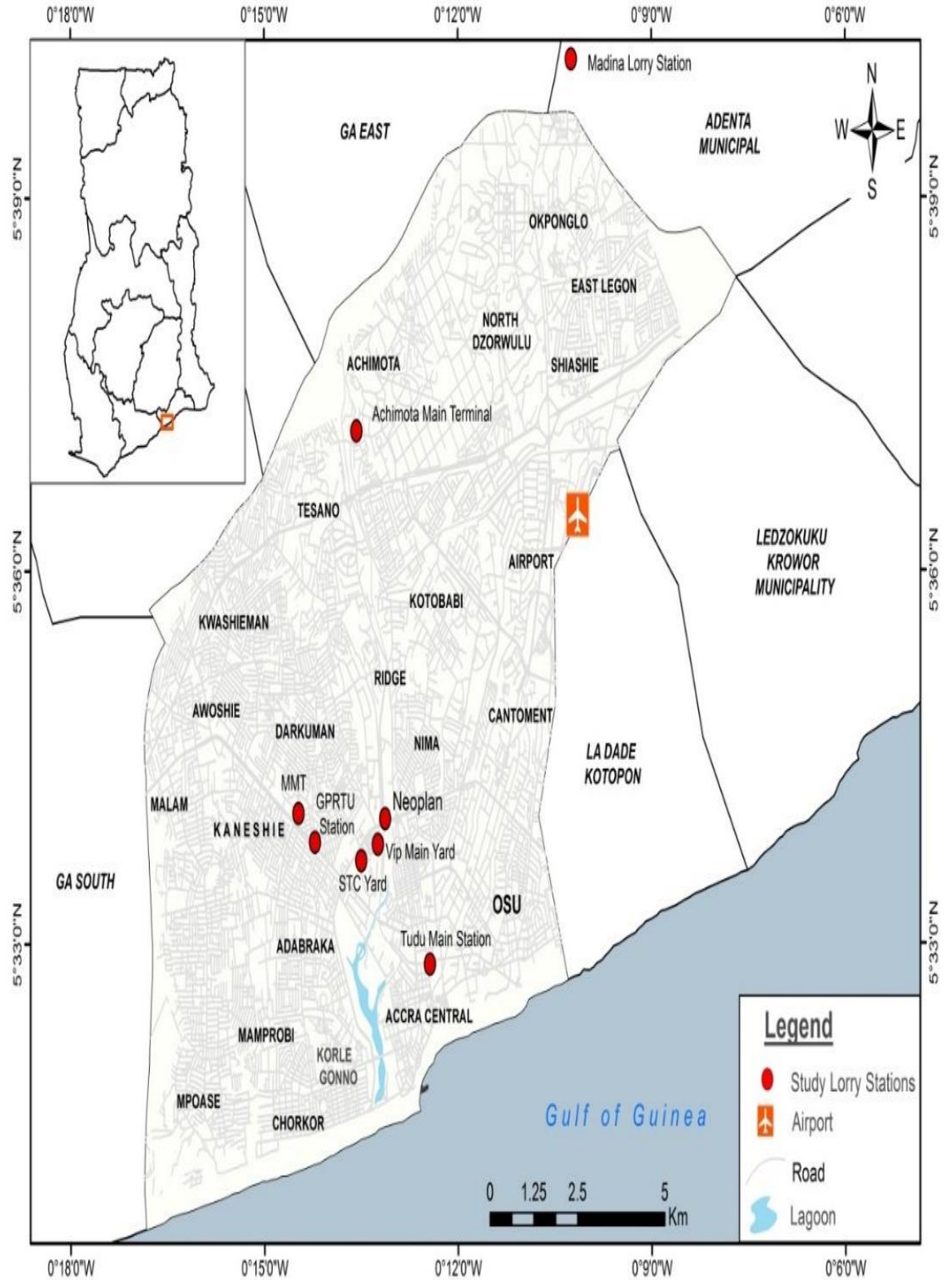


Fig. 6: Map of Study Area

Source: Cartography & Remote Sensing Unit, (2017). Department of Geography and Regional Planning, University of Cape Coast



The city of Accra is a cosmopolitan one and has a total land size of 173km<sup>2</sup>. The boundaries of the city stretch from the Nautical College which is at the outskirts of Nungua township in the east, across to the Mallam Junction and the Lafa Stream in the west. The northern border is marked by the Great Hall of the University of Ghana, and at the southern border is the Gulf of Guinea, (Fig. 6) (Easy Expat, 2016).

The administration of most part of the city is under the jurisdiction of the Accra Metropolitan Assembly. However, other Municipal Assemblies like the Ledzokuku-Krowor Assembly for instance is in charge of the administration of the eastern part of the city. For ease of administrative purposes for the Accra Metropolitan Assembly, the portion of the city that is under their jurisdiction is sub-divided into eleven administrative entities called Sub-Metropolitan areas, which are commonly referred to as “Sub-Metros”. The sub-metros are Ablekuma North, Ablekuma Central, Ablekuma South, Ashiedu Keteke, Ayawaso Central, Ayawaso East, Ayawaso West, La, Okaikoi North, Okaikoi South, and Osu Klottey (The International Bank for Reconstruction and Development/The World Bank, 2010).

According to the 2010 Population and Housing Census, the population of the Accra Metropolitan Assembly is 1,665,086 and that of the Ledzokuku-Krowor Municipal Assembly is 227,932 (Ghana Statistical Service, 2014a). Over the years however, with immigration from the rural areas, the city has expanded without regard to proper zoning, and this has given the city a sprawled attribute (Royal Trips, 2016). Some of the communities at the periphery of the city have

grown to become urbanized, and are unofficially considered part of the city by inhabitants, although technically they are not. One of such urban communities is Madina which is in the La Nkwantanang-Madina Municipality.

The La Nkwantanang-Madina Municipal Assembly was established by Legislative Instrument (L.I. 2030) and inaugurated in June 2012. It was carved out of the Ga East Municipal Assembly. The Assembly has a total land cover of 166km<sup>2</sup>. The capital of the Assembly is Madina (Ministry of Finance, 2015). The population of the Assembly, according to the 2010 Population and Housing Census is 111,926 (Ghana Statistical Service, 2014b). Most of the stations (7 out of 8) chosen for the study were located within the Accra Metropolitan Assembly, with the remaining one in the La Nkwantanang-Madina Municipality.

### **Population**

The city of Accra has many public commercial transport organisations, who move tens of thousands of passengers to and from the city on daily basis. Travellers to and from Accra are made up of people from different racial and ethnic backgrounds. Children, youth, adults, and the aged are all moved by public transport on daily basis to and from Accra. Also, people who engage in all manner of occupations use the services of public transport in Accra on daily basis. The operators of public transport in Accra is also made up of people from different ethnic, racial, educational and religious backgrounds. However, the laws of Ghana allow only people who are more than eighteen years to drive vehicles, especially those that are used for commercial purposes. The characteristics of the population for this study therefore were many and varied, and could be classified as infinite

population as asserted by Nsowah-Nuamah (2005). However only people who were eighteen years and above and were considered matured were those interviewed for the study.

The study population, therefore, comprised all transport operators, which were made up of the leadership of the various transport organisations and their drivers, as well as the passengers who patronise the services of these transport providers. The target population however, was the intercity transport operators and passengers who patronize such services. These categories of persons were chosen because of their relevance to the research topic. In the first place, operators are the ones who provide transport services to the public, and they engage in regular interaction with the travelling public both at the station and on the vehicles. They are therefore vulnerable as far as the spread of communicable diseases is concerned. On the other hand, passengers are those who use the services of the operators, and they usually congregate at the various stations where they interact with each other either formally or informally. This makes them more vulnerable than even the operators.

### **Sampling Procedure**

According to Degu and Yigzaw (2006), sampling involves the selection of a number of study units from a defined study population. Many authors argue that, whereas representativeness is the goal of quantitative research, the same cannot be said about qualitative research. Neuman (2011) for instance explains that although accurate sampling frame is crucial in a research, the size of a sample is less important than how accurately it represents the population. Sarantakos

(1997) on the other hand argues that the quality of data in a research is more important than representativeness. In effect, it is not the size of a sample per se that is important in a research but how well the sample is selected.

In the context of this study however, a total of 80 respondents were interviewed, and this comprised passengers and operators (drivers, conductors, station masters, bookmen, point officers etc.). Three qualitative sampling methods were employed for the selection of respondents for the study. In the first place, quota sampling method was used to determine the number of respondents that were selected from each category. Passengers formed the greater percentage of the study population and therefore 60% of the sample size was allocated to this category. The next was the driver category and they were allocated 30% of the sample size. The remaining 10% of the sample size was allocated to the leadership of the various transport organisations. The award of these percentages (quotas) to the categories was based on the fact that there was no sampling frame for the respondents, and if proportional was employed, some of the categories would be underrepresented. However, looking at the characteristics of the population, it was realised that each station had one station master who controlled a number of drivers, depending on the number of vehicles operating at that particular station. Also, most vehicles carried an average of 22 passengers on every trip, making passengers the category with the highest proportion.

Accidental sampling method was then employed to select the required number from the driver and passenger categories of respondents at each station, whereas purposive sampling was used for selecting respondents from the

leadership category. The composition of the sample selected for the study is shown in Table 1. The main disadvantage of these sampling methods are their non-representativeness, and the inability to generalise. Notwithstanding these disadvantages, they are very convenient and cost effective. The accidental and purposive sampling methods were the most appropriate sampling methods that could have been used for selecting the respondents, considering the nature of the study, and the characteristic of the study population as well.

**Table 1: Sample Size of categories**

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

Source: Fieldwork, December 2016 (Intercity travels only)

### **Data Collection Instruments**

In-Depth Interviews (IDIs) and observation were the main data collection methods used for the study. According to Cohen, Manion and Morrison (2007), interviews enable participants-be they interviewers or interviewees-to discuss

their interpretations of the world in which they live, and to express how they regard situations from their own point of view. In the sense of the above, the interview is not simply concerned with collecting data about life: it is part of life itself, and its human embeddedness is inescapable. The interviews allowed for flexibility in the data collection, enabling multi-sensory channels to be used: verbal, non-verbal, spoken and heard.

