KNOWLEDGE, PERCEPTION AND ATTITUDE TO CHOLERA OUTBREAK AMONG RESIDENTS IN IBADAN NORTH-WEST LOCAL GOVERNMENT AREA, NIGERIA

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DEDICATION

This project is dedicated to the Almighty God for His faithfulness, love, care and uncountable blessings.

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ABSTRACT

Cholera outbreaks have profound impacts on the health and well-being of communities. Rapid containment of outbreaks largely depend on people's knowledge, perceptions and attitude to the disease. Studies have shown an increase of outbreaks in developing countries. Ibadan Northwest (IBNW) Local Government Area (LGA) experienced recurrent cholera outbreaks between June and November 2011 in spite of cholera control programmes in Oyo state. Furthermore several studies have been done on perception of emerging disease outbreak but few on cholera outbreaks. Information on knowledge, perception, attitude to cholera outbreaks are important for planning preventive health educational programmes and this study was conducted to assess knowledge, perception and attitude to cholera outbreak among residents of IBNW LGA.

The cross-sectional design used a four-stage sampling technique to select 7 inner core, 4 transitory and 4 peripheral communities out of 28,15 and 17 communities respectively. Household from each community was selected based on sample size proportionate to size and 427 respondents from IBNW LGA. Respondents were interviewed using a semi-structured questionnaire which included questions on socio-demographic characteristics, knowledge, perceived vulnerability (likelihood of being infected by a disease), perceived severity and attitude to cholera outbreak. Knowledge was scored on a 19-point (score of ≤10 rated poor), perceived vulnerability on 15-point (scores of ≤7 rated low) while perceived severity was scored on 25-point (≤12 rated low) scales. A 24-point scale was used to score attitude to cholera outbreak (score of ≤ 12 rated negative). Data were analysed using descriptive statistics, Chi-square and logistic regression at p= 0.05.

Respondents' age was 35.0±11.4 years, 70.7% were females, 69.1% were married and 93.4% were Yoruba. Most (95.3%) of the respondents had good knowledge of cholera. About 71.4%

respondents knew the cause of cholera and most (97.2%) knew diarrhoea and (96.3%) vomiting as clinical symptoms of cholera. Many (69.8%) ate food prepared outside the house. The commonest source of information during an outbreak was the radio (38.6%). Majority respondents (62.3%) perceived their vulnerability to cholera to be low while 98.1% perceived severity of cholera to be high. Significantly, more respondents residing in the inner core communities perceived themselves vulnerable to cholera (OR=23.7: CI 9.64-58.31). Majority (71.2%) of the respondents had positive attitude in the mitigating efforts during a cholera outbreak. Respondents aged 18 to 30 years were more likely to have positive attitude in the mitigating efforts during a cholera outbreak (OR=3.24: CI 1.30-8.09). Many (82.4%) had never reported cases while 69.3% were willing to report cases .About 70.0% reported they would submit to being investigated during an outbreak.

Respondents' good knowledge of cholera, high perception of its severity and positive attitude in the mitigating efforts during an outbreak offered windows of opportunity in the control of cholera outbreak. However specific risks communication should be aimed at improving hygiene practices and focus on perceived vulnerability.

Keywords: Cholera outbreak, Cholera knowledge, Respondent attitude, Cholera severity, Cholera vulnerability

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ABBREVIATIONS

CDC	Centres For Disease Control and Prevention
CFR	Case Fatality Rate
CI	Confidence Interval
DSNO	Disease Surveliance and Notification Officer
FMOH	Federal Ministry of Health
IBNWLGA	Ibadan Northwest Local Government Area
IEC	Information, Education and Communication
LGA	Local Government Area
MOH	Ministry of Health
NDHS	National Demographic Health Survey
OR	Odds Ratio
UNICEF	United Nation Children's Funds
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

1.0 BACKGROUND

In developing countries, cholera often occurs as rapidly progressive, large-scale outbreaks (Swerdlow, *e tal*., 1997). These large-scale outbreaks cause a high burden of disease and rapidly overwhelm curative health care services, particularly during complex humanitarian emergencies or in settings where public health systems have broken down (Swerdlow & Isaacson, 1994). It is endemic in Africa, parts of Asia, the Middle East, and South and Central America. In endemic areas, outbreaks usually occur when war or civil unrest disrupts public sanitation services. Natural disasters like earthquake, tsunami, volcanic eruptions, landslides and floods also contribute to outbreak by disrupting the normal balance of nature (Quadri, 2005). These create many health problems; food and water supplies can become contaminated by parasites and bacteria when essential systems like those for water and sewage disposal are destroyed. Developing countries are disproportionately affected because of their lack of resources, infrastructure and disaster preparedness systems (Sur, 2000). In newly affected areas, outbreaks may occur during any season and affect all ages equally.

Cholera is a diarrhoea disease caused by infection of the intestine with the bacterium *vibrio cholera*, either type 01 or 0139. The bacteria is a short, curved rod shaped germ which produces a powerful endotoxin. Infection is mainly through ingestion of contaminated food or water (Kelly, 2001).The organism normally lives in aquatic

environments. People acquire its infection by consuming contaminated water, seafood, or other foods. Once infected, they excrete the bacteria in stool. Thus, the infection can spread rapidly, particularly in areas where human waste is untreated. According to Anderson (1975), cholera is a very serious infection involving the lower part of the small bowel. Approximately 10^2 – 10^3 cells are required to cause severe diarrhea and dehydration (Sack *et al*., 1998). Both children and adults can be infected. Cholera is usually transmitted through faecally contaminated water and food and remains ever-present risk in many countries. The disease no longer poses a threat to countries with minimum standards of hygiene, but it remains a challenge to countries where access to safe drinking water and adequate sanitation cannot be guaranteed. Typical settings for cholera are peri-urban slums where basic urban infrastructure is lacking.

A disease outbreak happens when a disease occurs in greater numbers than expected in a community or region, or during a season. According to CDC, an "outbreak" is the occurrence of more cases of disease than normally expected within a specific place or group of people over a period of time. An outbreak may occur in one community or even extend to several communities. African countries have continued to experience outbreaks of disease such as cholera, dysentery, measles, meningitis, plague, viral hemorrhagic fever and yellow fever; these continue to pose serious public health threats in Member states of the WHO African region. A disease outbreak causes severe threats to population health and causes large economic losses (WHO, 2000).

When cholera occurs in unprepared community the case fatality rates may be as high as 50% usually because of lack of facilities to treat those affected. Without treatment the

duration of non-fatal cholera is 3-5 days (Vlok, 1998). In its extreme manifestation, cholera is one of the most rapidly fatal infectious illnesses known. Within 3–4 hours of onset of symptoms, a previously healthy person may become severely dehydrated and if not treated may die within 24 hours (WHO, 2010). The disease is one of the most researched in the world today; nevertheless, it is still an important public health problem despite more than a century of study, especially in developing tropical countries. Cholera is currently listed as one of three internationally quarantinable diseases by the WHO, along with plague and yellow fever (WHO 2000).

1.1 PROBLEM STATEMENT

Acute diarrhoal disease in the form of cholera constitutes one of the greatest social evils and not only does it kill women, men and children in the developing countries but also retards the progress of education and can cost governments billions of naira to eradicate. Absenteeism by the workforce caused by cholera adversely affects industrial output. Cholera outbreaks can adversely affect tourism and affect tax revenues (productivity losses for business and individual due to the illness decrease tax revenues).Cholera outbreaks may lead to loss of trade.

Africa is particularly at risk of cholera outbreak as it continues to be important cause of morbidity and mortality. For example, between 2003 and 2007, 96% of all cases of cholera reported to WHO were reported from African countries (730 361 cases and 16 742 deaths).A total of 236 896 cases were notified from 52 countries, including 6311 deaths, an overall increase of 79% in 2007 compared with the number of cases reported

in 2005. This increased number of cases is the result of several major outbreaks that occurred in countries where cases have not been reported for several years (WHO, 2007). In some African countries, 10% or more of the reported cholera cases resulted in death, indicating problems with provision of timely and appropriate case management. The threat posed by cholera outbreak continues to increase with global ecological and environmental changes, as does the risk of amplification of communicable diseases among populations (WH0,2000).

In Nigeria, 44, 667 cases of cholera were reported from 2004 to 2006 with 817 deaths (CFR: 1.8) (FMOH, 2011). Cholera outbreaks were reported in Benue, Sokoto and Zamfara States between 2010 and 2011 with a total of 11,621 cholera cases with 293 deaths.The most recent cholera outbreak in Nigeria as at the time of this study was reported on the 12th August 2011, with a total of 13,364 cases with 342 deaths (CFR 2.56%) in 126 local Government areas of 23 states including Oyo State (FMOH, 2011). In Oyo state, Local Government areas affected were Ibadan North West, Ido, and Ibadan North. According to a National Newspaper in Nigeria, Daily Times Nigeria in August 22, 2011, "4 people were reported dead while 16 others were critically ill as a result of cholera outbreak in some parts of Ibadan North West Local Government Area of Oyo State".

Community perception about cholera outbreak is poorly understood and sufficient literature on this is lacking. However studies of how people responded to the outbreak of severe acute respiratory syndrome in 2002 suggest that perceptions or beliefs about an outbreak may be important in determining compliance with official advice. In particular

the literature on severe acute respiratory syndrome suggests that people may be more likely to comply with health related recommendations if they believe that the recommended behaviors are effective, they perceive a high likelihood that they may be affected by the outbreak, they perceived that the illness has severe consequences and they believe that the illness is difficult to treat (Rubin, *e tal*.,2009).

1.1 JUSTIFICATION

Almost every developing country is facing either cholera outbreak or the threat of an epidemic. However, with added burden of water shortages, there is growing concern that cholera could become more difficult to control. Furthermore with increase urbanization, cholera will be an increasing problem in future where sanitation and water safety are not adequate. Information on knowledge, attitude and practice to cholera outbreaks are important for planning preventive health education programmes.

A deeper understanding of community perception to disease outbreak would allow us to better anticipate and control potentially inappropriate and unexpected behaviors in the event of an outbreak. This behavior spring from the combination of factors such as personal values, social and cultural background, gender and education (Chang, *e tal.*, 2004). The dynamic nature of infectious disease transmission means that behavior by a number of individuals in a community can have a significant impact on the spread of an outbreak (Halloran, *e tal.*, 2008). Understanding the perception of the public to infectious disease outbreak would assist public health agencies to pinpoint knowledge gaps which may be utilized in developing educational programs to increase the awareness of the public. Learning more about knowledge, attitudes and behaviors of the public during an

infectious outbreak can be crucial to improve communication efforts by public health officials and clinicians.

Cholera control is far cheaper compared to curative approach. If suitable health care policies, plan and programs are to be utilized, greater formative information is needed. Ibadan Northwest Local Government Area (IBNW LGA) experienced recurrent outbreaks of cholera in recent past prior to year 2011 when the study was carried out, inspite of cholera control programme in Oyo State, Nigeria. This study was conducted to assess knowledge of cholera and its control practices, perceived vulnerability and severity to cholera and attitude to reporting and investigation among residents of IBNW LGA, Nigeria.

1.2 BROAD OBJECTIVE

To determine knowledge of cholera and its control practices, perceived vulnerability, perceived severity to cholera and attitude to reporting and investigation

SPECIFIC OBJECTIVE

1. To assess the knowledge of cholera and determine the main source of information during an episode of cholera outbreak among respondents.
2. To determine cholera control practices in the community.
3. To determine the community perceived risk to cholera outbreak.
4. To determine the community attitude to reporting and investigation of outbreak.

CHAPTER TWO

LITERATURE REVIEW

2.1 Global distribution of Cholera

The Ganges Delta region (India) is believed to be the traditional home of cholera from the time of recorded history (Harmer, 1999). From this region, cholera has spread throughout the world, causing six major pandemics between 1817 and 1961 (Faruque *et al*.,1998). It is believed that the European invasions of India and India's fostering of trade with the Dutch Indies spread the disease to other parts of the world. The seventh pandemic, which began in 1961 in Sulawesi, Indonesia, has now involved almost the whole world and is still continuing. The pandemic (i.e. the seventh) reached India in 1964, Africa in 1970 (Glass *et al*., 1991), southern Europe in 1970 and South America in 1991 (Swerdlow *et al*., 1992). The seventh pandemic was confined in Asia for nearly 10 years which later reached the west coast of Africa, the south coast of Europe, and the western Pacific islands in 1970. The seventh pandemic reached the Americas in 1991, starting from the Peruvian coast (Blake, 1993). The fifth and the sixth pandemics epidemiologically incriminated the classical biotype as the causative agent. The earlier pandemics are also believed to have been caused by the classical biotype as well, although there is no hard evidence. The seventh pandemic this time caused by the El Tor biotype has subsequently spread worldwide and largely replaced the classical biotype.

The burden of cholera is characterized by both endemicity and epidemics. Globally, cholera cases and deaths have increased steadily since the beginning of the 21st century. From 2004 to 2008, a total of 838,315 cases were notified to WHO, compared with

676,651 cases between 2000 and 2004, representing a 24% increase in the number of cases (WHO, 2009). The burden of the disease is currently enormous on developing countries and catastrophically on the African continent. The seventh pandemic is the first to have established persistent residence on the African continent. Africa alone has recorded over 2.4 million cases and 120,000 deaths from 1970 to 2005. This accounts for over 90% of both worldwide cases and deaths (WHO 2005, 2006).

2.2 The burden of Cholera

Cholera has been a substantial burden in the developing World for decades and it is endemic in Africa, Asia, South and Central America. Severe outbreaks usually occur in under-developing areas with inadequate sanitation, poor hygiene and limited access to safe water supplies, while in some countries a seasonal relation for cholera epidemics has been observed. Several decisions which concern cholera prevention and control are based on surveillance reports. However, due to the limitations in existing surveillance systems, differences in reporting procedures and failure to report cholera cases to W.H.O., official figures are likely to greatly underestimate the true prevalence of the disease, resulting to uncertainty in the exact scale of the problem. These hinder the provision of adequate intervention in at-risk populations as health-care professionals and policy makers might underestimate the true risk and burden of cholera, (Zuckerman, *e tal*., 2007).

2.2.1 Cholera in Africa

Since the early 1970s, cholera has been endemic in the African region and the threat of cholera is ever present especially during the rainy season. Towards the end of 2003, it

was estimated that half a million people were at risk as cholera had broken out in southern Mali. A similar situation prevailed in Benin Republic where a continuous cholera outbreak of eleven months had claimed lives and affected the whole communities In January 2004, the WHO reported that the cholera outbreak in Mozambique and Zambia had registered a total of 5,500 confirmed cases (Cheryl, S. 2004). From January to December 2010, cholera outbreaks were reported in neighboring countries to "Lake Basin" area: Niger, Chad and Cameroon (WHO, 2012).

2.2.2 Cholera in Nigeria

The cholera pandemic started in 1961, reaching West Africa and Nigeria late 1970. The first recorded cases of cholera in Nigeria occurred in a village near Lagos, on 26 December 1970 leading to an important epidemic of 22 931 cases and 2945 deaths (CFR 12.8%) during 1971. Between 1972 and 1990, Nigeria reported only very few cases. By 1991, 59'478 cases and 7'654 deaths have been reported with CFR of 12.9% which remains the highest rate reported by the country to date. Cases started to be recorded in January 1991 and among the first affected States were Kano, Akwa Ibom, Bauchi, Niger and Oyo. By September, the disease had spread to 19 of the 21 States including the Federal Capital. In March 1999, an outbreak of cholera was reported in Kano Municipal Local Government Area (LGA), Kano State. The outbreak was traced to the interruption of the domestic water supply for some days which forced people to use any water available. The outbreak also spread to Tofa LGA where 182 cases with 19 deaths were recorded over two weeks beginning in late April and further to Adamawa State (76 cases, 18 deaths) and Edo State (49 cases 24 deaths). Kano State seems to be particularly

affected by cholera outbreaks in November 2001, 2050 cases including 80 deaths were reported by 18 LGAs. During the first week of January 2007, suspected cholera cases were reported in Delta State affecting the following Local Government Areas (LGAs): Ughelli South, Bomadi, Oshimili South and Burutu. In October 2007, the Obi LGA in Benue State reported 60 cases of gastroenteritis including one death. In December 2007, Gbajimba, in Guma LGA (Benue State) reported 36 cases including 9 deaths of "suspected" cholera cases. In 2008, Nigeria reported 5,140 cases including 247 deaths and in 2009, Nigeria reported 13,691 cases including 431 deaths affecting mostly the eastern states of the country (WHO, 2012). In the last quarter of 2009, it was speculated that more than 260 people died of cholera in four Northern states with over 96 people in Maiduguri, Biu, Gwoza, Dikwa and Jere council areas of Borno state (Igomu, 2011). Most of the Northern states of Nigeria rely on hand dug wells and contaminated ponds as source of drinking water.

The 2010 outbreak of cholera and gastroenteritis and the attendant deaths in some regions in Nigeria brought to the forefront the vulnerability of poor communities and most especially children to the infection. The outbreak was attributed to rain which washed sewage into open wells and ponds, where people obtain water for drinking and household needs. From January to December 2010, Nigeria reported 41,787 cases including 1,716 deaths (CFR 4.1%) from 222 LGAs in 18 States of the country. The regions ravaged by the scourge included Jigawa, Bauchi, Gombe, Yobe, Borno, Adamawa, Taraba, FCT, Cross River, Kaduna, Osun and Rivers. Even though the epidemic was recorded in these areas, epidemiological evidence indicated that the entire

country was at risk, with the postulation that the outbreak was due to hyper-virulent strains of the organism, (Gyoh, 2011).

The most recent cholera in Nigeria was reported in 126 local Government areas of 23 states including Oyo State (FMOH, 2011). In 2011, the number of cholera cases started to increase during week 8 to reach a peak of 1200 weekly cases at the beginning of April. As of 23 October, 22,454 cases including 715 deaths (CFR 3.2%) were reported in 25 states (195 LGAs) (WHO, 2012).

2.3 Mode of Infection and Transmission

Cholera is a disease caused by the bacterium *Vibrio cholera* and infection is acquired by ingestion of water or food contaminated with faeces. The organisms do not spread beyond the gastrointestinal tract, where they multiply to very high concentrations in the small and large intestines. Unlike Shigellas, they do not penetrate the epithelial layer but remain adhered to the intestinal mucosa and produces diarrhoea as aresult of the secretion of an enterotoxin, called choleragen, (Volk *et al*., 1991). This leads to increased production of intercellular cyclic adenosine mono-phosphate, which causes the mucosal cells to pump out large amounts of water and electrolytes, (Zuckerman *et al*., 2007).

Cholera is most commonly transmitted through the fecal-oral route via contaminated water or food. In developing nations, this occurs most often through consumption of contaminated water. Because *Vibrio cholerae* has adapted to long-term survival in surface waters, often in association with zooplankton, plants, and crustaceans, eradication is not considered a realistic goal. However, the application of well established public health principles, ensuring universal access to potable water and the separation of human

faecal wastes from food and water sources are sufficient to prevent widespread cholera transmission. Through these measures, epidemic cholera was eliminated from Europe and the United States over a century ago. Although isolated cases and small, self-contained outbreaks of cholera still occur in developed nations, sustained cholera transmission, even under extraordinary conditions, generally does not occur.

Cholera transmission has been linked to contaminated drinking water drawn from shallow un-protected wells, rivers or streams, and even to bottled water and ice. Seafood has frequently been the source of cholera particularly raw or undercooked shellfish. Also, the consumption of high-risk food, impure water and poor sanitation associated with low socio-economic status and poverty to promote cholera transmission. Thus, socioeconomic status of an area plays an important role in cholera transmission. *V. cholera* spreads rapidly where living conditions are crowded, water sources unprotected and where there is no hygienic disposal of faeces, such as refugee camps and countries that are environmentally underdeveloped, (Steffen *et al*., 2003). The magnitude of bacterial inoculums required to give rise to severe infection with cholera is dependent on the health status of the individual. Although a high infectious dose of 105-108 bacteria is necessary to produce disease in healthy individuals, a much smaller inoculum can result in disease in certain populations, such as those with low levels of gastric acid. Low gastric acid levels and low socio-economic status have been linked to cholera. Gastric acidity is a major determinant of the size of inoculum required to generate disease, because gastric acid acts as a natural barrier to *v .cholerae*. Individuals with gastric hypochlorhydria or achlorhydria have been found to be at greater risk of developing cholera after infection

with a low inoculum. Furthermore, an association between *Helicobacter pylori*, linked to a reduction in gastric acid, and *v. cholerae* infection has also been observed, (Zuckerman *et al*., 2007). Common denominators in developing countries where cholera is an endemic disease include insufficiency of drinking water and sanitation, underemployment, reduced education and poor schooling, (Kumate *et al*., 1998).

For a cholera outbreak to occur, two conditions have to be met: there must be significant breaches in the water, sanitation, and hygiene infrastructure used by groups of people, permitting large-scale exposure to food or water contaminated with Vibrio cholera organisms; and cholera must be present in the population. In Nigeria, the 1996 cholera outbreak in Ibadan (Southwest) was attributed to contaminated potable water sources (Lawoyin, *e tal*. 1999). Street vended water and not washing hands with soap before eating food are possible reasons for the 1995-1996 cholera outbreaks in Kano state (Lipp, *e tal*., 2002). Drinking water sold by water vendors was also connected with increased risk of contracting the disease. In Katsina, the outbreak of the disease was linked to faecal contamination of well water by sellers (Umoh, *e tal*., 1983). The 2010 outbreak of cholera was speculated to be directly related to sanitation and water supply. The hand dug wells and contaminated ponds being relied on by most of the Northern states dwellers as source of drinking water was a major transmission route during the outbreak. Perhaps, these wells were shallow; uncovered and diarrhoea discharge from cholera patients could easily contaminate the water from the wells supplies (Igomu, 2011).

Another factor that may greatly contribute to risk of cholera transmission is population movement which enhances the spread of the infectious agent to others and to different

sites. For instance, all the surviving residents that fled a two month outbreak in Kebbi state (North-north) became indices for subsequent infection in the north and southern part of a neighbouring state (Okeke, *e tal*., 2001). In addition, overcrowding increases risk of contact with vomitus, excreta and contaminated water or food. Since early detection and containment of cases (isolation facilities) are paramount in reducing transmission, poor access to health services and poor diagnosis may become major barrier to controlling the infection. Lack of safe water and poor sanitation are important risk factors. All these features have contributed greatly to cholera infections in Nigeria.

2.4 Infection Pattern and Seasonality

In 1982, Katsina, Nigeria, was affected by an outbreak of gastroenteritis associated with Vibrio cholera serotype ´Ogawa´ (Umoh, *e tal*., 1983). The overall case fatality rate was 7.7%. During the Calabar, south southern part of Nigeria outbreak, adults and those in the 11-20 and 21-30year age groups accounted for most of the cases regardless of sex (Ndon, *e tal*., 1992). The report from Jos (North-central) indicated that age group 20-29 years had the highest isolation rate (Opajobi. *e tal*., 2004). The 1996 outbreak reported in Kano, Northern Nigeria affected 1,384 individuals with a fatality rate of 5.3% (Hutin, *e tal*., 2003). In Abeokuta, South-western Nigeria, between November 2005 and January 2006, 11 deaths from 115 cases with case fatality rate of 9.6% were reported from a cholera outbreak (Shittu, *e tal*., 2010). The 2010 outbreak was projected as the worst in Nigeria since 1991 with the highest case-fatality rates (Unicef, 2010). The Nigerian states with high CFR in the 2010 outbreak included Plateau, Kaduna and Katsina states at 23.0%, 9.0% and 7.6% respectively. Women and children accounted for 80% of reported cases

(Unicef. 2010). Cholera exists as a seasonal disease, occurring mostly during onset of rainy seasons. Pascual and colleagues highlighted the importance of rainfall as a driver of the seasonal cycle of cholera through its waterborne transmission (Pascual. *e tal*., 2002). Higher number of cases reported in Kano, Nigeria occurred during the rainy season (Umoh. *e tal.* 1983). In Calabar, South-southern part of the country, the incidence of cholera mostly occurred during the dry season followed by subsiding at the onset of rainy season (Ndon, 1992). Seasonality of infection is not a critical issue in Nigeria as infections have been reported in both rainy and dry seasons.

Socioeconomic and demographic factors have been reported to significantly enhance the vulnerability of a population to infection and contribute to epidemic spread (Borroto and Martinez, 2000). Such factors also inform the extent to which the disease will reach epidemic proportions (Emch. *et al*., 2008) and also modulate the size of the epidemic (Koelle and Pascual, 2004; Hartley *et al*., 2005). In epidemic prone regions like Africa, cholera outbreaks have been linked to multiple environmental and socio-economic sources (Acosta *et al*., 2001).

2.5 Clinical features of cholera

Cholera is an acute diarrheal illness caused by infection of the intestine with toxigenic bacterium vibrio cholera serogroup 01 and 0139. Infection can be asymptomatic, mild or severe. Approximately 1 in 20 infected persons have severe disease characterized by watery diarrhea, vomiting and leg cramps. In these persons, rapid loss of body fluids leads to dehydration, electrolyte disturbances and hypovolemic shock. Without treatment

death can occur within hours (Gaffga, *e tal*. 2007). WHO suggests that around 90% of episodes of cholera are of mild to moderate severity and are difficult to distinguish clinically from other causes of acute diarrhoea. Cholera begins with the sudden onset of massive diarrhoea and the patient may lose gallons of protein-free fluid and associated electrolytes, bicarbonates and ions within a day or two. This results from the activity of the cholera enterotoxin, which activates the adenylate cyclase enzyme in the intestinal cells, and converts them into pumps which extract water and electrolytes from blood and tissues. The water extract and electrolytes are then pumped into the lumen of the intestine. Severe cases are characterized by profuse watery diarrhoea, often accompanied by vomiting and acidosis. Up to 1 litre of stools may be produced per hour, becoming colourless, odourless and flecked with mucous. These are often described as 'rice water stools', (Steffen *et al*., 2003). The most striking feature of severe cholera is the voluminous watery stool output, and the dehydration it causes, leading rapidly to hypotension, tachycardia and vascular collapse. The patient becomes lethargic, with sunken eyes, cheeks and dry mucous membranes. Decreased skin turgor (skin-pinch sign) is found in all such cases. Urine flow is decreased or absent and serum specific gravity is consistently raised, (Sánchez and Taylor, 1997). Sixty percent of untreated patients die as a result of severe dehydration and loss of electrolytes, (Volk *et al*., 1991).

2.5.1 Treatment of Cholera

Deaths from cholera can be prevented through simple oral rehydration, and severe cases through intravenous rehydration, (Gaffga *et al*., 2007). The mortality rate of cholera can be reduced to less than 1% by the adequate replacement of fluids and electrolytes. The

inclusion of glucose in the salt solution which allows oral replacement of electrolytes has made treatment of the disease (particular in rural areas) much more effective. The use of any metabolizable carbohydrate together with NaCl also appears to be effective for electrolyte replacement. Thus, a well-cooked and salted rice soup is recommended for diarrhoeal patients who are unable to obtain a glucose-salt solution. Antibiotics, particularly tetracyclines, can reduce the number of intestinal vibrios and should be used along with fluid replacement, (Volk *et al*. 1991).

2.5.2 Control of Cholera

Control of cholera requires proper sewage disposal and adequate water sanitation, as well as the detection and treatment of carriers or reservoirs. Owing to this, hygienic water supplies are considered crucial for the control of cholera transmission. The transmission of cholera and other diarrhoeal diseases can be controlled by providing safe drinking water, ensuring adequate disposal of excreta and hygienic practices of the population at risk. The implementation of these measures requires political commitments and heavy investment of significant financial resources, (Steffen *et al*., 2003). The spread of cholera can also be controlled through the use of vaccines and mass chemoprophylaxis with antimicrobials, (Seas and Gotuzzo, 1996). In South Africa, treatment of water with chlorine or by boiling protected against illness from cholera (Sinclair *e tal*. 1982). Studies have indicated that the use of soap for hand washing can achieve a 26 to 62% decrease in the incidence of diarrhea in developing countries (Pinfold and Horan, 1996). In a large cholera outbreak in Kano City Nigeria, the study conducted suggested that the use of soap to wash hands before eating can prevent cholera infection (Hutin *et al*., 2003).

2.6 Community Perception of Risk

The behavior of the general population or specific risk groups can play an important role in both the spread and control of infectious disease. In case of an infectious disease epidemic, public health authorities will be dependent on the willingness and the ability of the general public to adhere to recommendations regarding personal hygiene, vaccination and/or prophylaxis, quarantine, travel restrictions, or closing down of public buildings such as schools during epidemics. One of the factors that may influence willingness and motivation to adopt precautionary behavior is risk perceptions (Brewer, *e tal*. 2007; Sjoberg, 2000) meaning the perceived personal vulnerability or likelihood of a disease or health threat. Perceived vulnerability combined with perceived severity, can be regarded as perceived threat (Onno, *e tal*. 2009). People are expected to have the highest perceived threat of cholera if they think that an infection with cholera is likely and will have serious health consequences. However, risk perception is certainly not the only determinant of protective behavior. Protection Motivation Theory suggests that response efficacy (the extent to which people believe that available protective actions against cholera are effective) and self-efficacy (the extent to which people believe they have the ability to engage in such protective actions) are two other key predictors of protection motivation, (Rogers, 1983).

The community knowledge about the disease plays a role in response to an epidemic crisis and could impact on collective attitudes (Blendon *e tal*. 2004; Hong and Collins, 2006). The trajectory of an infectious disease outbreak is affected by the behavior of individuals and is often related to individual's perception. The dynamic nature of

infectious disease transmission is such that behavior by a number of individuals in a community can have a significant impact on the spread of an outbreak (Halloran *e tal*. 2008). Understanding individual's behavior and its relation to their perceived risk is therefore important in terms of effective control of an infectious disease outbreak (Leung *e tal*. 2003). Public Health interventions have planned to control disease outbreak, but these national measures were proposed by health professionals who had no knowledge about the community perceived threat to disease outbreak. Some knowledge on community perception, sources of information during an episode and the attitude of community members in the mitigating efforts during a cholera outbreak at the grass root level could facilitate the adoption of preventive measures. It is against this background, that this study was designed.

CHAPTER THREE

METHODOLOGY

3.1 Study area: This study was conducted in Ibadan North West (IBNW) Local Government Area (LGA) of Oyo state. Ibadan Northwest Local Government Area is one of the six local governments located in Ibadan metropolis. It has a population of 180,644 people and a population density of 4,677persons per km^2. The inhabitants of the LGA are mostly Yoruba while the main occupation of the people are trading and working in the public service. The LGA is bounded on the north by Ido LGA, on the south by Ibadan Southeast LGA, on the west by Ibadan Southwest LGA, and on the east by Ibadan Northeast LGA (Ibadan North West Profile, 1998). The local government has eleven political wards and twelve public health facilities comprising of one secondary and eleven primary health care facilities. The secondary health care facility is headed by a medical Doctor while the primary health care facility is headed by the most senior health officer which can either be the Chief Nursing Officer (CNO) or the Chief Community Health Officer (CCHO). During a disease outbreak in the community, the health facility responds to outbreak through the DSNO. The DSNO at the health facility notifies the DSNO at the LGA level. The DSNO at the LGA goes into the affected area for disease survellaince and notifies the State DSNO. The State DSNO notifies the State Ministry of Health.