The interview guide which was used for data collection for this study was developed based on the objectives and their corresponding research questions. The guide was structured into six sections with each section devoted to one of the objectives of the study. Section A dealt with the demographic issues, whereas sections B to F dealt with the research objectives. In all, there were twenty-five items each for drivers and passengers and twenty-six for the leadership included in sections B to F, and all the items were meant to explore the views of respondent on the research topic. Apart from a few questions in sections B and F which were specifically directed at the various categories, all other questions in all the sections for all three categories of respondents were the same. This was because, apart from the few specific questions which sought to elicits some specific issues related to the various categories, all the other questions sought to explore the views of respondents on the same general issues on the transmission of some communicable diseases on the public road transport system.

To ensure content and construct validity, vague questions and also questions that did not relate to the research topic were avoided. Also, during the interview, the responses were repeated to the respondents for them to confirm or

modify. This was done to ensure that the respondents understood the issues very well.

To complement the data from the interviews, a list of items was put on a checklist which were observed on the vehicles and in the station environment. In the station environment, the state of refuse collection, availability of place of convenience (washrooms) and who owns and operates the washrooms, whether passengers use 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. 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. Observations also allows the researcher to see at firsthand, what exists or transpires in a particular setting or environment (Cohen et al., 2007)

### **Pre Testing**

Both the interview guide and the observation checklist were tested with a few respondents at the Kimbu Terminal of the Metro Mass Transit and the Kimbu Lorry Station of Global Millennium Transport Association. The pre-testing took place on 29<sup>th</sup> September 2016, and a total of eight respondents made up of a ticket attendant/secretary, three drivers and four passengers were interviewed. The number of respondents interviewed for the testing of the interview guide formed 10% of the sample size for the main study. Some observation on type of vehicles used for operations, cleanliness, both at the stations and on the vehicles, as well as facilities for sanitation at the station was carried out. The data collected was

analysed and the results informed the finalization of both the interview guide and the observation checklist. An advantage of conducting pilot testing of data collection instruments is that it might give advance warning about where the main study could fail, where research protocols may not be followed or whether proposed methods or instruments are inappropriate or too complicated.

### **Data Collection Procedures**

In depth interviews (IDI's) were conducted for all respondents at the station. The respondents were those travellers and operators/drivers who were willing to take part in the study. The purpose of the study was explained to them before the interviews were done. The interviews lasted for an average time of 30 minutes. Observation was also carried out to ascertain sanitation at the stations, cleanliness of the interior of the vehicles, type of vehicles used for operations and the construction of seats in the vehicles. At every station, permission was first sought from the person in charge of the station to conduct the study, and that person was interviewed first (that is if he/she was willing to be interviewed) before other respondents at the station were also interviewed. In situations where the person in charge was not willing to be interviewed, he/she was replaced by any other officer who was willing to be interviewed.

For driver respondents, only those who were waiting for their turn to load and who were willing to be part of the study were interviewed. Audio recording of the interviews was made but short notes was also taken to supplement the audio recording. The interviews were conducted at the station while the respondents were waiting either at the waiting area of the station or on the vehicles for the



journey to start. The purpose of the study was thoroughly explained to each respondent and their consent to take part was sought before the interview was done. In some cases, the responses were repeated to the respondents for them to confirm whether that was exactly what they meant to put across. During the interviews, some drivers and passengers declined to talk to us because they thought it was a waste of their time. Some also demanded money from us before they would take part in the interview. Some of the people approached even used abusive language which was provocative, but we were able to contain them. In some cases, respondents did not allow us to record their voices, as a result we only had to depend on the field notes and this prolonged the interview a bit.

### **Ethical Consideration**

Ethics in Social Science Research is of paramount importance, especially where human subjects are involved. Some of the ethical considerations in social research are harmlessness, informed consent, and anonymity and confidentiality. (Bhattacharjee, 2012; Cohen et al., 2007). A clearance was therefore sought from the Institutional Review Board (IRB) of the University of Cape Coast before the data collection was done. It was ensured that all the requirements, as stipulated in the IRB were adhered to. The most important of the requirements were harmlessness, informed consent, and anonymity and confidentiality.

### **Data Processing and Analysis**

The audio recordings that were made during the field interviews were transcribed in addition to the field notes that were taken. The questions and

responses from each respondent was put in a tabular form and the transcript was analysed manually by looking for similar responses, which were put together to form themes that were used to explain respondents' views. These themes were based on the objectives of the study and their corresponding research questions which translated into the questions that were asked during the field interview. The themes that emanated from the responses were carefully analysed to conform to the research questions to ensure that the various research objectives were met. The unit of analysis for the study was the individual respondents (station masters, bookmen, drivers, passengers etc.) and the vehicles as well as the stations. The themes that emanated from the manually analysed responses were used as findings. For the demographic characteristics of respondents, descriptive statistics were used to describe them.

### **Summary**

This chapter looked at the methodology employed for the study. Generally, the interpretivist research paradigm was adopted for the study. The exploratory research design was followed. Qualitative strategy for data collection which is the strategy used mostly for data collection in an interpretivist research paradigm was used. However, some descriptive statistical methods were employed for the analysis of the demographic characteristics of respondents. The Conceptual Framework applied for the study informed the segmentation of the respondents into the three categories. Finally, because the study sought to explore the views of respondents on the research topic, in-depth interviews was the

method used for data collection. This was however supplemented with observation of some key issues and facilities at each station.

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### **Introduction**

The study sought to solicit the views of vehicle operators and passengers on the spread of communicable diseases through the public road transport system in Accra, Ghana. The views sought included how the respondents perceive the transmission of communicable diseases especially on board a vehicle and at the station, and the risk involved in using public transport, what their reaction will be towards suspected infected people, and ways of prevention. Qualitative methods in the form of in-depth interviews was used to collect data from a sample of eighty (80) respondents made up of the leadership of the various transport stations, drivers and passengers. This sample was selected through quota system and the respondents were purposively and accidentally drawn from eight (8) lorry stations, mostly within the Accra Metropolitan Assembly and one in the La Nkwantanan Madina Municipal Assembly.

The composition of the respondents was 48 passengers, 24 drivers and eight (8) in management positions in intercity operations. In addition to the in-depth interviews, observation was used to collect data on the type of buses used, including the arrangement of seats, ventilation and the cleanliness of the interior of the buses. Sanitation facilities at the stations including washrooms and their cleanliness, running water for hand washing, and refuse management were also observed. The results and discussion are presented in the sections below.

## **Results from Observation**

In all, eight transport terminals or lorry stations were involved in the study. These stations were the Achimota Bus Terminal, Intercity STC Coaches Limited Yard, Accra VIP Yard, Kaneshie Market Lorry station, Kaneshie Metro Mass Transit (MMT) Station, Circle Neoplan Station, Tudu Main Lorry Station and the Madina Main Lorry Station, all in Accra. The environment of the various stations involved in the study differed from one place to the other and thus this section seeks to provide detailed description of the stations visited during the study.

### **Achimota bus terminal**

The Achimota Bus terminal is one of the best state-of-the-art lorry stations in the country as it had good wash rooms with running water and soap for hand washing, a huge collection of waste bins placed at vantage points at the station, a clinic, a police post, and hygienically good canteen amongst others. The station was neat and had a very clean and serene environment with waiting areas for passengers (Plates 1A and 1B). The operators of the bus terminal were in charge of general sanitary conditions at the station and thus, they employed people to make sure the place was kept very neat. Buses, mini-buses, sprinters, 207 buses and taxis were some types of vehicle used for operations at the station. On the average, vehicles at this station usually had passenger capacity of 23 with a driver. Interior cleanliness of vehicles was done by drivers or their mates. Vehicles also had a seating arrangement of five seats and carry four passengers in

a row. It was observed that there was very good ventilation on station vehicles. A few buses had air conditions installed, but the majority did not.



1A



1B

Plates 1A and 1B: Achimota Terminal provided with waste bins at vantage points  
Source: Fieldwork, December 2016

### **Intercity STC Coaches Limited yard**

The Intercity STC Coaches Company Limited Yard (STC YARD) had a very clean and serene environment with good looking buses, a waiting area for passengers, a lot of waste bins and washrooms. The waste bins were placed strategically at convenient locations all over the transport yard for collection of refuse and it was observed that refuse collection was well managed by STC workers in the sense that there was no overflowing of refuse at the station. There were also places of convenience/washrooms being well managed and owned by the STC bus operators at free disposal to passengers. The washrooms were observed to be clean and we were informed that general sanitary conditions and cleaning of the station and the washrooms was done by cleaners employed by the

STC bus operators. There was also soap and running water for hand washing at the various washrooms. The general passenger capacity of vehicles being used at the STC Yard were 48 and 26, and the interior cleanliness of vehicles was done by workers employed by the STC (Plates 2A and 2B). All the four buses observed had very clean interior and seats. Seats on the buses observed at STC were arranged to take five passengers on a row, but by their standards, STC allowed only four passengers to sit on a row irrespective of seat arrangement, thus making their buses quite spacious and comfortable. All buses had air-conditions installed on them.



2A



2B

Plates 2A and 2B: Intercity STC Coaches Limited Yard  
Source: Fieldwork December 2016

### **VIP Jeoun yard**

Another station visited was the VIP Yard where the story was no different from the STC bus terminal. This station was clean, had a waiting area for passengers and had a collection of steady and good looking buses. It was observed that there were quite a large number of waste bins at strategic locations all over the station as well as wash rooms being owned and managed by the VIP Bus

operators, (Plates 3A and 3B). General cleaning and sanitary conditions of the station environment as well as its washrooms was done by workers employed by VIP bus operators specifically for that purpose. The use of the washrooms was not free as passengers had to make a token payment before using the place. VIP buses had vehicle capacity of 48 and 26 and the station also employed people who were in charge of cleaning both the interior and exterior of the buses and these people had the responsibility of ensuring that the buses were clean at all times. It was observed here also that all VIP buses had air-conditions.