Ibadan city host the first television station in Africa NTA (Nigerian Television Authority), and the oldest surviving Newspaper the Tribune. The first private Television station Galaxy television in Nigeria started in the city. As at 2014 the city is home to

several media outlets including NTA Ibadan Network Centre, BCOS (Broadcasting Corporation of Oyo State) and the Africa Independent Television (AIT). The programmes of the media houses includes health educational programmes and jingles to sensitized the public.

The National Demographic and Health Survey (NDHS) 2013 data showed that the percentage of household with improved source of drinking water (Piped water, public tap, borehole, protected well, protected spring and rainwater) is 66% while 18% of households with improved sanitation (NDHS, 2013.). The communities in the local government area are categorized into three namely; the inner core, transitory and peripheral areas. The inner core areas form the old part of the city, inhabited majorly by indigenes with low level of education. These areas apart from being highly congested and overcrowded are characterized by poorly planned housing, absence of good drainage system, limited basic amenities, and many other public health problems. The transitional communities which interface between the inner core and the elite areas have little or no space for further expansion. The periphery communities are mostly the elite areas occupied by high-income groups and are characterized by well-planned housing system, modern amenities and more space for further development (Arulogun and Adefioye, 2010).

This study was carried out in Ibadan North West area due to the fact that this area was mostly hit by cholera between May and December, 2011. The study site involved the three stratified communities in the Local Government; 7 inner core, 4 transitory and 4 peripheral communities.

3.2 Study design: This was a cross sectional descriptive study conducted in IBNW LGA between March and April 2012 which used both quantitative and qualitative data collection technique.

3.3 Study population: The study population consisted of household members aged between 18 and 65 years of both sexes.

Inclusion criteria

- Should be within the age bracket 18-65 years
- Must be resident in either one of the three stratified communities in IBNWLGA for at least a year

Exclusion criteria

- Respondents who do not give informed consent

3.4 Sample size determination: From previous cross-sectional study on the knowledge, attitude and preventive practices relating to cholera in Dhaka Bangladesh (Waheed e tal., 2013), the prevalence of knowledge in the population was 46%. Considering an estimate of 46% knowledge level, with 5% precision of error, 95% confidence and 80% power, the sample size was 381. Taking into account 10% non-response rate, the sample size calculated is 423. The sample size formula for simple proportion study was used for the calculation of sample size (Daniel, 1999.; Lwanga and Lemeshow, 1991).

$n= Z^2_{\alpha} p (1-p)/d^2$

Where n=sample size p=expected prevalence d= precison and Z=standard normal deviate using 95% confidence level.

P=0.46, d=0.05, Z^2_{α}=1.96

N=1.96^2x0.46 (1-0.46)/0.05^2= 381 respondents, assuming 10% non- response rate value equals 423 respondents.

3.5 Sampling Technique: A multistage random sampling technique method was employed. In the first stage, Ibadan North West Local Government was stratified into three groups of communities (inner core, transitory and peripheral communities). This gave a total of 28 inner core, 15 transitory and 17 peripheral communities (Arulogun and Adefioye, 2010). This ratio was used to estimate the sample size for each stratum thus giving a sample size of 199,107 and 121 for the inner core, transitory and peripheral communities, respectively. A quarter of the communities in each stratum were randomly selected giving 7 communities from the inner core, 4 from transitory and 4 from peripheral. The sample size assigned to each stratum was divided among communities in each stratum based on size proportion to number of population in the community (Table 3.1).

In sampling households in the selected communities the following procedures were used. First household for the interviews were selected by going to the center of the community and select a direction by spinning a bottle. All households in the selected direction were counted and numbered on pieces of paper. One of the community members was requested to pick one piece of paper after being mixed. The number indicated on the piece of paper was the first household for starting the interviews. Subsequent households were selected

by going to the next household on the right hand side of the main entrance and a household from that direction was taken until the required number of households was reached. Interviews were conducted with the head of household or any senior member available at the time of interview. For this study a household was defined as people living together as a family and eating from the same pot (Ian, 2012).

Table 3.1: Sampling procedure for the selection of households from Ibadan Northwest Local Government Area.

Variables	**STRATUM**		
	Inner core	Transitory	Peripheral
Number of communities	28	15	17
Sample size proportionate to the number of community	199	107	121
Quarter of community selected	7	4	4
Total households in each community selected	Alekuso=3,219 Bere= 1991 Idikan=2,500 Asukuna=2,842 Atowoda=1420 Ayeye=10,139 Inalende=6,029	Ode-Oloo=1959 Ekotedo=13,176 Eleyele=21,872 Omitowoju=2,345	Afonta=2,400 Obokun=2,300 Olopomewa=3,385 Adetokun=485
Sample size based on proportion to size	Alekuso=23 Bere= 14 Idikan=18 Asukuna=20 Atowoda=10 Ayeye=72 Inalende=42	Ode-Oloo=5 Ekotedo=36 Eleyele=59 Omitowoju=7	Afonta=34 Obokun=32 Olopomewa=47 Adetokun=7

3.6 Data collection procedure: Data collection was accomplished through the use of a semi-structured questionnaire (See Appendix 1, Page 104-118) administered by three trained interviewer. The questionnaire was developed by researcher and thereafter pre-tested among residents of another community in a location called Yemetu in Ibadan North Local Government sharing similar characteristics with the study area. The questionnaire was developed by consulting relevant literature and adoption of questions on vulnerability and severity from past studies (Rubin e tal. 2009; Tang and wong 2004) after which it was translated to Yoruba Language and back translated to English Language.

The questionnaire was validated by two experts and 2 post-graduate students. The questionnaire was divided into seven sections; the first section included information on socio-demographic characteristics, section two had questions on knowledge of cholera, section three had questions on hygiene practices regarding cholera, section four with questions on source of information during a cholera outbreak, section five included perceived vulnerability and severity questions, section six had questions on the case study of cholera and section seven had questions on attitude to reporting and investigation of cholera outbreak.

3.7 Data management and analysis

All questionnaires were checked daily for completeness after the interview. For this study, data was managed using the Statistical Package for Social Science (SPSS) version 14 for windows and analysed using descriptive, bivariate and multivariate statistics. The results were presented using tables and charts. Descriptive statistics (frequencies, proportions, means and percentages) were used to describe some socio-demographic

variables such as age, sex, occupation, type of community, tribe and marital status. Chi square test was used to establish relationships between categorical dependent variables such as knowledge of cholera, risks factors regarding cholera, risk perception, attitude to reporting of cholera outbreak and socio-demographic variables. Logistic regression was also used to determine independent factors affecting perceived vulnerability and severity to cholera outbreak. Statistical significance was set at $p \leq 0.05$.

Measurement of knowledge

Responses to statements on cholera knowledge was dichotomous (agree or disagree). A 19 point scale was used in measuring knowledge, whereby each item was scored correct or wrong and awarded a point then scores were added. For each correct answer a score of one point was given, a score of zero was given for a wrong answer. A cut off point for poor knowledge was fixed at ≤10 score and a score of ≥11 points or more was fixed for good knowledge. Questions included knowledge on how cholera is transmitted, symptoms of cholera, how cholera is prevented, risks factors for cholera and the signs and symptoms.

Measurement of perceived vulnerability to cholera outbreak

Three items were used to assess how people perceived their vulnerability to cholera outbreak.15-point likert scale was used in measuring the perceived vulnerability to cholera outbreak. Perceived vulnerability items were phrased as statements, with response option ranging from strongly agree (5) to strongly disagree (1). Three statements relevant to perception included "the current state of the environment I live in

makes my community prone to cholera", "I think that there is a high likelihood of my family been infected with cholera in the nearest future" and "I think that there is a high likelihood of been infected with cholera in the nearest future". A total of 15 points were obtainable, cut off point for low perceived vulnerability was fixed at ≤ 7 and a score of ≥8 was given for high perceived vulnerability.

Measurement of perceived severity to cholera outbreak

Five items were used to assess the perceived severity to cholera outbreak. A 25-point likert scale was used in measuring the perceived severity to cholera outbreak. Perceived severity items were phrased as statements, with response option ranging from strongly agree (5) to strongly disagree (1) for the first three statements and strongly agree (1) to strongly disagree (5) for the last two statement because they were negative statements. The first three statements on perception were, "cholera infection kills rapidly", "cholera infection is a serious disease that could endanger life within hours" and " a person infected with cholera can infect many other people within hours". While the last two statements were "people easily recover from cholera without treatment" and "cholera is not a serious disease". A total of 25-points were obtainable, cut off point for low perceived severity was fixed at ≤ 12 and a score of ≥13 was given for high perceived severity.

Identifying Hygiene Practices

The proportion of respondents with correct response to questions on hygiene practices were used to assess practice. Practice was not on a scale of points

Measurement of attitudes

A 24 point likert scale was used in measuring attitude. Eight opinion statements relevant to attitude towards reporting outbreaks were employed. Respondents were requested to indicate the extent to which they agree or disagree with the statements. The attitudinal level was assessed by assigning three points to a response that indicated positive attitude and zero mark was given to any response that indicated negative attitude as well as the undecided responses. A total of 24-points were obtainable, respondents that scored ≤12 points were categorized as having negative attitude while those with ≥13 points were categorized as having positive attitude.

Case Study Analysis

Case study was conducted on five cases from the last outbreak of cholera in the community identified during the survey to shed more light on the attitude and control practice regarding cholera. For the purpose of the case control study, a probable case was defined as three or more watery stools in 24hrs in a person at least 5 years of age. A confirmed case met the definition for a probable case but had a stool culture positive for vibrio cholera 01 (Hutin *et al*., 2003). Only a probable or confirmed case within last year outbreak was eligible for the study. Questions asked to identify a case were: "there was a cholera outbreak in your Local Government Area Last year", "was there a case in your

compound"? If respondent answer 'Yes' to this question, the case is identified and a case study was carried out using a case study guide (See Appendix 3, Page 119-120). Questions on the case study guide included; clinical description of the illness, how the person became infected, if admitted, the treatment given and the outcome of the treatment.

Dependent Variables

The primary dependent variable were:

- Perceived severity and Perceived vulnerability to cholera outbreak. Perceived severity was categorise into two (high perceived severity and Low perceived severity). Also perceived vulnerability was categorise into two (high perceived vulnerability and low perceived vulnerability).
- Attitude to reporting of cholera outbreak among residents. Attitude to reporting was categorise into two (positive attitude and negative attitude)

Independent variable

- Socio-demographic characteristics of respondents (age, marital status, occupation, stratum and highest level of education).

3.8 Operational definition

Inner-core community: These communities comprise of indigenes of Ibadan North West and it is a slum-like community (Arulogun and Adefioye, 2010).

Transitory community: This community interface between the inner core and the elite areas (Arulogun and Adefioye, 2010)

Peripheral community: These are the elite areas occupied by high income groups and have a well planned housing system, modern amenities and more space for development (Arulogun and Adefioye, 2010).

Household: People living together as a family and eating from the same pot (Ian Macrory, 2012).

Developing Countries: Countries that have not achieved a significant degree of industrialization relative to their population and have a medium to low standard of living.

3.9 Ethical Considerations

This study was reviewed and approved by the Oyo State, Research Ethical Review Committee (See Appendix 4, Page 121). Participation in the survey was completely voluntary. Confidentiality of the information given by the participants was assured and names were substituted with codes. Verbal informed consent was obtained from each respondent before the questionnaire was administered. Permission was also obtained from the head of household.

CHAPTER 4

RESULT

4.1 Socio-demographic characteristics of the respondents

A total of 427 respondents who have heard about cholera were interviewed, of this number, (46.6%) were from the inner core community and (70.7%) were females. Age of the respondents ranged from 18 to 65 years with a mean ±SD age of 35.1± 11.4 years and (44.0%) were in the 18-30 year age group. Most of the respondents were self-employed (67.2%). The distribution of the respondents by educational qualification showed that (38.2%) had senior secondary school as their highest educational qualification while (7.5%) had no formal education. Majority (93.4%) of the respondents were Yoruba and (57.1%) were Muslims (Table 4.1).

TABLE 4.1: Socio-demographic characteristics of the respondents. N=427

Characteristics	n	%
Stratum		
Inner-core community	199	46.6
Peripheral community	121	28.3
Transitory community	107	25.1
Age group (years)		
18-30	188	44.0
31-43	148	34.7
44-56	61	14.3
57+	30	7.0
Sex		
Male	125	29.3
Female	302	70.7
Highest level of education		
No formal education	32	7.5
Primary	86	20.1
Junior secondary	56	13.1
Senior secondary	163	38.2
Tertiary	90	21.1
Type of work		
Professional	10	2.3
Retired	13	3.0
Civil servant	30	7.0
Unemployed	38	8.9
Students	43	10.1
Self employed	287	67.2
Religion		
No religion	1	0.2
Traditional	2	0.5
Christianity	180	42.2
Islam	244	57.1
Tribe		
Hausa	1	0.2
Igbo	18	4.2
Yoruba	399	93.4
Others	9	2.1
Marital status		
Seperated	7	1.6
Divorced	10	2.3
Widowed	16	3.7
Single	99	23.2
Married	295	69.1

4.2 Knowledge of cholera among respondents

Two hundred and four (47.8%) of the respondents correctly agreed that cholera is mostly found in the developing countries. More respondents (78.2%) correctly identified cholera as an infectious disease. Four hundred and fifteen (97.2%) reported watery stool and (96.3%) vomiting as the primary indicator of cholera illness. Three hundred and five (71.4%) agreed that the causative agent of cholera is transmitted through food and water, 57.6% were of the opinion that cholera is transmitted through insect bite, 50.5% that cholera can be transmitted by shaking hands with infected persons. Four hundred and six (95.1%) correctly associated unhygienic environment as a risk factor for cholera while 71.4% identified eating cold and left –over food as a risk factor for cholera. Most respondents (95.6%) agreed that good personal hygiene is a primary method of preventing cholera while 60.0% agreed that the technique available for detecting cholera is through the stool test. The distribution of the composite score for cholera knowledge showed that 95.3% of the respondents had good knowledge of cholera while 4.7% had poor knowledge (Table 4.2).

Table 4.2: Distribution of responses to questions on cholera knowledge among respondents

Variable	Agree n (%)	Disagree n (%)
Cholera is mostly found in developing countries	204(47.8)	223(52.2)
People living in an unhygienic environment are more at risk of having cholera	406(95.1)	21 (4.9)
Cholera is highly preventable	388(90.9)	39(9.1)
Cholera can be passed from one person to another	334(78.2)	93(21.8)
You can get infected with cholera, if you eat or drink contaminated food and water	349(81.7)	78(18.3)
Constant washing of hands with soap and clean water can prevent cholera infection	393(92.0)	34(8.0)
Good personal hygiene is a primary method of preventing cholera	408(95.6)	19(4.4)
You can get infected with cholera by shaking hands with an infected person	190(44.5)	237(55.5)
Defecating indiscriminately can lead to cholera	394(92.3)	33(7.7)
You can be infected with cholera , if you share toilets with an infected person	334(78.2)	93(21.8)
Cholera is not transmitted through insect bite	181(42.4)	246(57.6)
Vomiting is a symptom of cholera	411(96.3)	16(3.7)
Technique available for detecting cholera is through stool test	256(60.0)	171(40.0)
Watery stool is a symptom of cholera	415(97.2)	12(2.8)
Cholera infection kills	415(97.2)	12(2.8)
Cholera infection can be treated	421(98.6)	6(1.4)
The causative agent of cholera is transmitted through food and water	305(71.4)	122(28.6)
Eating cold and left-over food is a risk factor for cholera	305(71.4)	122(28.6)
Eating food prepared outside the home is a risk factor for cholera	347(81.3)	80(18.7)

4.3 Association between cholera knowledge and socio-demographic characteristics of respondents

More of the respondents residing in the peripheral community 99.2% had good knowledge of cholera compared to respondents in inner core (94.5%) and transitory (92.5%).This was statistically significant (p=0.02). A higher proportion of respondents who had junior secondary school education (98.2%) as their highest level of education had good knowledge compared with primary school (94.2%), senior secondary (95.1%), tertiary (97.8%) and those with no formal education (87.5%) (p=0.16). More Christians (97.2%) had good knowledge of cholera compared to muslims (93.9%) (p=0.28). Furthermore the study revealed that more respondents in the age group 31 and 43 years had good knowledge of cholera (97.3%) compared to those 57 years and above (90.0%) (p=0.23). The distribution of respondent's cholera knowledge by occupation showed that all those who were professionals and the civil servants had good knowledge of cholera. This finding was not statistically significant (p=0.72) (Table 4.3).