3A



3B

Plates 3A and 3B: VIP Jeoun Transport waiting area and main yard  
Source: Fieldwork December 2016

### **Circle Neoplan station**

The Circle Neoplan Station can be described as one of the busiest transport terminals in Accra. It had a very crowded, dusty and dirty environment. Owing to the unavailability of waste bins for the collection of refuse, garbage could be seen everywhere at this station (Plate 4A and 4B). Washrooms could be found on the premises though they were not very clean. Passengers and other



individuals had to pay for using these washrooms. Buses as well as mini-buses with passenger capacity of 48 and 22 depending on the type of vehicle as well as seating arrangement of four passengers in a row could be found at this station. Interior cleanliness of vehicles at this station was either undertaken by drivers or their mates. At the time of data collection, the place was under reconstruction as part of the construction of the Kwame Nkrumah Interchange. This had compounded the unsanitary condition at the station.



4A



4B

Plates 4A and 4B: Circle Neoplan Station  
Source: Fieldwork December 2016

### **Kaneshie market station**

The Kaneshie market station is also one of the largest but unkempt-looking transport terminals in Accra. Two big waste bins were located in front of the public toilet but one of the bins was full and on the verge of overflowing (Plates 5A and 5B). Apart from these two bins, none other was available at vantage points so refuse was scattered all over the place. Wash rooms were available but were privately owned by individuals who ran it as business entities.

One had to pay a fee before one could use the place. These washrooms were being poorly managed thus they were not clean. Generally, the station was untidy and very dusty. Mini-buses were the main type of vehicle one could find at the Kaneshie Market Station and such vehicles usually had a passenger capacity of 22 plus one driver. Interior cleanliness of vehicles was done by drivers or mates. In all, vehicles had some form of ventilation.



5A



5B

Plates 5A and 5B: Kaneshie Market Lorry Station with refuse scattered all over  
Source: Fieldwork December 2016

### **Metro Mass station**

Kaneshie Metro Mass Transit Station (MMT) was part of the study and this station also had a very dirty and crowded environment (Plates 6A and 6B). There was no properly constructed waiting area for passengers as they had to stand in a queue without any shade whilst waiting for buses to convey them to their destinations. There were no waste bins and the available wash rooms were privately owned and situated at a distance from the station. Thus one had to pay a fee before using the facility though they were not quite clean. These washrooms

had no soap and running water for hand washing. Buses were the only type of vehicles one could find at MMT and such buses had capacities of 47/55/63 passengers plus one driver. Interior cleanliness of vehicles was done by conductors or cleaners employed by the company. The buses also had a seating arrangement of five passengers in a row. It had good ventilation as the buses were equipped with large windows which were easy and safe to open as and when needed.



6A



6B

Plates 6A and 6B: Kaneshie Metro Mass Transit Station by the road side  
Source: Fieldwork December 2016

### **Tudu main station**

The Tudu Main lorry station had a very similar story as some of the other stations as it had a very dusty and dirty environment. Refuse was scattered about due to unavailability of waste bins for the collection of refuse (Plates 7A and 7B). Privately owned washrooms could be found on the premises of this station and so passengers and other individuals had to pay for using these washrooms. However, soap and running water for hand washing could not be found at these washrooms.

Buses as well as mini-buses with passenger capacity of 22 and 18 depending on the type of vehicle as well as seating arrangement were used. Interior cleanliness of vehicles at this station was either undertaken by drivers or mates. Vehicles at this station had some form of ventilation.



7A



7B

Plates 7A and 7B: Tudu Main Lorry Station  
Source: Fieldwork December 2016

### **Madina main lorry station**

The Madina main lorry station depicted another picture all together, as it was observed that it had a noisy, dusty and untidy environment (Plates 8A and 8B). Dustbins were unavailable but refuse collection was done solely by a waste management company by the name Zoomlion. Washrooms were available but they were owned by private individuals. Individuals and passengers could only use these washrooms at a fee. There was no soap and running water for hand washing at these washrooms but we were informed that the operators themselves were responsible for cleaning these washrooms. Generally, cleaning of the station

was done by women cleaners employed solely for the purpose of ensuring good sanitary conditions at the station.

The type of buses found at the Madina Station included buses and mini-buses with seating capacity of 25 inclusive of a driver with or without a driver's mate. Cleaning of these commercial vehicles was normally undertaken by the driver's mate. Seat arrangements on such vehicles were six seats and four passengers in a row. Most vehicles at this station did not have air conditions installed on them but had enough windows to allow fresh air into the vehicles.



8A



8B

Plates 8a and 8b: Madina Main Lorry Station  
Source: Fieldwork December 2016

### **Demographic Characteristics of Respondents**

This section provides findings on the profile of respondents who were interviewed. The relevance of this section to the study is to identify some important indicators such as age, sex, educational level, religious affiliation and

marital status of the respondents with respect to their opinion on the spread of communicable diseases on public road transport systems.

### Sex distribution of respondents

The leadership and driver categories of respondents were dominated by males (Table 2). This was because the road passenger transport sector in Ghana is highly dominated by males. Only a few females operate or drive commercial vehicles in Ghana. On the other hand, the passenger category of respondents was dominated by females. The total number of passengers interacted with was 48. Out of these passengers, majority (60.4%) were females. However, in all, females constituted 36.3% of the total sample of respondents, whereas the male respondents constituted 63.7%.

**Table 2: Sex Distribution of Respondents**

Sex	Categories					
	Leadership		Drivers		Passengers	
	No	%	No	%	No	%
Male	8	100	24	100	19	39.6
Female	0	0	0	0	29	60.4
<b>Total</b>	<b>8</b>	<b>100</b>	<b>24</b>	<b>100</b>	<b>48</b>	<b>100</b>

Source: Fieldwork, December 2016

### Age distribution of respondents

Table 3 shows the age distribution of respondents. The leadership constituted 8 people with their ages ranging from 40 to over 60 years. While 62.5 percent of them were aged 40 to 49 years, the remaining 37.5 percent were 60

years and above. The age distribution indicates that all the leaders were mature and had gained some level of experience in the transport sector.

A total of twenty-four (24) respondents were captured in the driver category for the exercise. The data gathered also showed that the age group of the drivers were varied, ranging from 30 years to over 60 years. The age group with the highest respondents (45.8%) was 40 – 49 years. This was followed by 29 percent who fell within the 30 – 39 years’ bracket, with, 20.8 percent between the age bracket of 50 and 59 years.

The age distribution of the passengers ranged from 18 to 59 years. From the data, the age bracket with the highest number of respondents (41.7%) was 30 – 39 years. This was followed by 40 – 49 years with 29.2 percent of respondents. Respondents who were between 18 and 29 years constituted 18.8 percent while the highest age group (50 – 59 years) constituted 10.4 percent of the passengers.

**Table 3: Age Distribution of Respondents**

Age	Categories					
	Leadership		Drivers		Passengers	
	No	%	No	%	No	%
18 - 29	0	0	0	0	9	18.8
30 - 39	0	0	7	29.2	20	41.7
40 - 49	5	62.5	11	45.8	14	29.2
50 - 59	0	0	5	20.8	5	10.4
60+	3	37.5	1	4.2	0	0
<b>Total</b>	<b>8</b>	<b>100</b>	<b>24</b>	<b>100</b>	<b>48</b>	<b>100</b>

Source: Fieldwork, December 2016

### Respondents' occupation

The positions of respondents in the leadership category varied from bookman to transport manager. The data showed that 37.5 percent of the leadership interviewed were bookmen and this position forms the least among the leadership role in this study. One fourth (25%) each were transport managers and point officers whereas 12.5 percent of the leadership were traffic managers. Some of these leaders were professional drivers before ascending to leadership positions. The other occupation as shown in Table 4 comprised the leadership and driver categories.

With respect to the occupational status of the passengers, it was noted that majority (52.1%) of the passengers were traders / business operators, 12.5 percent were artisans, 16.7 percent were public servants and 1 (2.1%) was a graphic designer. Meanwhile, 14.6 percent of the respondents were still schooling and the remaining 2.1 percent pensioners.

**Table 4: Occupation of Respondents**

Occupation	Categories					
	Leadership		Drivers		Passengers	
	No	%	No	%	No	%
Student	0	0	0	0	7	14.6
Civil/Public Servant	0	0	0	0	8	16.7
Trader	0	0	0	0	15	31.3
Businessman	0	0	0	0	10	20.8
Others	8	100	24	100	8	16.6
<b>Total</b>	<b>8</b>	<b>100</b>	<b>24</b>	<b>100</b>	<b>48</b>	<b>100</b>

Source: Fieldwork, December 2016



### Educational background of respondents

Two main educational levels were recorded for the leadership; Middle School Leaving Certificate (MSLC) and Tertiary. Fifty percent each had attained the Tertiary level and MSCL (Table 5). Indeed, the educational attainment of the drivers was generally low as most of them (91.7%) had attained only up to the Middle School Leaving Certificate Level. Just 8.3 percent had attained the Secondary level at the time of the study.

All the 48 respondents from the passenger category had had some form of formal education from Primary to the Tertiary level. Close to 40 percent of the respondents had up to the secondary level followed by 27.1 percent who had attained degree/diploma at the tertiary level. Almost 23 percent were only enrolled up to the primary level while only 2.1 percent got to the MSCL / JHS Level.

**Table 5: Educational Background of Respondents**

Education	Categories					
	Leadership		Drivers		Passengers	
	No	%	No	%	No	%
Basic	4	50	22	91.7	12	25
Secondary	0	0	2	8.3	19	39.6
Vocational or Technical	0	0	0	0	4	8.3
Tertiary	4	50	0	0	13	27.1
<b>Total</b>	<b>8</b>	<b>100</b>	<b>24</b>	<b>100</b>	<b>48</b>	<b>100</b>

Source: Fieldwork, December 2016

### Marital status of respondents

All the drivers and leaders interviewed at the various stations were married. The data on marital status of passengers however indicated that a vast majority (70.8%) of the respondents were married whereas 18.8 percent were single. A few of them were separated (8.3%) and one was widowed (2.1%), Table 6.

**Table 6: Marital Status of Respondents**

Marital Status	Categories					
	Leadership		Drivers		Passengers	
	No	%	No	%	No	%
Single	0	0	0	0	9	18.8
Married	8	100	24	100	34	70.8
Divorced	0	0	0	0	0	0
Separated	0	0	0	0	4	8.3
Widow/Widower	0	0	0	0	1	2.1
<b>Total</b>	<b>8</b>	<b>100</b>	<b>24</b>	<b>100</b>	<b>48</b>	<b>100</b>

Source: Fieldwork, December 2016

### Religious affiliation of respondents

Apart from one person who was a Muslim in the leadership category, the remaining were all Christians (87.5%). All the drivers interviewed also indicated that they were Christians (Table 7). With the passenger respondents interviewed, most of them were Christians (87.5%) while the remaining were Muslims (12.5%).

**Table 7: Religious Affiliation of Respondents**

Religion	Categories					
	Leadership		Drivers		Passengers	
	No	%	No	%	No	%
Christian	7	87.5	24	100	42	87.5
Muslim	1	12.5	0	0	6	12.5
<b>Total</b>	<b>8</b>	<b>100</b>	<b>24</b>	<b>100</b>	<b>48</b>	<b>100</b>

Source: Fieldwork, December 2016

### **Background of Terminals Surveyed**

The Transport Terminals or stations involved in this exercise included the following; Kaneshie Market, Kaneshie Metro Mass Transit (MMT), Intercity STC Coaches Yard, VIP Yard, Circle Neoplan Station, Tudu Main Lorry Station, Achimota Bus Terminal and Madina Main Station, and only those engaged in intercity travels were interviewed. Interviewees for this section ranged from Traffic Managers, Transport Managers and Bookmen to Point Officers making up some leadership positions at the various stations. It could be deduced from the data collated that vehicular operations from these stations on daily basis varied from each other depending on destination and its affiliated station. For instance, on the average, 40-buses, 10- coaches and 10-mini-buses operate on a daily basis from the STC bus terminal; 30-40 buses from the VIP station; 60-80 buses from the Madina main lorry station; 30-40 buses from the Achimota Bus terminal, 10-15 buses from Kaneshie market lorry station; and 10-15 buses from Kaneshie MMT station.

On the whole, from the interview guide, most leaders had had considerable years of experience in the transport business and thus had had numerous encounters with people from all walks of life.

Further, from the eight main stations surveyed, all respondents for the driver category were drivers of commercial vehicles. These drivers had their routes varying from each other depending on stations /terminals one is affiliated to. It was deduced from the data collated that drivers from these transport terminals usually plied the routes from Accra to Mampong, Koforidua, Oda, Ho, Aflao, Apam, Elmina, Mankessim, Cape-Coast, Takoradi, Obuasi, Kumasi, Sunyani, Dunkwa, Techiman, Tamale, Bolgatanga, Lagos and Abidjan.

The data showed that most drivers had considerable years of experience as commercial vehicle drivers with the highest being thirty-four years and the least experienced having eight years. Most of the respondents however had over twenty years working experience in driving commercial vehicles and thus, had the opportunity of encountering numerous people on daily basis in the transport business.

Responses on how often passengers use public transport varied from very often, daily, monthly to three to four times in a year depending on the purpose of the journey being undertaken. Some respondents, especially females, use public transport mainly for business purposes whilst others use it because they believe it is a more convenient and cheaper means of transport in enabling them to move from one place to the other for visiting family members and friends as well as attending school. The travel time of respondents' journeys (drivers and

passengers) as recorded from the interviews, also depended on the distance from Accra to the destinations, as well as the traffic situation on the route used for the journey.

### **General views (knowledge) on communicable diseases**

Most (7 out of 8) respondents from the leadership category described communicable diseases as infectious diseases that are transmitted from one person to another through direct or indirect contact. Others also described it as air-borne diseases that can be transmitted through the air.

On the question of what they knew about communicable diseases, Tuberculosis (TB), Flu, Measles, Hepatitis B, cholera, Ebola and HIV/AIDS were the examples of communicable diseases given by these interviewees. They stated that infections like flu could spread from person to person when droplets from cough or a sneeze from the infected person move through the air and people breathe in the polluted air. Physical body contact with infected persons could also result in transmission of diseases like Ebola, cholera, measles, and Hepatitis B. Most (6 out of 8) respondents made mention of having heard of Ebola outbreak last year but a few insisted that they had never heard of an outbreak of communicable diseases.

On the part of driver respondents, when they were asked to explain what communicable diseases are, their responses showed that they had considerable knowledge about it. They described communicable diseases as air-borne diseases, transmitted by physical contact with infected person. Others also described it as diseases that can be transmitted through air or body contact.

Examples of communicable diseases that were mentioned by the driver respondents were similar to those mentioned by respondents from the leadership. Hepatitis A & C, ‘Apollo’, Chicken pox, and Influenza were additional examples given by driver respondents. They were also able to tell how these diseases could be transmitted. Infections like flu and Tuberculosis could spread from person to person when droplets from cough or sneeze from the infected person move through the air and get into the nose or mouth of person nearby. Physical body contact with infected persons could also result in transmission of diseases like Ebola, Cholera, Measles, Chicken pox, Hepatitis A,B,C and HIV/AIDS.

Despite the rich knowledge the interviewees seem to have about communicable diseases and how they are transmitted, most (75%) of the driver respondents either did not know or had any idea of the last time they had heard of an outbreak of these communicable diseases. Only a few (25%) respondents made mention of having heard of Ebola outbreak last year in some parts of Africa.

Generally, respondents from the passenger category also had fair knowledge of what communicable diseases are since all could describe what it is. Most described communicable diseases as diseases which are transmitted by physical contact with infected persons as well as being air-borne. Others also described it as diseases that are transmitted through the air or body contact. All respondents gave their own version of what communicable diseases are but the outstanding amongst all came from a 59-year-old male passenger. According to him:

*A communicable disease is an infectious disease transmissible (as from person to person) by direct contact with an infected individual or the individual's discharges, or by indirect means (as by a vector).*

Some additional examples of communicable diseases given by the passenger respondents include common colds, ringworm, and gonorrhoea. They were all of the view that communicable diseases spread through the air or by means of physical bodily contact with an infected person. Although some claimed they had never heard nor knew of the last time there was an outbreak of any of such communicable diseases, others insisted that they had heard of an outbreak only last year.

#### **Awareness of spread of communicable diseases on public road transport system**

All respondents in the leadership category were of the view that communicable diseases could be transmitted on public road transport systems because of the crowded and dusty nature of our stations, and also the fact that there is 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. Covering of the nose and mouth when sneezing, avoiding sharing of objects and regular vaccination were given as some conditions which could help reduce the spread of communicable diseases. Other respondents also believed that provision of isolation seats for infectious passengers or even isolating infected persons from

coming into contact with others could result in reducing the spread of communicable diseases.

Respondents also reiterated that henceforth, they would feel very conscious of themselves and their environment as they would be at risk of contracting an infection. but they indicated that, they will take antibiotics and wash their hands after every journey made, when posed with the question of what their reaction would be if anybody argued that communicable diseases could not be spread on public transport because they already know of the dangers associated with being in close proximity with infected persons.

In the driver category, four respondents refused to take part in this particular section of the interview as they claimed they had no idea of what to say when questions were posed to them. With the exception of these four, all other respondents were of the view that communicable diseases could be transmitted on public road transport systems. They went further to state that because of the confined nature of vehicles and as a result of commercialisation, seating arrangements are close to each other and thus, one is required to sit close to another resulting in sharing of common space and direct physical contact, which could eventually lead to the spread of communicable diseases if an infected person is on the bus. A 27-year-old driver responding to the question as to whether it is possible for communicable diseases to spread on the public road transport system said thus:

*In the transport environment as I said earlier, tuberculosis for example could be spread on a vehicle. TB, I know 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.*

Covering of the nose and mouth when sneezing, avoiding sharing of objects and regular vaccination were given as some conditions which could help reduce the spread of communicable diseases. Other respondents also believed that provision of isolation seat for infectious passengers on commercial vehicles could result in reducing the spread of communicable diseases.

Another set of respondents from the driver category were of the view that not allowing persons with infections to board commercial vehicles could prevent others from getting it. Indeed, most respondents (83%) were of the view that contaminated water supply, poor sanitary facilities, contaminated food as well as the climate were the conditions which could contribute to the spread of communicable diseases on public road transport systems.

In responding to how they would feel if anybody argued that communicable diseases cannot spread on the transport system, most (75%) of the driver respondents said they would feel irritated, angered, annoyed, upset or even worried at such argument. They however said they would carefully explain to anybody who argued on the contrary why they think it is possible for some disease to spread on the transport system.

Most (85%) respondents in the passenger category believed that communicable diseases could be transmitted on public road transport systems

basically because the seating arrangements on these commercial vehicles put passengers very close to one another, thus bringing about physical body contact with others. Again, they believed that the confined nature of the commercial vehicles easily leads to the air on such buses being contaminated when there is an infected person with an air-borne disease on board these vehicles. This assertion was elaborated by a 45-year-old male passenger who indicated that he has been using public transport for a long time as follows:

*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 an outbreak.*

Another respondent from the passenger category, a 28-year-old female secretary commented as follows:

*Sometimes, people get to the station and they have to attend to natures call, but there is no water for them to wash their hands. Some people forget to look for water outside the washroom to wash their hands after visiting the toilet, and when they return to the waiting area or the vehicle and start touching surfaces like the seats, it is possible for them to leave some form of bacteria or germs on those surfaces. If another person should touch the seats unknowingly and uses that same hand to eat anything without washing, the person could be infected by the bacteria or germ which could result in sickness.*

The few (15%) who did not agree that communicable diseases could be spread on public road transport systems were of this view because they had had previous experiences of boarding commercial/public transport vehicles with persons suspected to be infected with communicable diseases, but did not contract the disease. These set of respondents likewise had no idea of what conditions could or could not contribute to the spread of communicable diseases on public road transport system.