TABLE 4.3: Frequency distribution of cholera knowledge by socio-demographic characteristics of respondents

Characteristics	Poor knowledge N=20	Good knowledge N=407	Total	χ^2	Fisher's Exact	p-value
Age group						
18-30	9 (4.8)	179 (95.2)	188 (100)		4.069	0.233
31-43	4 (2.7)	144 (97.3)	148 (100)			
44-56	4 (6.6)	57 (93.4)	61 (100)			
57+	3 (10.0)	27 (90.0)	30 (100)			
Gender						
Male	6 (4.8)	119 (95.2)	125 (100)	0.005		0.942
Female	14 (4.6)	288 (95.4)	302 (100)			
Type of community						
Inner core	11 (5.5)	188 (94.5)	199 (100)		7.037	0.024*
Transitory	8 (7.5)	99 (92.5)	107 (100)			
Peripheral	1 (0.8)	120 (99.2)	121 (100)			
Highest level of education						
Primary	5 (5.8)	81 (94.2)	86 (100)		6.003	0.163
Junior secondary school	1 (1.8)	55 (98.2)	56 (100)			
Senior secondary school	8 (4.9)	155 (95.1)	163 (100)			
Tertiary	2 (2.2)	88 (97.8)	90 (100)			
No formal education	4 (12.5)	28 (87.5)	32 (100)			
Religion						
Christianity	5 (2.8)	175 (97.2)	180 (100)		4.702	0.275
Islam	15 (6.1)	229 (93.9)	244 (100)			
Traditional	0 (0)	3 (100)	3 (100)			
Tribe						
Igbo	0 (0)	28 (100)	28 (100)		1.563	1.000
Yoruba	20 (5.0)	379 (95.0)	399 (100)			
Marital status						
Single	3 (3.0)	96 (97.0)	99 (100)		1.201	0.795
Married	17 (5.8)	278 (94.2)	295 (100)			
Separated	0 (0)	7 (100)	7 (100)			
Divorced	0 (0)	10 (100)	10 (100)			
Widowed	0 (0)	16 (100)	16 (100)			
Occupation						
Professional	0 (0)	10 (100)	10 (100)		2.403	0.719
Civil servant	0 (0)	30 (100)	30 (100)			
Unemployed	2 (5.3)	36 (94.7)	38 (100)			
Students	1 (2.4)	41 (97.6)	42 (100)			
Self employed	16 (5.6)	272 (94.4)	288 (100)			
Retired	1 (7.7)	12 (92.3)	13 (100)			
Others	0 (0)	6 (100)	6 (100)			

*=significant at $p< 0.05$; Others = Apprentices

4.4 Sources of information on cholera

Majority of respondents (60.4%) obtained information through friends, (52.9%) through the media, (31.7%) in the schools, (28.6%) through campaigns and (21.7%) through health workers (Table 4.4).

Table 4.4 Sources of information on cholera

Source of information	n(%)
Through friends	258(60.4)
Media/posters	226(52.9)
School	135(31.7)
Through campaigns	122(28.6)
Health workers	93(21.7)
Others	23(4.6)

Note: multiple responses

Others: Church, mosques, buses and society meetings

4.5 Practices related to cholera infection

The frequency distribution of practices related to cholera infection among respondents showed that (69.8%) of the respondents ate food prepared outside the home, (37.9%) ate cold left-over food prepared from previous day and (61.1%) treat their water before drinking (Table 4.5). Frequency distribution of types of drinking water showed that (31.9%) drank water from bore hole, (55.3%) took sachet water, (37.2%) drank rain water and (28.3%) from shallow well water. With regard to technique involved in treating drinking water only (5.4%) added table salt, (6.6%) boiled water, (19.7%) sieved, (38.8%) used alum and (45.0%) used water guard.

Most (95.1%) of the respondents had toilet facility in their house. Out of the (95.1%) who had toilet facility in their house, (46.1%) had modern toilet, (37.2%) pit latrine, (11.2%) used chamber pot and (5.4%) defecated in the bush or open dump site. Four hundred and three (94.4%) respondents mentioned they washed their hands all the time after leaving the toilet and (72.6%) used water and soap for hand washing after visiting the toilet. Majority (95.1%) of the respondents washed their hands before taking meals; of which (82.1%) used only water for hand washing compared to (17.9%) who used water and soap. Three hundred and nine (72.5%) mentioned they washed their fruits all the time before eating (Table 4.5).

TABLE 4.5. Frequency distribution of hygiene practices related to cholera infection among respondents

Characteristics	n (%)
Eat outside (N=427)	298 (69.8)
Eat cold left-over food from previous day (N=427)	165 (37.9)
Type of drinking water (N=427)(multiple responses)	
Sachet water	236 (55.3)
Rain water	159 (37.2)
Bore-hole wells	136 (31.9)
Shallow wells	121 (28.3)
Treat drinking water (N=427)	261 (61.1)
How water was treated for drinking(N=261)(multiple responses)	
Use water guard	116 (45.0)
Added alum	100 (38.8)
Sieving	52 (19.7)
Boiling	17 (6.6)
Added table salt	23 (5.4)
Have a toilet in the house (N=427)	406 (95.1)
Feacal disposal method (N=406)	
Modern toilet	197 (46.1)
Pit latrine	159 (37.2)
Chamber pot	48 (11.2)
Bush or open dump	23 (5.4)
How often hands were washed after leaving the toilet (N=427)	
All the time	403 (94.4)
Not all the time	24 (5.6)
What hands were washed with after leaving the toilet (N=427)	
Water and soap	310 (72.6)
Water only	115 (26.9)
Ash and water	2 (0.5)
How often hands were washed before taken any meal (N=427)	
All the time	405 (95.1)
Not all the time	21 (4.9)
What hands were washed with before taken any meal (N=427)	
Water only	348 (82.1)
Water and soap	76 (17.9)
How often fruits were washed before eating(N=427)	
All the time	309 (72.5)
Not all the time	113 (26.5)
I don't wash my fruits	4 (0.9)

4.5.1 Relationship between knowledge of cholera and hygiene practices related to cholera infection among respondents.

Most respondents (70.5%) with good knowledge of cholera ate food prepared outside and about (37.6%) ate cold left-over food from previous day. Out of the (95.3%) respondents with good knowledge of cholera, (61.2%) treated their water before drinking. The distribution of respondents with good knowledge of cholera by drinking water showed that (55.0%) respondents mentioned they drank sachet water, (36.4%) rain-water, (31.2%) deep well and (28.7%) shallow well water. Among the respondents with good knowledge of cholera, (46.2%) mentioned they treated their drinking water with water-guard, (36.8%) alum, (19.4%) sieved the water and (6.9%) boiled their drinking water. More respondents (63.2%) with good knowledge of cholera did not treat their drinking water with alum. Statistical significant relationship was demonstrated between knowledge of cholera and the use of alum for the treatment of drinking water (p=0.003).

Three hundred and eighty-eight (95.3%) respondents with good knowledge of cholera had a toilet in their house. Furthermore, most respondent with good knowledge of cholera washed their hands after leaving the toilet (94.8%); of which (72.7%) washed their hands with soap and water. Among respondents with good knowledge of cholera, (95.3%) washed their hand all the time before taking any meal, (82.2%) wash their hands with water only and (73.2%) wash fruits before eating. These were not statistically significant when compared with those with poor knowledge. (Table 4.6)

TABLE 4.6a: Relationship between knowledge of cholera and hygiene practice related to cholera infection

Characteristics	Poor knowledge N=20	Good knowledge N=407	χ^2	p-value
Eat cold leftover food from previous day				
Yes	9 (45.0)	153 (37.6)	0.444	0.505
No	11 (55.0)	254 (62.4)		
Drinking water-Deep well				
Yes	9 (45.0)	127 (31.2)		
No	11 (55.0)	280 (68.8)	1.672	0.196
Drinking water- shallow well				
Yes	4 (20.0)	117 (28.7)		
No	16 (80.0)	290 (71.3)	0.718	0.397
Drinking water-Sachet water				
Yes	12 (60.0)	224 (55.0)		
No	8 (40.0)	183 (45.0)	0.190	0.663
Drinking water -Rain water				
Yes	11 (55.0)	148 (36.4)		
No	9 (45.0)	259 (63.6)	2.833	0.092
Treat your drinking water				
Yes	12 (60.0)	249 (61.2)		
No	8 (40.0)	158 (38.8)	0.011	0.916
Treat your drinking water-Alum				
Yes	9 (81.8)	91 (36.8)		
No	2 (18.2)	156 (63.2)	8.975	0.003*
Treat your drinking water- Boiling				
Yes	0 (0)	17 (6.9)		
No	11 (100.0)	230 (93.1)	0.810	0.368
Treat your drinking water-Sieving				
Yes	1 (9.1)	48 (19.4)		
No	10 (90.9)	199 (80.6)	0.732	0.392

*=Significant at $p<0.05$

TABLE 4.6b: Relationship between knowledge of cholera and hygiene practice related to cholera infection

Characteristics	Poor knowledge N=20	Good knowledge N=407	χ^2	p-value
Treat your drinking water-Water guard				
Yes	2 (18.2)	114 (46.2)		
No	9 (81.8)	133 (53.8)	3.330	0.068
Have a toilet in your house				
Yes	18 (90.0)	388 (95.3)		
No	2 (10.0)	19 (4.7)	1.159	0.282
How often hands were washed after leaving the toilet				
All the time	18 (90.0)	385 (94.8)	0.870	0.351
Not all the time	2 (10.0)	21(5.2)		
What hands were washed with after leaving the toilet				
Water	6 (30.0)	109 (26.8)		
Water and soap	14 (70.0)	296 (72.7)	0.191	0.909
Ash and water	0 (0)	2 (0.5)		
How often were hands washed before taking meals				
All the time	18 (90.0)	387 (95.3)	1.151	0.283
Not all the time	2 (10.0)	19 (4.7)		
What hands were washed with before taking any meals				
Water	16 (80.0)	332 (82.2)	0.061	0.804
Water and soap	4 (20.0)	72 (17.8)		

*=Significant at $p<0.05$

4.6 Respondents sources of information during a cholera outbreak

Most of the respondents reported radio (38.6%) as the main sources of information during an outbreak of cholera. This was followed by television (22.7%), friends (16.9%), neighbours (5.4%), health workers (4.7%) and newspapers (2.6%) (Table 4.7)

TABLE 4.7 Respondents main source of information during a cholera outbreak

Source of information	n	%
Radio	165	38.6
Television	97	22.7
Friends	72	16.9
Others	39	9.1
Neighbours	23	5.4
Health workers	20	4.7
Newspaper	11	2.6
Total	**427**	**100**

Note: others include mosques, churches, markets places and inside buses.

4.6.1 Respondents opinion on important information to know when there is an outbreak of cholera

Frequency distribution of respondents' multiple responses on the important information to know when there is an outbreak of cholera showed that most respondents mentioned" where to report cases" (74.2%), "what to do to prevent outbreak from affecting me and my household" (64.6%), "how to recognize the symptoms of the disease" (59.7%), "how the disease is treated" (55.7%) and "how the disease is transmitted" (46.6%) as the most important information to know when there is an outbreak of cholera. (Table 4.8)

Table 4.8 Frequency distribution of respondent's responses on the important information to know when there is an outbreak of cholera. N=427

Important information to know	n (%)
"Where to report cases"	317 (74.2)
"What to do to prevent it from affecting me and my household"	276 (64.6)
"How to recognize the symptoms of the disease"	255 (59.7)
"How the disease is treated"	238 (55.7)
"How the disease is transmitted"	199 (46.6)

Note: Multiple responses

4.7 Respondents perceived vulnerability to cholera outbreak

Table 4.9 shows the perception of vulnerability to cholera outbreak among respondents. Overall 192 (45.0%) of the respondents agreed that the current environment they lived in makes their community prone to cholera outbreak. About (32.6%) thought that there is a high likelihood of their family been infected with cholera in the nearest future. However (30.3%) respondents believed that there is a high likelihood of been infected with cholera in the nearest future.

TABLE 4.9 Perceived vulnerability to cholera outbreak among respondents

Perceived vulnerability	Agree n(%)	Disagree n(%)	Total n(%)
The current state of the environment I live in makes my community prone to cholera.	192 (45.0)	235 (55.0)	427 (100.0)
I think that there is a high likelihood of my family been infected with cholera in the nearest future.	139 (32.6)	288 (67.4)	427 (100.0)
I think that there is a high likelihood of me been infected by cholera in the nearest future.	129 (30.3)	298 (69.7)	427 (100.0)

Multiple responses

4.7.1 Association between perceived vulnerability to cholera outbreak and socio-demographic characteristics of respondents.

Analysis of the respondents perceived vulnerability to cholera outbreak by socio-demographic characteristics showed that (62.3%) had low perceived vulnerability to cholera outbreak . A higher proportion (94.2%) of respondents residing in the peripheral community did not perceived themselves to be vulnerable to cholera outbreak compared to respondents in inner core (35.7%) and transitory (75.7%).This was statistically significant ($p<0.001$).

Significantly, more respondents who had tertiary education as their highest educational qualification (83.3%) had perceived their vulnerability to cholera outbreak to be low compared to other educational backgrounds ($p<0.001$). More Christians (73.3%) had perceived their vulnerability to cholera outbreak to be low compared to muslims (54.1%), and this was statistically significant ($p<0.001$). Furthermore the study revealed that more respondents between the age group of 44 and 56 years (72.1%) did not perceived themselves vulnerable to cholera outbreak compared to respondents between the age group of 18 to 30 years (54.3%), 31 to 43 years (68.9%), and 57 years and above (60.0%). This was statistically significant ($p=0.015$).(Table 4.10)

TABLE 4.10 Distribution of Perceived vulnerability to cholera by socio-demographic characteristics of respondents.