On the other hand, passengers who believed that communicable diseases could be transmitted on public road transport systems felt that non-isolation of infected passengers, poor sanitation facilities, food being sold, bought and eaten at the various transport yards as well as overcrowding on vehicles were some conditions which could contribute to the spread of communicable diseases. They argued that, they would feel irritated and annoyed at those who argue that diseases cannot spread on the public road transport system. They were also of the view that hand washing, getting vaccinated as well as cleaning and disinfecting commonly used surfaces could prevent the spread of communicable diseases on public road transport systems. All respondents noted that the reason for their various reactions was because they would not want to get infected.

### **Risk assessment of operators and passengers**

From the perspective of the leadership, respondents from the Achimota bus Terminal, VIP and STC Yards believed that they were not at risk of contracting communicable diseases due to their very hygienic and neat/clean

compounds. This was vividly 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 concreted 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 are also sold under hygienic conditions and we have put in place adequate waste management facilities. I do not think it is risky working under such hygienic condition.*

Meanwhile, the other respondents from Kaneshie Market main lorry station, Kaneshie Metro Mass Transit (MMT) station, Circle Neoplan Station, Tudu Main Lorry Station and the Madina Main Lorry station believed that they were at a very high risk of contracting communicable diseases due to poor environmental conditions at their various stations. They cited poor sanitation, contaminated air, dusty environment, overcrowding leading to contact with infected persons as well as food and water contamination as factors which could put them and others at risk at these stations. The respondents stated that using public transport is risky because of how easy it is to contract a communicable disease during an outbreak.

Most of the driver respondents believed that they were at risk of contracting communicable diseases on the public transport system. However, they noted that very hygienic compounds with well-structured wash rooms, provision of waste bins, accessibility to water at washrooms, access to washrooms and toilet at the various transport terminals/stations could help reduce the risk of spread of communicable diseases. They cited contaminated air, dusty environment, contact

with infected persons as well as food and water contamination as some of the things which could put them and others at risk on public commercial vehicles. The respondents stated that using public transport was risky because of how easy it is to contract a communicable disease during an outbreak.

With the passenger respondents, most interviewees agreed that they considered themselves at risk any time they used public transport for their activities as a result of poor sanitation at these stations, improper disposal of waste as well as insect or animal bites capable of transmitting diseases. Again, they all agreed that the use of public transport was very risky because in case of any outbreak, one could easily contract it on public transport. 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 manner. 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 that time they do, it might be too late for prevention.*

However, they 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. Notwithstanding, the few who argued that communicable diseases could not spread on public vehicles indicated that it was not risky using public transport for their activities.

## **Perceptions and attitudes towards suspected infected persons on commercial vehicles**

All respondents believed they would somehow feel uncomfortable, but be calm and politely advise anyone who sat by them on public vehicles who started coughing and sneezing indiscriminately to cover his/her mouth with handkerchief to prevent others from getting infected. They were also of the view that sickness is inevitable hence we are all prone to falling ill at any given time or place thus their feeling of empathy towards such persons they encounter. They stated that they would then proceed to give health advice to such persons to always cover their mouths and noses when sneezing to avoid spreading the infection and then move away from them or avoid sitting close to them.

All the drivers, in responding to this question also believed they would be uncomfortable but calm and politely advise anyone who sits by them on public vehicles who start coughing and sneezing indiscriminately to cover his/her mouth with a handkerchief and open the windows to allow fresh air to diffuse the contaminated air. The reasons for their supposed reaction in such situations are primarily to at least prevent themselves and others from contracting any infection. Again, they were of the view that sickness was unavoidable hence we are all prone to falling ill at any given time or place thus their feeling of empathy towards such persons they encounter. A 32-year-old driver who has been driving commercial vehicles for about ten years had this to say:

*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, they go to 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 I know someone who is infected who sits by me, I will really feel uncomfortable with such a person.*

All respondents in the passenger category similarly were of the view that it was advisable to keep calm and advise an infected person who starts coughing and sneezing indiscriminately on a public vehicle to cover their mouths with handkerchief and also, to open all windows to allow fresh air to diffuse the contamination in order to stop its spread and prevent others from contracting it. However, they indicated that they would feel uncomfortable if they came into contact with such a person. These respondents believe that illness is something which is unavoidable and in one way or the other, we all are vulnerable and thus, are likely to fall ill at any time or place irrespective of who we are. They all also stated that the humane thing to do when confronted with such a situation is either to move away to a different seat or remain calm and give health advice on the need for the infected person to seek medical advice from health facilities and why it is important for such persons to cover their mouths and noses when sneezing or coughing to avoid spreading the disease to others. Some indicated that in extreme conditions, they would rather protect themselves if suspected infected persons did not heed to their advice. A 33year old lady expressed how she will feel as follows:

*To be honest with you, I will feel uncomfortable if a suspected or known infected person sat by me and starts 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 advise 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.*

### **Operators' and passengers' suggestions on possible preventive measures**

Whilst some (5 out of 8) respondents from the leadership stated that they had not put in place any measures to prevent the spread of communicable diseases at the station and on station vehicles, others stated that hand sanitizers, tissues and dustbins are placed at the station and on vehicles to enhance sanitation. A 25 years old male passenger observed thus:

*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 scorching 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 also 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.*

Again, whilst some (6 out of 8) respondents could not make any suggestion on the measures which should be put in place on public vehicles and at stations to prevent the spread of communicable diseases, a few (2 out of 8) of the respondents believed that the use of sanitizers during, before and after every journey and the provision of First Aid kits could help prevent the spread of communicable diseases on commercial vehicles at the stations. They also suggested that educating passengers on communicable diseases, possibly at every station and the provision of good washrooms with soap and water could help prevent the spread of communicable diseases.

Respondents mentioned that operators and drivers could contribute toward the prevention of spread of communicable diseases by providing an isolation seat or area within the station and on commercial vehicles to help reduce the spread of communicable diseases. Dustbins placed at vantage points, both at the station and on public vehicles, as well as the provision of hygienic washrooms with running water and soap at the various stations were mentioned, and improved sanitary

conditions at the station could help reduce the spread of infections. Respondents believed that passengers also have a responsibility of contributing to the prevention of the spread of communicable diseases on public vehicles and at stations by covering their mouths whenever they sneeze or cough.

Some of the stakeholders who should be involved in the prevention of the spread of communicable diseases on public road transport systems included Accra Metropolitan Assembly (AMA), Ghana Private Road Transport Union (GPRTU), National Road Safety Commission, Ghana Red Cross, the Driver and Vehicle Licensing Authority (DVLA) and bookmen. Respondents were of the view that these stakeholders had important roles to play in the fight against the spread and prevention of communicable diseases both on commercial vehicles and at the various transport terminals and also on our roads by providing public health education relating to disease prevention, ensuring that first-aid kits are placed at bus terminals and on commercial vehicles as well as making provision for regular health screening and checks for drivers and officials.

Just like the leaders, whereas some (75%) driver respondents stated that they had not put in place any measures to prevent the spread of communicable diseases on their vehicles, others (25%) were using health education in relation to disease prevention, good hand washing procedures as well as case isolation and effective treatment of diseases as preventive measures which they had personally put in place to prevent the spread of communicable diseases on their vehicles. Again, whilst some (71%) respondents could not make any suggestion on the appropriate measures which should be put in place on public vehicles and at

stations to prevent the spread of communicable diseases, quite a few (29%) of the respondents believed that the use of sanitizers during, before and after every journey and opening of windows in vehicles to allow fresh air to circulate instead of the use of air conditioners on vehicles could help prevent the spread of communicable diseases on commercial vehicles and also, at the stations. A 38-year-old driver at one of the stations asserted thus:

*Sometimes I have problem with the way we blacks 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.*

Interviewees mentioned that operators and drivers could contribute toward the prevention of the spread of communicable diseases by providing dustbins placed at vantage points, and hygienic washrooms with running water and soap at the various stations. They also made mention of the need for all vehicles to have first aid kits on them. Respondents believed that passengers also have a responsibility of contributing to the prevention of the spread of communicable diseases on public vehicles by using sanitizers before and after every journey and also, eating and drinking from hygienic environment. Others (17%) were also of the view that one should not travel on commercial vehicle when one is sick to avoid spreading the infection.

The Accra Metropolitan Assembly (AMA), Ghana Private Road Transport Union (GPRTU), National Road Safety Commission, Ghana Red Cross, the Driver and Vehicle Licensing Authority (DVLA) MMT Managers and board of directors, MTTD and bookmen were mentioned as some of the stake holders who should be involved in the prevention of the spread of communicable diseases on public road transport systems. Respondents (83%) from the driver category were of the view that these stakeholders had important roles to play in the fight against the spread of communicable diseases both on commercial vehicles and at the various transport terminals by providing public health education relating to disease prevention, implementing good hand washing procedures and ensuring good checks on first aid boxes and kits at various Bus Terminals. A respondent observed:

*It is true that the DVLA and Road Safety people 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 skill to do so. All these measures are geared towards preventing road crashes and its associated casualties and cost. However, 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 Road Safety Commission on the other hand could incorporate public education on this issue into their normal education on accident prevention.*

Some passengers (29 out of 48) from the various stations claimed that nothing had been done to educate them on measures that are presently in place to prevent the spread of communicable diseases on public commercial vehicles, others (19 out of 48) were also of the view that health education had been ongoing at the various stations and in the media by the government and other stakeholders. A 28-year-old male passenger and a business man who uses public transport at least three times every week could not hide his feelings when he observed thus:

*I think your coming here to interview me has triggered my awareness. Although I know some of these diseases can spread in public places such as the vehicle environment, I have never been conscious of this fact to make me take precautionary measures. I think such a research like you are doing is commendable and must be encouraged.*

A 19-year-old female passenger and a 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.*

Again, whilst some (21%) respondents from the passenger category had no suggestion on the preventive measures to be put in place on public vehicles and at stations, most (79%) respondents stated that persons with infections should either not be allowed on public transport, or an isolated seat or area be created within the station and on the vehicle to reduce the spread of communicable diseases. Respondents (over 90%) also advised that passengers could help prevent the spread of communicable diseases by not travelling on public transport when they fall ill and also eating and drinking from hygienic environment. Generally, respondents felt that improving the sanitation standard at the stations and on commercial/public vehicles could go a long way in helping to prevent the spread of communicable diseases.

### **Discussion of Results**

Travel times for journeys, length of time working in the transport sector, destinations of journeys and the frequency of use of public transport were some of the initial issues that data was collected on during the interview. These issues were raised because, literature has it that the longer or more frequent a person is exposed to communicable diseases, the higher the potential to increase one's susceptibility (WHO, 2006). It was realized that most (over 96%) operators (leadership and drivers) had been in the transport business for more than ten years. The data also indicated that passengers' frequency of use of public commercial vehicles ranged from daily through to four times a year. Journey

times also ranged from four hours to over twelve hours. This indicates that respondents are at risk of being infected should they be exposed to any condition that could spread communicable diseases. 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).

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 are. 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 are transmitted. This also shows that they have fair idea of communicable diseases, and according to the Health Communication Theory, this knowledge could trigger respondents desire to take preventive actions. However, some of the respondents could not remember the last time they heard of an outbreak of a communicable disease. This could mean that they do not actually track the outbreak of such diseases. A large proportion of respondents (70%) however indicated that they heard of the Ebola outbreak in 2014-2015 in some neighbouring African countries, and also cholera outbreak in Accra. This section of respondents could be said to be tracking the outbreak of communicable diseases both in and around Ghana.

Most (86%) of the respondents from all the categories indicated that it is possible for some communicable diseases to spread on the public road transport system. Some of the conditions that they cited to buttress their argument 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 is vended at the station. The conditions mentioned by respondents as possible ways of spreading diseases on the public road transport system were found to be consistent with what the literature has expounded, especially the conditions stated under the epidemiology triad (Fig. 2).

On the hand, the data also showed that some respondents did not believe communicable diseases could spread on the public road transport system. Indeed, a few (9%) responses, all 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. It could also be that those who made this assertion have strong immune system 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 (Centers for Disease Control and Prevention, 2006). These responses could also be linked to the Health Believe Model which stipulates that a person's health-related behaviour depends on the person's perception of four critical areas which are: the severity of potential illness; the person's susceptibility to that



illness; benefits of taking preventive action; and barriers to taking that action (Freimuth et al., 2000).

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 (76%) of the respondents from both the driver and passenger categories, and they explained that people from all walks of life use public transport and one may 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 when she did a study on migration and the spread of communicable diseases. She asserted that, communicable diseases could be spread on public vehicles themselves, due to the fact that people from different backgrounds congregate in an enclosed area such as public vehicles. The data also showed that although people perceive the use of public transport as risky, they turn to ignore this fact because they have no other alternative means of travelling. It was also realized from the data that, risk itself is a perception which is dependent on a person's orientation, past experiences and beliefs.

One of the findings suggested that respondents (all) 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. All said they will feel uncomfortable if they sat by a person who coughs or sneezes indiscriminately. The implication of the responses could be that, people must endeavour to adopt preventive measures like

cough etiquette on the public road transport system if they profess that they would feel uncomfortable with others who are suspected or known to be infected but who do not observe such preventive measures. Another observation that was made from the data 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 infected 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 studies have 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 (5 out of 8) of the stations to prevent the transmission of diseases. Rather, environmental conditions at these stations was a recipe for disaster. Personal responsibility, change of attitude and implementation of adequate measures by all stakeholders also emerged from the data. It was also realized that consistent public education is important in the effort to preventive the spread of some communicable diseases on the public road transport system.

Out of the stakeholders that were mentioned, those that were of most interest in the study were the role of the DVLA, the NRSC and the police. In trying to understand the role these three institutions play in reducing the spread of

diseases on the public road transport system, what emerged was that since the two institutions (DVLA and NRSC) are 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. With the role of the police, although no respondent was able to give a vivid explanation, it was assumed that, because the police is responsible for enforcement in the road transport sector they had a role to play. It was therefore not out of place for some respondents to have mentioned them as stakeholders.

An attempt was made to ascertain if the demographic characteristics (sex, age, occupation, education, marital status and religion) had influence on respondents' perceptions on the spread of communicable diseases on the public road transport system. This was done by comparing the responses to the issues from each respondent to the others, noting similarities as well as differences. It was realized that, the themes from the responses were similar for both the male and female respondents. The same was generally observed for all the age groups, type of occupation and all the other demographic characteristics of respondents. Responses to issues raised under almost all the various research questions were similar. The little difference that was detected was on the issue of peoples' attitude towards suspected infected people. The responses showed that the female respondents were more elaborate on how they would feel towards such persons than their male counterparts did. The responses further showed that the female respondents would be more protective of themselves than the male respondents if they came into contact with an infected person in the transport environment.

## Summary

This chapter looked at data analysis and interpretation. The data gathered for this study revealed that, respondents in the study have a fair idea of communicable diseases and how they are spread. Most of the respondents were of the view that communicable diseases could spread on the public road transport systems, and went ahead to identify the conditions that could aid spread of communicable diseases in the transport environment. They also suggested some stakeholders who they thought were relevant to the prevention of spread of communicable diseases, and things that could be put in place both at the stations and on vehicle to prevent spread of diseases. The demographic characteristics of respondents did not affect the responses that came out. This however does not mean that if a different set of respondents were sampled for the study, their demographic characteristics would not affect their responses.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Introduction

This final chapter summarises the entire study and draws conclusions based on the findings made. The chapter ends with recommendations on preventive measures that could be put in place in the road passenger transport sector to reduce the spread of communicable diseases.

#### Summary

The purpose of the study was to solicit the perspectives of road transport operators and passengers on the transmission of communicable diseases on the public road transport system in Accra, Ghana. The research questions that guided the study were:

1. What are the general views of transport operators especially drivers, and passengers on the spread of communicable diseases?
2. What is the level of awareness of transport operators and passengers on the spread of communicable diseases through the use of public vehicles?
3. How do drivers and passengers assess the risk of possible infections on public transport system?
4. What attitude do passengers put up towards suspected infected persons on public transport system?

5. What measures are in place or should be instituted to prevent the spread of communicable diseases on public road transport systems?

The Health Communication Theory was the conceptual framework on which the study was based, and the qualitative approach to data collection and analysis which is associated with the interpretivist research paradigm was adopted for the study. Accidental and purposive sampling were combined with the quota sampling method to select a total of 80 respondents from the leadership, driver and passenger categories, and in-depth interviews were conducted for all the respondents. The respondents from the various categories were drawn from eight lorry stations, mostly located in the Accra Metropolitan area, with one located in the La-Nkwantanan Madina Municipal Assembly. To compliment this method, observation was also carried out to ascertain the cleanliness of the station environment and the interior of the vehicles, as well as ventilation and the arrangements of the seats on the vehicles.

A summary of the results follows next.

- Data gathered indicated that journeys from the various stations visited in Accra to other destinations lasted between four and twelve hours. The destinations ranged from towns in Ghana to cities and towns in other neighbouring West African countries. This was done because literature suggests that the longer one is exposed to a bacteria or virus, the more the person is at risk of acquiring infections that bacteria or virus bring.

- The respondents showed that they had a fair idea of what communicable diseases are, and how they are transmitted. They were also able to give various examples of communicable diseases in general. On the question of the last time respondents heard about an outbreak of such communicable diseases as they had cited, a few (37%) of the respondents could not remember the last time they heard of an outbreak. On the other hand, most (63%) of the respondents said they had heard about cholera outbreak in Accra within the last one year and also the outbreak of the Ebola virus disease in some neighbouring West African countries.
- Most (86%) respondents agreed that it was possible for communicable diseases to spread in the station environment as well as on the vehicle, and went ahead to give reasons why they thought this was so, such as overcrowding at the station and on vehicles, unhygienic and dusty stations environment, food vending under unhygienic conditions, not to standard ventilation on some vehicles, arrangement of seats which calls for people to sit in close contact to each other, and peoples' attitude towards handling coughing and sneezing on vehicles and at the station.
- It also emerged that those who worked in well-structured stations with clean environment and proper facilities for sanitation did not think that they were exposed to the risk of contracting communicable diseases.
- Most (85%) respondents from both the driver and passenger categories however indicated that they were at risk when driving or using public vehicles. They indicated that, if one considers the ways in which these

diseases spread, then all who use public transport frequently are at risk of being infected should there be any outbreak. Even those who used air-conditioned vehicles (19%) indicated that it was risky if an infected person was on board such buses.

- All respondents indicated that they would feel very uncomfortable if they got into a situation where they sat close to one known to be infected with a communicable disease.
- On how to prevent infection, some respondents (about 20%) indicated that they had provided tissues, hand sanitizers and waste bins on their vehicles for passenger use. Others said they had first aid on their vehicles to cater for passengers should a situation arise. However, respondents from other stations that were not so well organized indicated that nothing was in place to prevent the spread of communicable diseases both at the station and on vehicles.
- The major stakeholders that would be relevant to the prevention of spread of communicable diseases on the public transport system include operators, passengers, city authorities, media, the police, DVLA, NRSC, Ghana Health Services and the Ministry of Transport.
- Whereas some of the stations were well organized with good facilities like waiting place for passengers and clean washroom with soap and running water for hand washing, others did not have such facilities. Out of the eight stations visited, only three had adequate facilities and clean environment.