Characteristics	Low Perceived Vulnerability	High Perceived Vulnerability	Total	χ^2	Fisher's exact	p-value
Age group						
18-30	102 (54.3)	86 (45.7)	188 (100.0)	10.518		0.015*
31-43	102(68.9)	46 (31.1)	148 (100.0)			
44-56	44 (72.1)	17 (27.9)	61 (100.0)			
57+	18 (60.0)	12 (40.0)	30 (100.0)			
Total	**266 (62.3)**	**161 (37.7)**	**427 (100.0)**			
Marital status						
Separated	11 (64.7)	6(35.3)	17 (100.0)		12.418	0.006*
Widowed	13 (81.3)	3(18.8)	16 (100.0)			
Single	74 (74.7)	25 (25.3)	99 (100.0)			
Married	168 (56.9)	127 (43.1)	295 (100.0)			
Total	**266 (62.3)**	**161 (37.7)**	**427 (100.0)**			
Religion						
None	1 (100.0)	0 (0.0)	1 (100.0)		18.197	0.000*
Christianity	132 (73.3)	48 (26.7)	180 (100.0)			
Islam	132 (54.1)	112 (45.9)	244 (100.0)			
Traditional	1 (50.0)	1 (50.0)	2 (100.0)			
Total	**266 (62.3)**	**161 (37.7)**	**427 (100.0)**			
Occupation						
Civil servant	26 (86.7)	4 (13.3)	30 (100.0)		35.997	0.000*
Students	36 (85.7)	6 (14.3)	42 (100.0)			
Unemployed	31 (81.6)	7 (18.4)	38 (100.0)			
Retired	10 (76.9)	3 (23.1)	13 (100.0)			
Professional	6 (60.0)	4 (40.0)	10 (100.0)			
Self employed	153 (53.1)	135 (46.9)	288 (100.0)			
Total	**262 (62.2)**	**159 (37.8)**	**421 (100.0)**			
Community						
Inner core	71(35.7)	128 (64.3)	199 (100.0)			
Transitory	81 (75.7)	26 (24.3)	107 (100.0)	120.696		0.000*
Peripheral	114 (94.2)	7 (5.8)	121 (100.0)			
Total	**266 (62.3)**	**161 (37.7)**	**427 (100.0)**			
Highest level of education						
No formal education	17 (53.1)	15 (46.9)	32 (100.0)			
Primary	44 (51.2)	42 (48.8)	86 (100.0)	25.283		
Junior secondary	29 (51.8)	27 (48.2)	56 (100.0)			0.000*
Senior secondary	101 (62.0)	62 (38.0)	163 (100.0)			
Tertiary	75 (83.3)	15 (16.7)	90 (100.0)			
Total	**266 (62.3)**	**161 (37.7)**	**427 (100.0)**			

*= Significant at p<0.05

4.8 Respondent's perceived seriousness of cholera outbreak

Table 4.11 shows the perception of seriousness of cholera outbreak among respondents. Overall (92.3%) respondents agreed that cholera infection kills rapidly. About (91.8%) were of the opinion that cholera infection is a serious disease that could endanger life within hours while (71.1%) agreed that a person infected with cholera can infect many other people within hours. However (8.0%) were of the opinion that people easily recover from cholera without treatment. A high proportion of the respondents (82.4%) disagreed that cholera is not a serious disease.

TABLE 4.11 Perceived seriousness of cholera outbreak among respondents. N=427

Seriousness of cholera outbreak	Agree n(%)	Disagree n(%)	Total n(%)
Cholera infection kills rapidly	393 (92.3)	34 (7.7)	427 (100)
Cholera infection is a serious disease that could endanger life within hours.	391 (91.8)	36 (8.2)	427 (100)
A person infected with cholera can infect many people within hours.	303 (71.1)	124 (28.9)	427 (100)
People easily recover from cholera without treatment.	34 (8.0)	393 (92.0)	427 (100)
Cholera is not a serious disease.	75 (17.6)	352 (82.4)	427 (100)

Multiple responses

4.8.1 Association between perceived seriousness of cholera outbreak and socio-demographic characteristics of respondents.

A higher proportion of male (99.2%) perceived the seriousness of cholera outbreak to be high compared to their female counterpart 295 (97.7%). There was a significant relationship between age group and perceived seriousness to cholera outbreak (p=0.02). Perceived seriousness of cholera outbreak was highest among those in the age group of 31 to 43years (100%) and 44 to 56years (100%) compared to other age groups. A significant relationship exist between perceived seriousness and type of community (p =0.05). All respondents residing in the peripheral community (100%) perceived cholera outbreak to be very serious compared to transitory (99.1%) and inner core (96.5%) dwellers. Four hundred and nineteen (98.1%) of respondents perceived seriousness of cholera outbreak to be high compare to (1.9%) who had low perceived seriousness to cholera outbreak. (Table 4.12).

TABLE 4.12 Association between perceived seriousness to cholera by socio-demographic characteristics of respondents.

Characteristics	Low Perceived seriousness N=8	High Perceived seriousness N= 419	Total	χ^2	Fishers Test	P-value
Gender						
Male	1 (0.8)	124 (99.2)	125 (100.0)		-	0.447
Female	7 (2.3)	295 (97.7)	302 (100.0)			
Total	**8 (1.9)**	**419 (98.1)**	**427 (100.0)**			
Age group						
18-30	6 (3.2)	182 (96.8)	188 (100.0)		8.685	0.017*
31-43	0 (0)	148 (100.0)	148 (100.0)			
44-56	0 (0)	61 (100.0)	61 (100.0)			
57+	2 (6.7)	28 (93.3)	30 (100.0)			
Total	**8 (1.9)**	**419 (98.1)**	**427 (100.0)**			
Community						
Inner core	7 (3.5)	192 (96.5)	199 (100.0)		4.991	0.047*
Transitory	1 (0.9)	106 (99.1)	107 (100.0)			
Peripheral	0 (0)	121 (100.0)	121 (100.0)			
Total	**8 (1.9)**	**419 (100.0)**	**427 (100.0)**			
Highest level of education						
Primary	1 (1.2)	85 (98.8)	86 (100.0)		4.443	0.247
Junior secondary	3 (5.4)	53 (94.6)	56 (100.0)			
Senior secondary	2 (1.2)	161 (98.8)	163 (100.0)			
Tertiary	1 (1.1)	89 (98.9)	90 (100.0)			
No formal education	1 (3.1)	31 (96.9)	32 (100.0)			
Total	**8 (1.9)**	**419 (98.1)**	**427 (100.0)**			
Religion						
Christianity	4 (2.2)	176 (97.8)	180 (100.0)		4.024	0.742
Islam	4 (1.6)	240 (98.4)	244 (100.0)			
Traditional	0 (0)	2 (100.0)	2 (100.0)			
None	0 (0)	1 (100.0)	1 (100.0)			
Total	**8 (1.9)**	**419 (98.1)**	**427 (100.0)**			
Tribe						
Yoruba	8 (2.0)	391 (98.0)	399 (100.0)		2.182	1.000
Igbo	0 (0)	18 (100.0)	18 (100.0)			
Hausa	0 (0)	1 (100.0)	1 (100.0)			
Total	**8 (1.9)**	**410 (98.1)**	**418 (100.0)**			

*= Significant at $p<0.05$

4.9 Respondents' attitude towards reporting of cholera outbreak

Table 4.13 shows the frequency distribution of responses to questions on attitude towards reporting of cholera outbreak. Majority (76.1%) disagreed that reporting is not necessary during an outbreak of cholera. Two hundred and ninety-one (68.3%) respondents disagreed that reporting of cholera outbreak can lead to reprimanding the people infected and their family while (65.3%) disagreed that reporting of cholera outbreak can lead to reprimanding the community. More than half (61.3%) disagreed that reporting of cholera outbreak could bring stigma to a household while (71.2%) disagreed that reporting of cholera outbreaks could bring stigma to the community. Seventy-nine (18.5%) respondents believed that reporting of cholera outbreak is a waste of time and money while (25.5%) believed that a person who goes to report has put his/her community to shame. Many respondents (69.8%) agreed that prompt reporting of a case of cholera during an outbreak can reduce the spread of the disease.

TABLE 4.13 Respondents attitude to reporting of cholera outbreak

Statements	Agree n (%)	Disagree n (%)	Undecided Response n (%)	Total n (%)
Reporting is not necessary during a cholera outbreak.	93 (21.8)	325 (76.1)	9 (2.1)	427 (100)
Reporting of cholera outbreak can lead to reprimanding the people/family.	121 (28.3)	291 (68.1)	15 (3.5)	427 (100)
Reporting of cholera outbreak can lead to reprimanding the community.	121 (28.3)	278 (65.1)	28 (6.6)	427 (100)
Reporting of cholera can bring stigma to the household.	140 (32.8)	261 (61.1)	26 (6.1)	427 (100)
Reporting of cholera outbreak can bring stigma to the community.	100 (23.4)	304 (71.2)	23 (5.4)	427 (100)
Reporting of cholera outbreak is a waste of time and money .	79 (18.5)	325 (76.1)	23 (5.4)	427 (100)
A person who goes to report a case has put his/her community to shame.	109 (25.5)	302 (70.7)	16 (3.7)	427 (100)
Prompt reporting of a case in a cholera outbreak will reduce the spread of the disease.	298 (69.8)	116 (27.2)	13 (3.0)	427 (100)

4.9.1 Association between respondent's attitude to reporting of cholera outbreak and socio-demographic characteristics.

The mean attitudinal score was 16.80 ± 7.6. Three hundred and four (71.2%) had positive attitude to reporting of cholera outbreak while (28.8%) had negative attitude. Gender had no significant relationship with attitude (p=0.24). However as age increases respondents were more likely to have negative attitude to reporting of cholera outbreak. This was significant (p=0.016).More civil servants (86.7%) had positive attitude to reporting of cholera outbreak compared to students (83.3%), unemployed (73.7%), professional (70.0%), the self- employed (68.1%) and retiree (61.5%). This was not significant (p=0.13). Equal proportion of respondents residing in the peripheral community (76.9%) and transitory (76.6%) had positive attitude to reporting of cholera outbreak. This was statistical significant (p=0.03). There was no significant relationship between ethnic and attitude to reporting of cholera outbreak although more Igbo (83.3%) than Yoruba (70.2%) had positive attitude (p=0.147). More christians (77.8%) had positive attitude compared to muslims (66.4%). There was no significant relationship between marital status and attitude to reporting of cholera outbreak (p=0.95). (Table 4.14)

TABLE 4.14 Relationship between respondent's attitude to reporting of cholera outbreak and socio-demographic characteristics.

Characteristics	Negative attitude N=123	Positive attitude N=304	Total	χ^2	P-value
Gender					
Male	41 (32.8)	84 (67.2)	125 (100.0)	1.375	0.241
Female	82 (27.2)	220 (72.8)	302 (100.0)		
Total	**123 (28.8)**	**304 (71.2)**	**427 (100.0)**		
Age group					
18-30	43 (22.9)	145 (77.1)	188 (100.0)	10.335	0.016*
31-43	46 (31.1)	102 (68.9)	148 (100.0)		
44-56	19 (31.1)	42 (68.9)	61 (100.0)		
57+	15 (50.0)	15 (50.0)	30 (100.0)		
Total	**123 (28.8)**	**304 (71.2)**	**427 (100.0)**		
Community					
Inner core	70 (35.2)	129 (64.8)	199 (100.0)	7.376	0.025*
Transitory	25 (23.4)	82 (76.6)	107 (100.0)		
Peripheral	28 (23.1)	93 (76.9)	121 (100.0)		
Total	**123 (28.8)**	**304 (71.2)**	**427 (100.0)**		
Highest level of education	16 (50.0)	16 (50.0)	32 (100.0)	15.958	0.003*
No formal education	23 (26.7)	63 (73.3)	86 (100.0)		
Primary	18 (32.1)	38 (67.9)	56 (100.0)		
Junior secondary	52 (31.9)	111 (68.1)	163 (100.0)		
Senior secondary	14 (15.6)	76 (84.4)	90 (100.0)		
Tertiary	**123 (28.8)**	**304 (71.2)**	**427 (100.0)**		
Total					
Religion					
None	0 (0)	1 (100.0)	1 (100.0)	7.389	0.060
Traditional	1 (50.0)	1(50.0)	2 (100.0)		
christianity	40 (22.2)	140 (77.8)	180 (100.0)		
Islam	82 (33.6)	162 (66.4)	244 (100.0)		
Total	**123 (28.8)**	**304 (71.2)**	**427 (100.0)**		

*= Significant at $p<0.05$

4.9.2 Association between attitude to reporting of cholera outbreak by knowledge of cholera, perceived vulnerability and perceived seriousness to cholera outbreak.

Table 4.15 showed that equal proportion of respondents with good knowledge of cholera (71.3%) and poor knowledge (70.0%) had positive attitude to reporting of cholera outbreak. This was not statistically significant (p=0.904).

A higher proportion of respondents (73.7%) who had low perceived vulnerability to cholera outbreak had positive attitude to reporting of cholera outbreak compared to those who had high perceived vulnerability (67.5%). This was not significant (p=0.172).

A higher proportion of respondents (75.0%) who did not perceive cholera outbreak to be serious had positive attitude to reporting of cholera compared to those who perceived cholera outbreak to be serious (71.1%). This was not significant (p=0.81).

Table 4.15 Association between attitude to reporting of cholera outbreak by knowledge of cholera, perceived vulnerability and perceived seriousness to cholera outbreak.

Characteristics	Negative reporting attitude N=123	Positive reporting attitude N=304	Total	χ^2	p-value
Cholera Knowledge					
Poor knowledge	6 (30.0)	14 (70.0)	20(100)	0.015	0.904
Good knowledge	117 (28.7)	290 (71.3)	407(100)		
Perceived Vulnerability					
Low perceived vulnerability	70 (26.3)	196 (73.7)	266(100)	1.870	0.172
High perceived vulnerability	53 (32.5)	108 (67.5)	160(100)		
Perceived Severity					
Low perceived seriousness	2 (25.0)	6 (75.0)	8 (100)	0.058	0.810
High perceived seriousness	121 (28.9)	298 (71.1)	419 (100)		

4.10 Respondent's attitude to investigation during an outbreak of cholera

Two hundred and ninety-seven (69.6%) respondents reported that they will be friendly with investigator and interested in investigation , 15.7% mentioned that they will cooperate with the investigator but will not be particularly interested in the investigation, 9.1% will be impatient with the investigator while 2.6% will be hostile to the investigator. (Table 4.16)

Table 4.16 Frequency distribution of respondents' attitude to cholera outbreak investigation

Respondents' attitude to investigation	Frequency	Percent
Friendly and interested	297	69.6
Cooperative but not particularly interested	67	15.7
Impatient	39	9.1
Hostile	11	2.6
Others	13	3.0
Total	**427**	**100.0**

Others=Annoyed, afraid

4.11 Association between respondent's attitude to investigation during an outbreak of cholera and knowledge of cholera

A higher proportion (97.0%) of respondents who reported that they will cooperate with investigators but not particularly interested in the investigation had good knowledge of cholera compared to those who will be hostile to investigators (90.9%), impatient with investigators (89.7%) and those who will be friendly to investigators with interest in the investigation (95.6%). This was not significant (p= 0.31). (Table 4.17)

TABLE 4.17 Relationship between respondent's attitude to investigation during an outbreak of cholera and cholera knowledge.

Attitude to investigation	Poor Knowledge	Good knowledge	Total	χ^2	P-value
Friendly and interested	13 (4.4)	285 (95.6)	298 (100.0)	3.578	0.311
Cooperative but not particularly interested	2 (3.0)	65 (97.0)	67 (100.0)		
Impatient	4 (10.3)	35 (89.7)	39 (100.0)		
Hostile	1 (9.1)	10 (90.9)	11 (100.0)		
Total	**20**	**407**			

4.12 Association between attitude to investigation during an outbreak of cholera and Perceived vulnerability to cholera outbreak.

A higher proportion of respondents (39.4%) who reported they will be friendly with investigators and interested in investigation during an episode of cholera outbreak perceived themselves to be vulnerable to cholera outbreak compared to those who reported they will be hostile to investigators (36.4%), impatient to investigators (28.2%) and cooperative but not particularly interested in investigation (25.4%). This was not significant (p=0.12). (Table 4.18).