## Conclusion

We can easily conclude that operators and passengers used for the study had a fair idea of what communicable diseases are in general and how they are transmitted. They were also aware of the environmental factors that could contribute or aid the outbreak and spread of communicable diseases.

On the issue of communicable diseases spreading on the public road transport systems, it was realized that most (86%) of the respondents were aware of some of the diseases that can spread in the station environment as well as on vehicles. Notwithstanding their knowledge of issues related to communicable diseases, it was realized that respondents did not make conscious effort to take precautionary measures to protect themselves and others when in the transport environment. This situation could put all users of public transport, including the operators themselves at risk especially in case of any outbreak. Also some environmental factors like dust, improper waste management and inadequate toilet facilities that were observed at most of the stations could aid the spread of communicable diseases.

Respondents will not feel comfortable with persons who are suspected or known to be infected with any communicable disease in the transport environment. However, their reaction would be to politely advise such persons to take preventive measures to reduce the chance of infecting others. Alternatively, respondents would take preventive measures themselves to avoid them being infected by other people.

Public awareness creation and education are the key to sensitizing the public to consciously behave in ways that will prevent them and others from being infected with any communicable diseases in case of any outbreak. Putting together a preparedness plan, as has been done in the air transport sector, and reviewing such plans periodically would also help in preventing diseases spreading on the public road transport system.

Respondents are aware of individuals and institutions who have a stake in ensuring that communicable diseases are not transmitted in the public road transport system. Respondents do not only know stakeholders but suggested the roles that the various stakeholders identified would play in the prevention of spread of diseases in the public transport sector. Prevention of spread of diseases is therefore the duty of all individuals and organisations who are interested in the operations and services of public road transport sector in the city of Accra in particular and Ghana in general.

### **Recommendations**

Based on the conclusion drawn from the study, the following recommendations are made to operators, passengers and all institutions mandated to contribute to the safety and well-being of the road passenger transport sector.

- The DVLA should ensure that vehicle conversion, which is common in Ghana is done according to international standards. Adequate windows which allow good ventilation should be prescribed and enforced during conversion. The situation where

five seats are put on a vehicle like the Mercedes Benz Sprinter buses which are commonly used for the carriage of passengers in Ghana should be reduced to four seats and three passengers on a row.

- Operators and vehicle owners must ensure that they adhere to specifications in a situation where there is the need to convert a vehicle from goods carriage to the carriage of passengers. They must also ensure that operations are done in more hygienic environment where passengers will have access to waiting places, waste bins and adequate washrooms with soap and running water for hand washing. They should also provide tissues and hand sanitizers at the station and on vehicles for passenger use. Operators must consider disinfecting the interior of their vehicles (especially the seats) possibly after every journey. They should incorporate passenger education in their daily activities to constantly sensitize passengers.
- Passengers are also advised to always ensure that they take personal steps to protect themselves and others from the risk of infection. They should ensure that they inculcate good hand washing into their daily activities and especially when they visit the toilet or urinal. This will prevent the possibility of eating with contaminated hands or contaminating things like seats on the transport system. They should adopt cough or sneeze etiquette

when on public vehicles. Passengers are also encouraged to carry tissues and hand sanitizers anytime they travel. They should also wear protective clothing when it becomes necessary during a journey.

- The Ministry of Transport should develop a policy document on how to prevent spreading communicable diseases on the public road transport system and ensure that operators adhere to the best practices in operations. The development of this document should be done in collaboration with the Ministry of Health (MoH) and the Ghana Health Services. The Ministry should also organize periodic training and sensitization for operators and passengers as well.
- The health authorities, especially those in public health should extend their education on spread of communicable diseases to the transport stations. This would keep operators and passengers constantly aware of the topic under discussion. The health authorities could also provide periodic medical screening at the various transport stations at no cost to operators and passengers. The health authorities could also assist the Ministry of Transport to develop a policy document on best practices in ensuring good health in the transport sector in Ghana.
- The police must ensure that vehicles that run passenger transport with seat arrangement contrary to what has been stipulated by the

DVLA are made to comply with acceptable standards, so as to prevent overcrowding on passenger vehicles and its associated consequences like spread of diseases.

- The spread of information is mostly championed by the media. To this end, the media in Ghana, both electronic and print should help in educating the public on spread of diseases in public places, especially on the public road transport system.
- Government should take up the building of good terminals in the cities especially with all the facilities that a terminal needs in order to qualify for that status. This will reduce the situation where individuals organize lorry stations that are not up to standard, which sometimes contribute to health effect on the public. Operators must be made to use such facilities at a fee payable on daily, weekly, monthly or annual basis, depending on the convenience of each operator.
- The city authorities must also ensure that regulations bordering on sanitations are strictly enforced at the various lorry stations, and where refuse collection for instance is under the jurisdiction of the Assembly, it must be ensured that it is done regularly according to the volume of waste that is generated at each station.

### **Avenues for future research**

Although the data collected from the field in this research points to the fact that it is possible for some communicable diseases to spread on the public

road transport system, there has not been any research where samples have been collected for laboratory test to empirically make this conclusion. It is therefore important that a study is done to actually ascertain the assertion made above. In respect of this, individual researchers as well as institutions, especially those concerned with public health issues should conduct a study where samples will be collected at the station and on vehicles for testing in the laboratory. The Noguchi Memorial Institute for Medical Research is one of the institutions that can take the research topic up and conduct a further study into it. The School of Allied Health Sciences, University of Cape Coast, could also undertake a research into the phenomenon. The outcome of such research can then confirm or reject the assertion that communicable diseases can spread on the public road transport system. A similar study was carried out in the air transport industry in 1998, and that led to the collaboration between IATA, ICAO and WHO to develop a policy document on prevention of spread of tuberculosis on aircrafts (WHO 1998, 2006, 2008).

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9-2

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## APPENDICES

### APPENDIX A

UNIVERSITY OF CAPE COAST  
COLLEGE OF HUMANITIES AND LEGAL STUDIES  
FACULTY OF SOCIAL SCIENCES  
DEPARTMENT OF GEOGRAPHY AND REGIONAL PLANNING

#### INTERVIEW GUIDE FOR MPhil THESIS-PASSENGERS

**Title: Perspectives of transport operators and passengers on the spread of communicable diseases on public road transport system in Accra.**

This interview guide is strictly for academic purpose. You are at liberty to decide which questions you will answer and which ones you will ignore. At any point in the interview process, if you wish to discontinue, you may freely say so. You are also assured that anything you say during the interview will be treated with confidentiality and anonymity. Please feel free to ask the interviewer any question that beats your mind.

#### **Caution to the interviewer**

Please note that respondents must willingly accept to be part of the interview. Should any respondent decide to discontinue with the interview at a point in time, he/she is at liberty to do so and must be allowed. Avoid questions that will embarrass or humiliate any respondent.

#### **SECTION A: DEMOGRAPHIC CHARACTERISTICS**

1. Sex      i). Male [ ]      ii). Female [ ]
2. Age:      i) 18-29 [ ]    ii) 30-39 [ ]    iii) 40- 49 [ ]    iv) 50- 59 [ ]    v) 60 + [ ]
3. Occupation: i). Student [ ]    ii) Civil/Public Servant [ ]    iii) Trader [ ]  
iv) Businessman [ ]    v) others, please specify.....
4. Educational background: i) None [ ]    ii) Primary [ ]    iii) Secondary [ ]  
iv) Vocational or technical[ ]    v)Tertiary[ ]    vi) Others (Please Specify).....
5. Marital status: i) Single [ ]    ii) Married [ ]    iii) Divorced [ ]    iv) Separated [ ]

v) Widow/ Widower [ ]

6. Religious affiliation: i) Christian[ ] ii) Muslim[ ] iii) Traditionalist[ ] iv)

Others (Please Specify).....

**SECTION B: General knowledge of communicable diseases.**

1. How often do you use public transport for your activities?
2. What normally is the purpose of your journeys?
3. On the average, how long do your journeys take in terms of time?
4. What do you know about communicable diseases?
5. Describe all the communicable diseases that you know about.
6. How do you think these communicable diseases are transmitted?
7. When was the last time you heard about an outbreak of any of these communicable diseases?

**SECTION C: Knowledge of the spread of communicable diseases on the public road transport system.**

8. Do you think communicable diseases could be transmitted on public road transport systems?
9. What is the reason for your answer?
10. What conditions do you think can/cannot contribute to the spread of communicable diseases on public road transport system?
11. If anybody argued that communicable diseases cannot be spread on public vehicles, what will be your reaction?
12. What is the reason for your possible reaction?

**SECTION D: Risk assessment of operators and passengers regarding possible infection of communicable diseases on public vehicles.**

13. Do you consider yourself at risk for using public transport for your activities?
14. What do you think of the station environment with respect to the spread of communicable diseases?
15. How risky do you think it is to use public transport?
16. What are some of the things that you think could put you at risk on public commercial vehicles?

**SECTION E: People's perspective and attitudes towards suspected infected persons on public commercial vehicles.**

17. Suppose someone sitting by you on a public vehicle starts coughing or sneezing indiscriminately, what would be your reaction towards that person?
18. What would be the reason for your possible reaction towards the suspected infected person?
19. Generally, what will be your reaction towards someone sitting by you whom you know to be infected with a communicable disease?

**SECTION F: Operators and passengers suggestions on possible preventive measures that could be adopted on public road transport system.**

20. Do you know of any preventive measures that are in place presently to prevent the spread of communicable diseases on public commercial vehicles?
21. What preventive measures do you suggest should be put in place on public vehicles and at stations to prevent the spread of communicable diseases?
22. What do you think should be the contribution of operators and drivers toward the prevention of spread of communicable diseases?
23. What should passengers also do to prevent the spread of communicable diseases on public vehicles?
24. What other stakeholders do you suggest should be involved in prevention of spread of communicable diseases on public road transport systems?
25. What do you think should be the role of these stakeholders in the prevention of the spread of communicable diseases on the public road transport systems?