TABLE 4.18 Relationship between respondent's attitude to investigation during an outbreak of cholera and perceived vulnerability to cholera outbreak

Attitude to investigation	Low Perceived Vulnerability	High Perceived Vulnerability	Total	χ^2	P-value
Friendly and interested	180 (60.6)	117 (39.4)	297(100.0)	5.80	0.122
Cooperative but not particularly interested	50 (74.6)	17 (25.4)	67 (100.0)		
Impatient	28 (71.8)	11 (28.2)	39 (100.0)		
Hostile	7 (63.6)	4 (36.4)	11 (100.0)		
Total	**265**	**149**			

4.13 Association between attitude to investigation during an outbreak of cholera and Perceived seriousness to cholera outbreak.

Table 4.19 shows that equal proportion of respondents (98.7%) who reported that they will be friendly to investigators and interested in investigation of cholera outbreak, cooperative but not particularly interested in investigation (97.0%), impatient to investigation (97.4%) and hostile to investigators (100.0%) perceived cholera outbreak to be severe. This was not significant (p=0.74).

TABLE 4.19 Relationship between respondent's attitude to investigation during an outbreak of cholera and perceived seriousness to cholera outbreak

Attitude to investigation	Low perceived Seriousness	High Perceived Seriousness	Total	χ^2	P-value
Friendly and interested	4 (1.3)	294 (98.7)	298 (100.0)	1.264	0.738
Cooperative but not particularly interested	2 (3.0)	65 (97.0)	67 (100.0)		
Impatient	1 (2.6)	38 (97.4)	39 (100.0)		
Hostile	0 (0)	11 (100.0)	11 (100.0)		
Total	**7**	**408**	**415(100)**		

4.14 Factors influencing cholera knowledge

Respondents living in the inner core community were about 4.7 times less likely to have good knowledge of cholera compared to those living in the peripheral community (the reference community). This was statistically significant (OR 0.21; 95%CI 0.10-0.46). However respondents living in the transitory community were about 7.1 times less likely to have good knowledge of cholera compared to those staying in the peripheral community and this was statistically significant (OR 0.14; 95%CI 0.06-0.31).

4.15 Logistic regression analysis of socio demographic characteristics influencing perceived vulnerability to cholera outbreak among respondents.

Table 4.20 shows that respondents within the age group of 18 to 30 years were about 1.3 times more likely to perceive themselves vulnerable to cholera outbreak compared to respondents in the age group 57 years and above (Reference age category) but this was not significant (OR 1.29; 95%CI 0.36-4.59). Individuals within the age group of 31 to 43 years were about 1.8 times less likely to perceived themselves vulnerable to cholera outbreak compared to respondents in age group 57 years and above (OR 0.55; 95% CI 0.15-1.92). Respondents within the age group of 44 to 56 years were also about 2.3 times less likely to perceive themselves vulnerable to cholera outbreak compared to respondents in the age group 57 years and above (OR 0.43; 95%CI 0.12-1.50).

Singles were about 1.1 times more likely to perceived themselves vulnerable to cholera outbreak compared to those who are widowed (reference category), and this was not significant (OR 1.13; 95%CI 0.19-6.85). Respondents who were married were about 3.2 times more likely to perceive themselves vulnerable to cholera outbreak compared to respondent who were widowed (OR 3.21; 95%CI 0.63-16.36). Couples who were separated were about 2.5 times more likely to perceive themselves vulnerable to cholera outbreak compared to respondents who were widowed (OR 2.50; 95%CI 0.25-24.58). Divorcee were about 1.3 times more likely to perceive themselves vulnerable to cholera outbreak compared to respondent who were widowed (OR 1.35; 95% CI 0.12-15.57).

Christians were about 5.4 times less likely to have high perceived vulnerability to cholera outbreak compared to traditional worshippers (reference category). This was not

significant (OR 0.19; 95% CI 0.01-5.21). Also Muslims were about 4.3 times less likely to perceived themselves vulnerable to cholera outbreak compared to traditional worshippers (OR 0.23; 95% CI 0.01-6.51).

Professionals were about 1.9 times less likely to perceive themselves vulnerable to cholera outbreak compared to retirees (reference category) (OR 0.52; 95%CI 0.05-5.36). Civil servants were about 3.0 times less likely to perceive themselves vulnerable to cholera outbreak compared to retirees (OR 0.33; 95%CI 0.04-2.73). Respondents who were unemployed were about 2.3 times less likely to perceive themselves vulnerable to cholera outbreak compared to retirees (OR 0.43; 95%CI 0.06-3.14). Students were about 2.3 times less likely to perceived themselves vulnerable to cholera outbreak compared to retirees (OR 0.43; 95%CI 0.05-3.68). Respondents who were self- employed were about 1.4 times less likely to perceive themselves vulnerable to cholera outbreak compared to retirees. However this was not significant (OR 0.73; 95%CI 0.121-4.44).

Respondents who had primary education as their highest educational qualification were about 1.4 times more likely to perceive themselves vulnerable to cholera outbreak compared to respondents with no formal education (reference category) (OR 1.45; 95%CI 0.52-4.03). Those with junior secondary certificate were about 2.0 times more likely to perceive themselves vulnerable to cholera outbreak compared to respondents with no formal education (OR 2.00; 95%CI 0.61-6.54). Respondents who had senior secondary certificate as their highest educational qualification were about 1.6 times more likely to perceived themselves vulnerable to cholera outbreak compared to respondents with no formal education (OR 1.57; 95%CI 0.54-4.52). Respondents with tertiary education as their highest educational qualification were about 1.7 times more likely to

perceived themselves vulnerable to cholera outbreak compared to those with no formal education (OR 1.71; 95%CI 0.48-6.11).

Respondents residing in the inner core community were about 23.7 times more likely to perceive themselves vulnerable to cholera outbreak compared to respondents in the peripheral community (reference category). This was significant (OR 23.70; 95%CI 9.64-58.31). Respondents residing in the transitory community were about 5.4 times more likely to perceive themselves vulnerable to cholera outbreak compared to those in the peripheral community. This was significant (OR 5.38; 95%CI 2.12-13.63).

Summary: Of all the socio-demographic variables, the significant predictor of vulnerability was residence.

TABLE 4.20: Logistic regression analysis of socio demographic characteristics influencing perceived vulnerability to cholera outbreak among respondent

Characteristics	Odds ratio	95%CIOR
Age group		
18-30	1.287	0.361-4.591
31-43	0.545	0.154-1.926
44-56	0.429	0.122-1.503
57+ (Ref)		
Marital status		
Single	1.130	0.186-6.852
Married	3.213	0.631-16.361
Seperated	2.502	0.255-24.580
Divorced	1.348	0.117-15.567
Widowed (Ref)		
Religion		
None	0.000	0.000
Christianity	0.185	0.007-5.206
Islam	0.233	0.008-6.510
Traditional (Ref)		
Occupation		
	0.519	0.050-5.360
Professional	0.329	0.040-2.731
Civil servant	0.427	0.058-3.140
Unemployed	0.431	0.050-3.680
Students	0.733	0.121-4.436
Self employed		
Retired (Ref)		
Highest level of education		
Primary	1.449	0.521-4.027
Junior secondary	2.002	0.612-6.543
Senior secondary	1.567	0.543-4.521
Tertiary	1.706	0.476-6.111
No formal education (Ref)		
Type of Community		
Inner core	23.703	9.636-58.306*
Transitory	5.380	2.124-13.633*
Peripheral (Ref)		

*= Significant at 95% CI

4.16 Socio-demographic characteristics influencing attitude to reporting of cholera outbreak

Table 4.21 shows that respondents within the age group of 18 and 30 years were about 3.2 times more likely to have positive attitude to reporting of cholera outbreak compared to respondents in the age group of 57years and above (reference age category) and this was significant (OR 3.24; 95%CI 1.30-8.09). Individuals within the age group of 31 and 43 years were about 1.9 times more likely to have positive attitude to reporting of cholera outbreak compared to individuals in the age group of 57years and above and this was not significant (OR 1.89; 95%CI 0.77-4.64). Respondents in the age group of 44 to 56 years were about 2.2 times more likely to have positive attitude to reporting of cholera outbreak compared to individuals in the age group of 57 years and above. This was not significant (OR 2.24 ;95%CI 0.85-5.89).

Respondents living in the inner core community were about 1.72 less likely to have positive attitude to reporting of cholera outbreak compared to those in the peripheral community (the reference community). This was not significant (OR 0.58; 95%CI 0.32-1.04).Those living in the transitory community were about 1.1 times more likely to have positive attitude to reporting of cholera outbreak compared to those in the peripheral community. This was not significant (OR 1.10; 95%CI 0.57-2.08)

Respondents who had primary education as their highest educational qualification were about 1.9 times more likely to have positive attitude to reporting of cholera outbreak compared to those with no formal education (the reference educational category). This was not significant (OR 1.97; 95%CI 0.80-4.84). Those with junior secondary school

education were about 1.3 times more likely to have positive attitude to reporting of cholera outbreak compared to those with no formal education. This was not significant (OR 1.33; 95%CI 0.49-3.65). Respondents who had senior secondary school as their highest educational qualification were about 1.2 times more likely to have positive attitude to reporting of cholera outbreak compared to those with no formal education. Respondents with tertiary education as their highest educational qualification were about 2.7 times more likely to have positive attitude to reporting of cholera outbreak compared to those with no formal education. This was also not significant (OR 2.69; 95%CI 0.95-7.65).

TABLE 4.21 Socio-demographic factors influencing attitude to reporting of cholera outbreak among respondents

Variable	Odds ratio	95%CI OR
Age group		
18-30	3.240	1.298-8.086*
31-43	1.893	0.771-4.644
44-56	2.242	0.854-5.889
57+(ref)		
Type of community		
Inner	0.580	0.323-1.043
Transitory	1.084	0.565-2.078
Peripheral(ref)		
Highest level of education		
Primary	1.965	0.798-4.837
Junior secondary	1.330	0.485-3.651
Senior secondary	1.240	0.507-3.034
Tertiary	2.688	0.945-7.649
No formal education (ref)		

*= Significant at 95% CI

4.17 Distribution of respondents who had cholera

Five cases of cholera were studied and all the cases were from the inner-core community. Out of the five cases, there were two males and three females. Ages of the cases were between three years and 56 years old with all the cases reporting stooling and vomiting as the symptoms during the infection.(Table 4.22)

Table 4.22 Characteristics of respondents who had cholera. N=5

Variables	Frequency	Percent %
Sex		
Male	2.0	40.0
Female	3.0	60.0
Type of community		
Inner core	5.0	100.0
Age group		
1-20	2.0	40.0
21-40	2.0	40.0
41-60	1.0	20.0

4.18 Case study of cholera outbreak in Ibadan North West Local Government

The first suspected case, a 56 year old man who took ill on the 27th of August 2011 and reported eating cold amala with ewedu soup. He took well water treated with salt and alum before the onset of the symptoms. Stooling and vomiting started 2 hours after eating. He reported seeing his father first about the symptoms and immediately the first medication given was herbs. The symptoms lasted for about 5 hours after taking the herbs. The patient said "the infection was cholera since there was an outbreak in the community and sensitization was on-going on the symptoms and prevention of cholera. The source of information on the cholera outbreak was heard on the radio. No health worker came to visit him and the case was not reported.

The second case was a confirmed case of cholera, a 23 year old female student who reported taking rice and stew at a nearby restaurant on the 12th of September, 2011 before the onset of the symptoms . Stooling and vomiting started about 4 hours after eating. She reported this to her elder sister who she was staying with. The first medication given was flagyl, tetracycline and septrin but this did not stop the stooling and vomiting. She was taken to the hospital early the next morning by her elder sister where it was confirmed to be cholera. No laboratory test was done but she was placed on intraveneous fluids and admitted for a week. She was of the opinion that "the cholera infection was due to the food she ate at the restaurant because the environment which the food was prepared was not hygienic and she also drank water from the restaurant". The case was not reported as she taught it may lead to people looking down on her family and no investigation was done. There were health campaigns going on during this period on cholera outbreak and was mostly heard on the radio and television.

The third case was a six year old boy who was reported to have died by her mother after been infected by cholera. The boy was reported to have taken amala with ewedu on October 7, 2011 and drank well water before sleeping and in the morning the boy had defeacated on his body followed by vomiting. The mother said "she taught that the boy was having pile and gave the boy an already prepared lime water as the first medication. The stooling and vomiting lasted for the entire day and in the evening the boy was very weak and she took her to the community health centre. At the community health centre, she was told that drugs were not available and was advised to take the boy to a private hospital. At the private hospital, she was told to pay the sum of five thousand naira before any treatment can begin but she could not afford the amount. She later went back home with the child to source for funds but she couldn't get the money. The child died in the middle of the night. She could not explain the reason why the son was infected because they ate the same food and drank the same water, but the case was not reported and no health official came for investigation.

The fourth case was a 23 year old female tailor apprentice, who reported to have taken rice with stew prepared at home with sachet water on the 10th of September, 2011 before the onset of the symptoms. Stooling and vomiting started 3 hours after eating and she reported it to her mother who took her to a private hospital where it was diagnosed to be cholera. She was admitted in the hospital for three days and was placed on intraveneous fluids. She said that "she was infected because there was a cholera outbreak in the community" and awareness was ongoing in the community on cholera outbreak. The main source of information on the outbreak was through the radio. This case was reported to the community head and investigation was carried out by the community health

worker. The investigation carried out by the community health workers involved questions on; the type of food eaten before the infection, water drank before the infection, presence of another case, the source of drinking water, toilet facilities available for the household and proximity of the toilet facilities to the source of water and kitchen were food is prepared. The source of drinking water which was a shallow well in the community was treated by the community health workers.

The fifth case was a 4 year old girl who was staying with her grandmother while her mother was in Lagos State. She was reported to have eaten beans on the 14th of October, 2011 which was bought from a food vendor that morning and in about 4 hours, she started stooling but vomiting started 2 hours later. Her grandmother took her to a private hospital where she was placed on intraveneous fluids and admitted for three days. The grandmother said that "the girl was infected with cholera because the environment which her shop was located was not hygienic as people defecate indiscriminately in the surroundings and she and the little girl spend most of their time at the shop. The only public toilet located in the community is filled up and the proximity of this toilet to the shop was very close". No investigation was done and the case was not reported.

TABLE 4.23 Line Listing of Cholera Cases

CASE	Onet	Signs/ Symptoms	Admitted	Lab Test	Treatment given	Outcome of Treatment	Food eaten Before illness	Prepared at home or outside	Water drank	Source of information	Case reported	Demographic		Reasons why they are infected
												Age	Sex	
1.	27/08/11	SV	N0	N0	Self	Ok	Amala and ewedu	home	Shallow well water	Radio	N0	56	Male	Since there was outbreak in the community
2.	12/09/11	S/V	Yes	N0	Health facility	Ok	Rice and Stew	outside	Shallow well water	Radio and television	N0	23	Female	
3.	7/10/11	S/V	N0	N0	Self	Died	Amala and ewedu	home	Shallow well water	_____	N0	6	Male	_____
4.	10/9/11	S/V	Yes	N0	Health facility	Ok	Rice and stew	home	Sachet water	Radio	Yes	23	Female	There was an outbreak of cholera in the community
5.	14/10/11	S/V	Yes	N0	Health facility	Ok	Beans	outside	Shallow well water	_____	N0	5	Female	The environment she was staying is not hygienic.

S/V= Stooling and Vomitting
Ok= okay

SUMMARY OF FINDINGS FROM CASE STUDY

The summary of the case study conducted in this population is as shown below:

1. Non- reporting/poor reporting of cases because of:
    i. Stigmatization
    ii. Ignorance
    iii. Health workers inefficiency
    iv. Underreporting related to self -treatment
2. Perceive vulnerability identified and it was related to environmental sanitation, food and water contamination and presence of outbreak.
3. Source of information mainly radio.

4.19 SUMMARY OF RESULT

Respondents mean age was 35.0± 11.4 years, 70.7% were females, 69.1% were married and most were Yoruba. Most (95.3%) of the respondents had good knowledge of cholera. About 71.4% knew the cause of cholera and most knew diarrhoea (97.2%) and vomiting (96.3%) as clinical symptoms of cholera. Many (69.8%) ate food prepared outside the house. The commonest source of information during an outbreak was the radio (38.6%). Many respondents (62.3%) perceived their vulnerability to cholera to be low while 98.1% perceived severity of cholera to be high. Significantly, more respondents residing in the inner core communities perceived themselves vulnerable to cholera compared to other communities (OR=23.7: 95%CI 9.64-58.31). Majority (71.2%) of the respondents had positive attitude to reporting of cholera outbreak (OR=3.24: 95%CI 1.30-8.09). Many (82.4%) had never reported a case while 69.3% were willing to report a case. About 70.0% reported they will submit to being investigated during an outbreak.

CHAPTER FIVE

5.0 DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 DISCUSSION

The finding of this study showed that 44.0% of respondents were in ages from 18 to 30 years and 70.7% were women and 69.1% of them were married. Sex did not have any influence on people's knowledge of cholera which disagree with the findings from a cross-sectional survey done in Malawi on "Factors affecting cholera case detection" in 2008,whereby women were more knowledgeable than men as they were the ones who always attend meetings at homes or at the clinics (Chingayipe, E. 2008). On education most respondents had formal education which agrees with the National Demographic Health Survey (NDHS) 2008 data, which indicated that the South Western zone of Nigeria have the highest level of education (NDHS 2008).

The proportion of respondents with good knowledge of cholera was high (95.2%) in this study. This finding is consistent with those found in Malawi in a KAP study in 2002 done in Mangochi, Kasungu and Blantyre which showed that 98% of the people were aware of the signs and symptoms of cholera (Chingayipe, E. 2008). Similarly in a study done in Ilala municipality of Dar es Salaam region in Tanzania, 84.8% of respondents had good knowledge of cholera (Veronica M. and Kagoma S. 2005).

In this study, knowledge of common signs of cholera was high; the two most common signs described were diarrhea (97.2%) and vomiting (96.3%) which were collaborated in case study and also respondents showed high knowledge of transmission modes; 71.4% mentioned it is transmitted through food and water and the prevention method cited was good personal hygiene (95.6%). This result was consistent with the findings in the study in Kenya regarding cholera knowledge were 81.3% identified the main symptoms and majority (70.8%) knew how it was transmitted (Avika, 2009). Furthermore, this result was consistent with the findings from a study in Haiti on cholera prevention were respondents showed high knowledge of transmission mode and knowledge of common signs was high (Valery *e tal*; 2010). Although the level of education did not have a significant relationship with cholera knowledge in this study, the fact that only 7.5% of the respondents had never been to school coupled with the fact that 38.2% had secondary school and 21.1% tertiary education suggest that most of the respondents were educated and this may have influenced their knowledge about cholera. The high level of knowledge may also be due to the high level of awareness due the impact of campaigns on radio and television among community members. Equally is the cholera campaign at the Federal, State, Local Government and wards levels by the Federal Government of Nigeria in the wake of the 2011 cholera outbreak.

Health information is an important concept. Barton and Wamai (1994) observed that inadequate information resulted in lack of service utilization, poor use of opportunities and dependency on peers who may be less informed. In this study, it was established that majority of respondents (60.4%) obtained information through health workers and friends, 28.6% through campaigns and 8.4% through health education trainings. These

results underscore community involvement, multi-sectoral collaboration in provision of health education and other health related services.

Radio and Television ranked highest as the sources of information on cholera during an outbreak, this is consistent with findings from other studies (Valery *e.tal*. 2010). This is important in view of the fact that mass media can reach most people in Nigeria most especially in the suburban community. However, it is apparent that the mass media has succeeded in informing the community when there is an outbreak of cholera but it is probably inefficient to impact sufficient comprehensive information that will aid in controlling the disease. Emphasis should also be laid on reporting of suspected cases as was seen from the case study that many did not report despite being aware of outbreak in the community.

Analysis of knowledge levels compared to hygiene practices showed that practice was reflective of knowledge in this population. This finding was not consistent with published data from Peru (Quick R. *etal*. 1996) which showed that practices concerning cholera lagged behind knowledge and attitude.

Other findings in this study showed that most respondents with good knowledge ate food prepared outside their homes (70.5%) and majority (82.2%) washed their hands with water only before taking their meals. This is also similar to the results of a case-control study of cholera in Kano state, Nigeria which indicated that persons who washed hands with soap before meals were at lower risk of illness from cholera (Hutin, 2003). Hand washing with water alone is not protective against cholera infection which is a common practice in the West African countries. Epidemiological evidence from Guinea (St Louis

*et al.*1990) suggests that hand washing with soap may be associated with a lower risk of cholera during outbreaks. Soap is effective in reducing hand contamination whether or not contaminated or chlorinated water is used for hand washing. Previous studies in other societies have shown that washing hands with soap can decrease the risk of diarrheal disease by 47% (95%CI: 24-63%), and the promotion of hand washing with soap before taking meals in homes in developing countries should become a public health intervention of choice (Curtis and Cairncross, 2003). Educational campaigns should emphasize hand washing with soap before taking meals as a primary prevention against cholera in an outbreak setting.

In the study population, perceived vulnerability to cholera was low. More than half (55%) of the respondents believed that the current environment they lived in do not make them prone to cholera infection. More than 60% of the respondents did not believed that they can be infected with cholera in the nearest future. There was a significant relationship between perceived vulnerability of cholera and community. Respondents in the inner core community were more likely to perceive themselves vulnerable to cholera outbreak compared to other communities. During 2011 cholera outbreak which happened in the study population, the inner core community had the highest number of cases compared to other communities. This was not expected going by one of the key constructs of the Health Belief Model on perceived susceptibility which says that people's beliefs about whether or not they were susceptible to disease and their perceptions of the benefits of trying to avoid it will influenced their readiness to act. This suggests that although many were knowledgeable about cholera, they perceive lower risks for themselves and their

family members. It is possible that low perceived risk may lead to complacency regarding cholera prevention.

According to most models of health behavior, perception of being at risk is a prerequisite for behavior change, a supposition supported by empirical studies (Brewer *e.tal*. 2004). There models endorse the belief that a high perceived risk of harm encourages persons to take action to reduce the risk. One of the major factors causing the spread of cholera in Africa community is the failure to accept the gross reality of the disease; the acceptance of prevention messages depend largely on the degree to which the target population actually feel that cholera is a real threat to them. This low perception of self vulnerability to cholera outbreak is significant as it may likely influence the attitude of respondents towards the uptake of preventive measures.

Another important finding in this study was the high proportion of those who perceived cholera outbreak to be severe in the study population. Most (92.3%) of the respondents believed that cholera infection kills rapidly, 91.8% believed that cholera infection is a serious disease that can endanger life within hours while few (8.0%) of the respondents believed that people easily recover from cholera without treatment. The high level of perceived seriousness to cholera outbreak in this population may be based on the fact that cholera is indeed more prevalent in this population and may indicate that people are more familiar with the disease. The use of mass media and jingles during cholera outbreak may have given information on the severity of cholera infection and the fact that some of the cases died could also have informed the perception that cholera outbreak is a serious phenomenon.

The assessment of the attitude of the participants showed a positive attitude towards reporting of cholera outbreak. This attitude could be explained by good knowledge about cholera. The disagreement by a large majority that reporting of cholera outbreak can bring stigma to a community and household which was however refuted in all of the case studies is not consistent with study from Cogan *et al* in 1998 which said that infectious disease is one the most common conditions associated with stigma. Infectious diseases are more likely to be stigmatized under four unique circumstances: First, when the cause of the disease is considered to be the fault of the infected individual; second, when the disease is considered to be terminal and degenerative; third, when the disease is considered to be contagious and detrimental to others; and finally, when the disease is physically apparent (Joan, *e tal*., 2011).

Knowledge of a disease determines its recognition and reporting (Ameji *e tal*., 2012) hence this is a major reason why respondents had positive attitude to reporting of outbreak. This study also showed that age had a significant effect on attitude as respondents between the age group of 18-30 years were more likely to have positive attitude to reporting. This may be so because respondents within this age group are more of students which will affect knowledge and subsequently affect attitude.

Most respondents (69.3%) were willing to report cases. This is a good indicator for control; it also implies that control activities will be effective in the event of an outbreak within the community since community members can report immediately the occurrence of the disease.

5.2 CONCLUSION

Knowledge of cholera was high in this study population. Respondents showed high level of knowledge on common signs and transmission modes of cholera infection. This high level of knowledge may be due to high level of awareness created by the impact of mass media, campaigns and jingles by the Federal, State, Local Government and wards in the wake of the 2011 cholera outbreak and the fact that many attended schools. Hygiene practices was reflective of cholera knowledge, although most respondents with good knowledge of cholera eat food prepared away from homes and washed hands with water only before taken meals.

The radio and the television were ranked as the highest source of information during a cholera outbreak. It was clear that the mass media succeeded in informing the community during the outbreak but it is inefficient to impact comprehensive information that will aid in reporting and controlling the disease.

Perceived vulnerability was low while perception of seriousness of cholera outbreak being high in the study population. Respondents living in the inner core community were more likely to perceive themselves vulnerable to cholera outbreak compared to other communities. The low perceive vulnerability to cholera outbreak in this community may lead to laxity regarding cholera prevention and may lead to failure to accept the gross reality of the disease which will influence the attitude of the respondents towards the uptake of preventive measures.

Respondents demonstrate positive attitude towards reporting of cholera outbreak, however the practice was poor as shown in the case studies. The positive attitude towards

reporting could be due to the good knowledge of cholera in the population. Age of respondents have significant effect on attitude as respondents within the age group of 18-30 years were more likely to have positive attitude to reporting. Most respondents who had high perceived vulnerability to cholera outbreak reported that they will be friendly to investigators and interested in outbreak investigation.

5.3 RECOMMENDATIONS

Based on the findings from this study the following recommendations are made;

1. It is evident from this study that hygiene practice is reflective of knowledge in Ibadan North-West LGA. A number of risky socio-cultural practices associated with cholera have been found. The study suggests specific socio-cultural practices such as treatment of water with alum and washing of hands with soap and water should receive priority attention.
2. There is need for health workers to intensify IEC in the community before, during and after outbreak. There is a need to correct misconception concerning cholera such as cholera cannot be transmitted through shaking hands with infected person and cholera can be transmitted through insect bite. The fact that perceived severity is high offers a good point for more specific risks communication to promote precautionary actions, such communication should aim at improving hygiene practices and focus on perceived vulnerability.
3. The study documented a high positive attitude towards reporting of cholera outbreak. This offers a window of opportunity in the control of cholera in the population. This should be supported by major stakeholders in the health industry through the

provisions of pipe-borne water, treatment of community water source, construction of toilets facilities in the community, provision of good waste disposal system and provision of water guards for household treatment of water.

4. There is need for media – driven health educational programmes in this population. Cholera outbreak is linked with a person's personal hygiene and attitude, there is need to follow the awareness created by the media during outbreak with a more detailed person to person health educational approach.

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APPENDIX 1 QUESTIONNAIRE 1

KNOWLEDGE, PERCEPTION AND ATTITUDE TO CHOLERA OUTBREAK AMONG RESIDENTS IN IBADAN NORTH-WEST LOCAL GOVERNMENT AREA, NIGERIA

Good day.This Questionnaire is part of a new project that will help to provide information on the community perception of cholera outbreak and attitude to reporting and Investigation. The questionnaire has several components andquestions about what people know, believe and information about cholera outbreak will be asked. The interview will last approximately 15 minutes, your answers will help to improve public health services. This interview is anonymous and confidential and will be used only for research purposes, so please be as truthful as possible. Completion of this questionnaire is voluntary and you have a right to decline to participate. Thank you for your assistance.

Would you like to participate in the survey? YES NO

Serial No:……

SECTION 1: SOCIO-DEMOGRAPHICS

1. Sex of the respondent. 1. Male { } 2. Female { }
2. For how long have been staying in this community? ……Years
   Note : if less than 1 year **STOP**
3. How old were you at your birthday? …….
4. Residence ……
5. Ward ……
6. What is your highest level of education?
   1. Primary { } 2. Junior secondary { } 3. Senior secondary { } 4. Tertiary { } 5. No formal education { }
7. What type of work do you do ?
   1. Professional { } 2. Junior Civil servant { } 3. Senior Civil servant { } 4. Artisan { } 5. Unemployed { } 6. Retired { } 7. Trading { } 8. Other, specify ……..
8. What is your marital status?
   1. Single { } 2. Married { } 3. Seperated { } 4. Divorced { } 5. Widowed { }
9. What is your religion?
   1. None { } 2. Christianity { } 3. Islam { } 4. Traditional { }
   2.
10. What is your Tribe? 1. Igbo { } 2. Yoruba { } 3. Hausa { } 4. Other, specify ……

11. Have you ever heard of cholera?

    1. Yes { } 2. No { }

    NOTE: IF NO STOP

SECTION 2: CHOLERA KNOWLEDGE

12. What do you understand as cholera?

……
……
……
……..

13. For the following statement on cholera, respond by ticking the option that fits your opinion.

S/N	QUESTIONS	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
1	Cholera is mostly found in developing countries(countries that have not achieved significant industrialization and have low standard of living)					
2	People living in an unhygienic environment are more at risk of having cholera					
3	Cholera is highly preventable					
4	Cholera can be passed from one person to another					
5	You can get infected with cholera, if you eat or drink contaminated food and water					
6	Constant washing of hands with soap and clean water can prevent cholera infection					
7	Good personal hygiene is a primary method of preventing cholera					
8	You can get infected with cholera by shaking hands with an infected person					
9	Defecating indiscriminately can lead to cholera					
10	You can be infected with cholera, if you share toilets with an infected person					
11	Cholera is not transmitted through insect bite					
12	Vomiting is a symptom of cholera					
13	Technique available for detecting cholera is through stool test					
14	Watery stool is a symptom					

	of cholera					
15	Cholera infection kills					
16	Cholera infection can be treated					
17	The causative agent of cholera is transmitted through food and water.					
18	Eating cold and left over food is a risk factor of cholera.					
19	Eating outside from home is a risk factor of cholera.					

14. Which of these options was/is your source of information on cholera?

		Yes	No
1	Through a friend		
2	Through campaigns		
3	Media/Posters		
4	Health worker		
5	Taught in school		
6	Learnt in the health facility, during the period of exposure		
7	Other, specify……		

SECTION 3: HYGIENE PRACTICES REGARDING CHOLERA

15. Do you eat outside or you only eat food prepared in your home?

1. Yes, I eat out { } 2. No, I don't eat out { }

16. Do you eat cold leftover food from the previous day?

1. Yes { } 2. No{ }

17. Where do you get your drinking water?

1. Borehole { } 2. Shallow wells { } 3. Buy Sachet water { } 4. Rain water { } 5. Others specify……..

18. Do you treat your water before drinking?

1. Yes { } 2. No { }

19. How do you treat your drinking water?

1. Alum { } 2. Boiling { } 3. Sieving { } 4. Water guard { } 5.Table salt 6. Other specify……

20. Do you have a toilet in your house?
1. Yes { } 2. No { }

21. What type of toilet do you have?
1. Modern toilet { } 2. Pit latrine { } 3. Chamber pot { } 4. Bush/open dump { } 5. Other specify……

22. How often do you wash your hands after leaving the toilet?
1. All the time { } 2. Not all the time { } 3. I don't wash my hands { }

23. What do you wash your hands with after leaving the toilet?
1. Water { } 2. Water and soap { } 3. Ash and water { } 4. Others specify…….