## APPENDIX B

UNIVERSITY OF CAPE COAST  
COLLEGE OF HUMANITIES AND LEGAL STUDIES  
FACULTY OF SOCIAL SCIENCES  
DEPARTMENT OF GEOGRAPHY AND REGIONAL PLANNING

### INTERVIEW GUIDE FOR MPhil THESIS-DRIVERS

**Title: Perspectives of transport operators and passengers on the spread of communicable diseases on public road transport system in Accra.**

This interview guide is strictly for academic purpose. You are at liberty to decide which questions you will answer and which ones you will ignore. At any point in the interview process, if you wish to discontinue, you may freely say so. You are also assured that anything you say during the interview will be treated with confidentiality and anonymity. Please feel free to ask the interviewer any question that beats your mind.

#### Caution to the interviewer

Please note that respondents must willingly accept to be part of the interview. Should any respondent decide to discontinue with the interview at a point in time, he/she is at liberty to do so and must be allowed. Avoid questions that will embarrass or humiliate any respondent.

#### SECTION A: DEMOGRAPHIC CHARACTERISTICS

1. Sex      i). Male [ ]      ii). Female [ ]
2. Age:      i) 18-29 [ ]    ii) 30-39 [ ]    iii) 40- 49 [ ]    iv) 50- 59 [ ]    v) 60 + [ ]
3. Occupation: i). Student [ ]    ii) Civil/Public Servant [ ]    iii) Trader [ ]  
iv) Businessman [ ]    v) others, please specify.....
4. Educational background: i) None [ ]    ii) Primary [ ]    iii) Secondary [ ]  
iv) Vocational or technical[ ]    v)Tertiary[ ]    vi) Others (Please Specify).....
5. Marital status: i) Single [ ]    ii) Married [ ]    iii) Divorced [ ]    iv) Separated [ ]  
v) Widow/ Widower [ ]

6. Religious affiliation: i) Christian[ ] ii) Muslim[ ] iii) Traditionalist[ ] iv)  
Others (Please Specify).....

**SECTION B: General knowledge of communicable diseases.**

1. How long have you been driving a commercial passenger vehicle?
2. Which routes do you mostly ply?
3. On the average, how long do your journeys take in terms of time?
4. What do you know about communicable diseases?
5. Describe all the communicable diseases that you know about.
6. How do you think these communicable diseases are transmitted?
7. When was the last time you heard about an outbreak of any of these communicable diseases?

**SECTION C: Knowledge of the spread of communicable diseases on the public road transport system.**

8. Do you think communicable diseases could be transmitted on public road transport systems?
9. What is the reason for your answer?
10. What conditions do you think can/cannot contribute to the spread of communicable diseases on public road transport system?
11. If anybody argued that communicable diseases cannot be spread on public vehicles, what will be your reaction?
12. What is the reason for your possible reaction?

**SECTION D: Risk assessment of operators and passengers regarding possible infection of communicable diseases on public vehicles.**

13. Do you consider yourself at risk for driving a commercial passenger vehicle?
14. What do you think of the station environment with respect to the spread of communicable diseases?
15. How risky do you think it is to drive a passenger vehicle?
16. What are some of the things that you think could put you at risk on public commercial vehicles?

**SECTION E: People's perspective and attitudes towards suspected infected persons on public commercial vehicles.**

17. Suppose a passenger sitting close by you on your vehicle starts coughing or sneezing indiscriminately, what would be your reaction towards that person?
18. What would be the reason for your possible reaction towards the suspected infected person?
19. Generally, what will be your reaction towards someone sitting by you whom you know to be infected with a communicable disease?

**SECTION F: Operators and passengers suggestions on possible preventive measures that could be adopted on public road transport system.**

20. What preventive measures do you have in place presently to prevent the spread of communicable diseases on your vehicle?
21. What preventive measures do you suggest should be put in place on public vehicles and at stations to prevent spread of communicable diseases?
22. What do you think should be the contribution of operators and drivers toward the prevention of spread of communicable diseases?
23. What should passengers also do to prevent the spread of communicable diseases on public vehicles?
24. What other stakeholders do you suggest should be involved in prevention of spread of communicable diseases on public road transport systems?
25. What do you think should be the role of these stakeholders in the prevention of the spread of communicable diseases on the public road transport systems?

## APPENDIX C

UNIVERSITY OF CAPE COAST  
COLLEGE OF HUMANITIES AND LEGAL STUDIES  
FACULTY OF SOCIAL SCIENCES  
DEPARTMENT OF GEOGRAPHY AND REGIONAL PLANNING

### INTERVIEW GUIDE FOR MPhil THESIS-LEADERSHIP

**Title: Perspectives of transport operators and passengers on the spread of communicable diseases on public road transport system in Accra.**

This interview guide is strictly for academic purpose. You are at liberty to decide which questions you will answer and which ones you will ignore. At any point in the interview process, if you wish to discontinue, you may freely say so. You are also assured that anything you say during the interview will be treated with confidentiality and anonymity. Please feel free to ask the interviewer any question that beats your mind.

#### **Caution to the interviewer**

Please note that respondents must willingly accept to be part of the interview. Should any respondent decide to discontinue with the interview at a point in time, he/she is at liberty to do so and must be allowed. Avoid questions that will embarrass or humiliate any respondent.

#### **SECTION A: DEMOGRAPHIC CHARACTERISTICS**

1. Sex      i). Male [ ]      ii). Female [ ]
2. Age:      i) 18-29 [ ]    ii) 30-39 [ ]    iii) 40- 49 [ ]    iv) 50- 59 [ ]    v) 60 + [ ]
3. Occupation: i). Student [ ]    ii) Civil/Public Servant [ ]    iii) Trader [ ]  
iv) Businessman [ ]    v) others, please specify.....
4. Educational background: i) None [ ]    ii) Primary [ ]    iii) Secondary [ ]  
iv) Vocational or technical[ ]    v)Tertiary[ ]    vi) Others (Please Specify).....
5. Marital status: i) Single [ ]    ii) Married [ ]    iii) Divorced [ ]    iv) Separated [ ]  
v) Widow/ Widower [ ]

6. Religious affiliation: i) Christian[ ] ii) Muslim[ ] iii) Traditionalist[ ] iv) Others (Please Specify).....

**SECTION B: General knowledge of communicable diseases.**

1. How long have you been in the transport business?
2. Which routes do you mostly ply from this station?
3. What is the criteria for admitting drivers and vehicle into the station?
4. How many vehicles operate from this station on daily basis?
5. What do you know about communicable diseases?
6. Describe all the communicable diseases that you know about.
7. How do you think these communicable diseases are transmitted?
8. When was the last time you heard about an outbreak of any of these communicable diseases?

**SECTION C: Knowledge of the spread of communicable diseases on the public road transport system.**

9. Do you think communicable diseases could be transmitted on public road transport systems?
10. What is the reason for your answer?
11. What conditions do you think can/cannot contribute to the spread of communicable diseases on public road transport system?
12. If you found out that communicable diseases could be spread on public vehicles, what will be your reaction?
13. What is the reason for your possible reaction?

**SECTION D: Risk assessment of operators and passengers regarding possible infection of communicable diseases on public vehicles.**

14. Do you consider yourself at risk for working at this station?
15. What is sanitation like at this station and how do ensure continuous sanitation?
16. How risky do you think it is to use public transport?
17. What are some of the things that you think could put you at risk in this your work environment?

**SECTION E: People's perspective and attitudes towards suspected infected persons on public commercial vehicles.**

18. Suppose any of your divers or a passenger comes to sit by you and starts coughing or sneezing indiscriminately, what would be your reaction towards that person?
19. What would be the reason for your possible reaction towards the suspected infected person?
20. Generally, what will be your reaction towards someone sitting by you whom you know to be infected with a communicable disease?

**SECTION F: Operators and passengers suggestions on possible preventive measures that could be adopted on public road transport system.**

21. What preventive measures are in place presently to prevent the spread of communicable diseases at the station and on the vehicles that operate here?
22. What preventive measures do you suggest should be put in place on public vehicles and at stations?
23. What do you think should be your contribution as an operator and your drivers toward the prevention of spread of communicable diseases?
24. What should passengers also do to prevent the spread of communicable diseases on public vehicles and at the station?
25. What other stakeholders do you suggest should be involved in prevention of spread of communicable diseases on public road transport systems?
26. What do you think should be the role of these stakeholders in the prevention of the spread of communicable diseases on the public road transport systems?

## APPENDIX D

UNIVERSITY OF CAPE COAST, GHANA  
COLLEGE OF HUMANITIES AND LEGAL STUDIES  
FACULTY OF SOCIAL SCIENCES  
DEPARTMENT OF GEOGRAPHY AND REGIONAL PLANNING  
OBSERVATION CHECKLIST FOR MPhil THESIS DATA  
COLLECTION

### Station Environment

Availability of Waste bins for collection of refuse Available [ ] Not available [ ]

State of refuse collection at the station Daily [ ] Weekly [ ] Bi-weekly [ ]

Availability of Place of convenience (washrooms) Available [ ] Not available [ ]

Who owns and operates the washrooms? Operator [ ] Assembly [ ] Others [ ]

Do passengers use the washrooms for free or do they pay for it? Yes [ ] No [ ]

Cleanliness of the washrooms Very poor [ ] Poor [ ] Good [ ] Very good [ ]

Availability of soap and running water for hand washing at the washrooms

Available [ ] Not available

General cleanliness of the station Very poor [ ] Poor [ ] Good [ ] Very good [ ]

### On the Vehicle

Type of vehicles used for operations at the station

Capacity of vehicles

Interior cleanliness of vehicles

Arrangement of seats on vehicle

Ventilation on vehicles