24. How often do you wash your hands before taking meal?
1. All the time { } Not all the time { } 3. I don't wash my hands { }

25. What do you wash your hands with before taking any meal?
1. Water { } 2. Water and soap { } Ash and water { } 4. Others specify…….

26. How often do you wash your fruits before eating?
1. All the time { } 2. Not all the time { } 3. I don't wash fruit { }

SECTION 4: SOURCE OF INFORMATION DURING A CHOLERA OUTBREAK

I will ask some questions about the cholera outbreak that happened in your Local Government recently (Last year).

27. What was your first source of information on the cholera outbreak?

……
……

28. What was your main source of information on the cholera outbreak?
1. Television { } 2. Radio { } 3. Newspaper { } 4. Friends { } 5. Health workers { }
6. Neighbors { } 7. Others specify…….

29. Imagine an outbreak of cholera in your community. What would you find most important to know in that situation?
1. How the disease is transmitted { } 2. How to recognize the symptoms of the disease { }
3. What to do to prevent it from affecting me and my household { } 4. The chance of getting infected { } 5. How the disease is treated { } 6. Where to report cases { } 7. Others specify……

SECTION 5: PERCEIVED VULNERABILITY TO CHOLERA OUTBREAK

For the following statements, respond by ticking the option that fits your opinion most.

S/N	**Questions**	**Strongly disagree**	**Disagree**	**Don't know**	**Agree**	**Strongly Agree**
30.	The current state of the environment I live in makes my community prone to					

	cholera outbreak					
31.	I think that there is a high likelihood of my family been infected in the nearest future.					
32.	I think that there is a high likelihood of been infected by cholera in the nearest future.					

PERCEIVED SEVERITY OF CHOLERA

S/N	**Questions**	**Strongly disagree**	**Disagree**	**Don't know**	**Agree**	**Strongly Agree**
33	Cholera infection kills rapidly					
34	Cholera infection is a serious disease that could endanger life within hours					
35	A person infected with cholera can infect many other people within hours					
36	People easily recover from cholera without treatment					
37	Cholera is not a serious disease					

SECTION 6: CASE STUDY OF CHOLERA

38. There was a cholera outbreak in your LGA last year, was there a case in your compound?

1. Yes { } 2. No { }

Note: If No go to the next section but if yes, identify the case and carry out a case study. Use the case study guide attached to this questionnaire to carry out a case study on the cases identified.

SECTION 7: ATTITUDE TO REPORTING AND INVESTIGATION

39. Have you ever reported a cholera case to the Government or to anyone?

1. Yes { } 2. No { } 3. Can't Remember { }

40. If yes, where did you report the case?

1. Community leaders { } 2. Health Facility { } 3. Media House{ } 4. Community Health workers/Health Officers { } 5. Others specify……

Please tell me whether you agree with the following statement

S/N	**Questions**	**Strongly disagree**	**Disagree**	**Don't know**	**Agree**	**Strongly Agree**
41	Reporting is not necessary during a cholera outbreak					
42	Reporting of cholera outbreak can lead to reprimanding the people/family.					
43	Reporting of cholera outbreak can lead to reprimanding the community					
44	Reporting of cholera outbreak can bring					

	stigma to the household.					
45	Reporting of cholera outbreak can bring stigma to the community					
46	Reporting of cholera outbreak is a waste of time and money					
47	A person who goes to report has put his/her community to shame					
48	Prompt reporting of a case to the authority during an outbreak will reduce the spread of cholera					

49. Will you be willing to report a case, in case of a cholera outbreak in your community?
1. Yes { } 2. No { } 3. Don't Know{ }

50. Will you be willing to collect the result of the test from the stool sample taken?
1. Yes { } 2. No { }

51. What will be your attitude to investigation during a cholera outbreak?
1. Friendly and interested { } 2. Cooperative but not particularly interested { } 3. Impatient { } 4. Hostile{ } 5. Other specify……

APPENDIX 2

YORUBA QUESTIONNAIRE

Oruko mi ni Dickson Emmanuel, mo je omo ile-iwe eko giga varsity Ibadan. Ibeere yi je ara awon ise iwadi lati se iranlowo ti yio pese iroyin lori ero okan awon eniyan lori ajakale arun onigbameji ati iwuwasi-won lori fifitonileti ati ise iwadi. Mo le beere ibeere ti o le nira lati dahun. Sugbon se akiyesi nitoripe idahun yin je monsinu-monsikun. A fun yin ni numba, a o si ni gba oruko yin sile nitoripe ao fe ki enikeni mo ipe iwo lo dahun ibeere wonyi. Ibeere yi ni awe opolopo, maa beere ohun ti e mo, igbagbo ati iroyin lori ajakale arun onigbameji. Asiko ibeere yi ko ni gba yin ju iseju meedogun lo, idahun re yio ran wa lowo lati se afikun ilosiwaju eto ilera gbogbogboo. Ibeere yii wofun ni ilelorun, o ni eto lati jawo ni ibe ni igbakugba. Esee fun riran walowo.

Nje o ma fe lati kopa ninu ise iwadi yii bii? BEENI BEEKO

Ipin kinni: Sosio demografik

1. 1. Okunrin ( ) 2. Obinrin ( )
2. O ti to odun melo ti o ti n gbe agbegbe yi? ……
   Akiyesi : Ti koba to odun kan dawo ibeere duro
3. Omo odun melo ni o ni ojo ibi re to koja.?.....
4. Agbegbe ti e ngbe ……..
5. Wardi …….
6. Ipele wo ni e de ninu iwe kika?
   1. Alakobere, payamori { }
   2. Onipele eji eere, junio sekondiri { }
   3. Onipele keji giga senio sekondiri { }
   4. Ile eko giga { }

   5. Akeko gboye { }
   6. Miomooko mooka { }

7. Iru ise wo ni o n se?

1. Akosemose { }
2. Osise ijoba onipokekere { }
3. Osise ijoba onipo giga { }
4. Kolakosagbe { }
5. Alaniselowo { }
6. Osisefehinti { }
7. Onisowo { }
8. Iru ise yi o wu koo.....

8. Nje o ti loko tabi laya?
    1. Apon ni mi { }
    2. Mo wa ni ile oko/emi ati iyawo mi gbe po { }
    3. Emi ati oko mi ti yapa{ }
    4. Emi ati oko mi ko gbe papo/emi ati iyawo mi ko gbe papo{ }
    5. Opo ni mi { }
9. Iru esin wo ni o n sin?
    1. N ko lesin { }
    2. Igbagbo { }
    3. Musulumi { }
    4. Esin ibile { }
    5. Iru esin yio wu ko je ko.....
10. Iru eya wo ni o je
    1. Igbo { }
    2. Yoruba { }
    3. Hausa { }
    4. Iru eya miran ti o ba je ko.....

11. Nje o ti gbo nipa arun onigbameji ri?
    1. Beeni { } 2. Beeko { }

Ti o ba je beeko dawoduro

IPIN KEJI: IMO NIPA AJAKALE ARUN ONIGBAMEJI

12. Kini arun onigbameji je ?

……

……

……

13.Jowo so fun mi boya o faramo tabi o ko faramo awon gbolohun wonyi lori onigbameji

S/N	Ibeere	Mofaramo Daadaa	Mofaramo	Nko Mo	Nko Faramo	Nko Faramo rara
1	Arun onigbameji je ohun ti o wopo laarin awon orile ede ti won sese ngoke agba					
2	Awon eniyan ti won ngbe agbegbe ti ko ni imototo to lee ni arun onigbameji					
3	A lee dekun arun onigbameji					
4	Arun onigbameji lee tan lati odo enikan de odo elomii					
5	A lee ko arun onigbameji nipa jije ounje tabi mimu omo ti idoti ti ko si inu re					
6	Fifowo loorekoore pelu omi tomo ati ose lee din arun onigbameji kuu					
7	Itoju ara ni je ona kan gbogi ti a lee fi dena arun onigbameji					
8	A lee ko arun onigbameji nipa bibowo pelu eni to ba ni arun naa					
9	Yiya igbe kaakiri lee fa arun onigbameji					
10	A lee ko arun onigbameji nipa lilo ile igbonse pelu eni ti o ba ni arun naa					
11	A lee ko arun onigbameji nipa ki kokoro je ni					
12	Eebi je apeere arun onigbameji					
13	Ayewo igbe je ona kan ti afile mo bi eniyan ba ni arun onigbameji					
14	Igbe gbuuru je apeere arun onigbameji					
15	Arun onigbameji le seku pani					
16	Arun onigbameji see toju					

17	Kokoro ti o se okunfa arun onigbameji le ran lati odo enikan si odo enikeji lati inu ounje ati omi					
18	Jije ounje ti o tutu ati ounje ajeku lee se okunfa arun onigbameji					
19	Jije ounje nita le se okunfa arun onigbameji					

14. Bawo ni ese gbo nipa arun onigbameji yi?

		Beeni	Beeko
1	Lat o do ore		
2	Nipase ipolongo lori eto ilera		
3	Ile igbohun safefe/iwe ti a lemo ogiri		
4	Lati odo awon osise eleto ilera		
5	Won ko mi ni ile-iwe		
6	Gbo ni ile iwosan nigba ajakale arun onigbameji ti o koja		
7	Omiran, so nipato……		

IPIN KETA: NKAN TI O NSE OKUNFA AJAKALE ARUN ONIGBAMEJI

15. Nje e man jeun nita ?

1. Beeni, mo ma nje nita { } 2. Beeko, mi kin je ounje ita { }

16. Nje o ma je ounje ajeku ti o tutu?

1. Beeni { } 2. Beeko { }

17. Nibo ni e ti man pon omi mimu?

1. Kangadero { } 2. Kanga { } 3. Mo nra omi inu ora (pure water) { } 4. Omi ojo { } 5. Ona miran jowo so ……..

18. Nje e maa n se ajoo omi yin ki e to mu?

1. Beeni { } 2. Beeko { }

19. Ti o ba je Beeni, iru ajoo wo ni e ma n se si omi yin?

1. Fifi halomu si omi { } 2. Sise omi titi o ma fi oho { } 3. Sise omi { } 4. Lilo ogun bi water guard { } 5. Ona miran …….

20. Nje e ni ile igbonse nile yin?

1. Beeni { } 2. Beeko { }

21. Iru ile igbonse wo ni e ni ?

1. Ile igbone alawo { } 2. Salanga { } 3. Poo { } 4. Inu igbo tabi ori tan { }5. Iru ile igbonse miran so …….

22. Se gbogbo igba ni e n man fo owo ti e ba ya igbe tan?

1. Gbogbo igba { } 2. Ki nse gbogbo igba { } 3. Mi ki fowo mi { }

23. Kini o fi man fo owo ti o bay a igbe tan?

1. Omi nikan { } 2. Omi ati ose { } 3. Eeru ati omi { } 4. Ona miran soo…….

24. Bawo ni e se ma n saba fowo ki e to jeun ?

1. Gbogbo igba ni mo fowo { } 2. Kii se gbogbo igba ni mo fowo { } 3. Mi ki fo owo rara { }

25. Kini ohun ti e maa fin fowo ki e to jeun ?

1. Omi nikan { } 2. Omi ati ose { } 3. Eeru ati omi { } 4. Ona miran……

26. Bawo ni e se ma n saba fo eeso yin ki e too jee?

1. Gbogbo igba ni mo fo eeso { } 2. Kii se igbogbo igba ni mo fo eeso { } 3. Mi kii fo eeso rara { }

IPIN KERIN: ONA TI O N GBA GBO NIPA AJAKALE ARUN ONIGBAMEJI

Maa beere ibeere lori ajakale arun onigbameji ti o sele ni ijoba ibile re ni odun to koja

27. Ibo ni ibi akoko ti e ti gbo iroyin nipa itankale arun onigbameji yi?

……
……

28. Ewo ni o je ona Pataki julo ti e ti gbo?

1. Amohunmaworan { } 2. Asoromagbesi { } 3. Iwe Iroyin { } 4. Ore { } 5. Enu awon onise ilera { } 6. Alajogbe { }7. Ona miran so……

29. kin ni o ro pe o je okan pataki lati mon ni asiko ti ajakale arun onigbameji ba sele?

1. Ona ti arun naa gba tan kale { } 2. Bi a se le da iru eni ti aisan naa bamu mo { }

3. Ohun ti mo le se ti ko fi ni mumi ati awon alajogbele mi { }

4. Bi a see le toju aisan yii { } 5. Ibi ti o ti le se ifitonileti { } 6. Ona miran so……

IPIN KARUN: Ma bere awon ibeere nisinsinyi, wa so ohun ti o gbagbo nipa won fun mi. 1. Nko faramo rara 2. Nko faramo 3. boya mo faramo tabi mi o faramo 4. mofaramon 5. Mofaramon daadaa

S/N	Ibeere	nko faramo rara	nko faramo	Nko mo	Mofaramo	Mofaramo daadaa
30	Bi ayika agbegbe ti					

	mo gbe lowo yi se wa, le se okunfa arun onigbameji					
31	O se se fun awon ebi mi lati ko arun onigbameji ni ojo iwaju					
32	O se se ki ko arun onigbameji ni ojo iwaju					

S/N	Ibeere	nko faramo rara	nko faramo	Nko mo	Mofaramo	Mofaramo daadaa
33	Arun onigbameji n pani ni kiakia					
34	Arun onigbameji je arun kan ti o lagbara ti o si le se ijamba fun ilera eniyan laarin wakati die					
35	Eni to ba ti ni arun onigbameji lee ko ran awon elomiran laarin wakati die					
36	Ara awon eniyan tete ma y alai gba itoju fun arun onigbameji					
37	Arun onigbameji ki se arun ti o lagbara					

IPIN KEFA: ISE IWADI LORI ARUN ONIGBAMEJI

38. Ajakale arun onigbameji sele ni ijoba ibile re ni odun ti o koja, nje o ja de inu agbo ile re?

1. Beeni { } 2. Beeko { }

AKIYESI: Bi o ba je Beeni, se idaamo re ki o si se ise iwadi lori re, ti o ba je Beeko dawoduro ki o si losi ipin ti o tele.

IPIN KEJE: **Iwuwasi loro fifi ajakale arun onigbameji to awon ijoba leti ati igbese lori ise iwadi.**

39. Nje a ri igba Kankan ti e fi ibesile ajakale arun onigbameji to awon ijoba tabi elomiran leti ri ?

1. Beeni { } 2. Beeko { } 3. Nko ranti { }

40. To ba je beeni , ibo loti se ifitonileti?

1. Odo olori Agbegbe { } 2. Ile iwosan { } 3. Ile igbohunsafefe { } 4. Lodo awon onise ilera ti o wa ni ilu { } 5. Omiran so ……

Jowo so fun mi boya o faramo tabi o ko faramo awon gbolohun wonyi

S/N	Ibeere	nko faramo rara	nko faramo	Boya mi o faramo tabi nko faramo	Mofaramo	Mofaramo daadaa
41	Ifitonileti ko se Pataki nigbati ajakale arun onigbameji ba be sile					
42	Ifitonileti ajakale arun onigbameji, le mu ki won da eniti arun ba mu ati ebi re lebi					
43	Ifitonileti ajakale arun onigbameji, le mu ki won da awon eniyan ti o wa ni agbegbe ti ajakale arun na ti sele lebi					
44	Ifitonileti ajakale arun onigbameji le mu ki won da ile ti arun na ti sele yasoto					

45	Ifitonileti ajakale arun onigbameji le mu ki won ya adugbo yin si oto					
46	Ifitonileti ajakale arun onigbameji je ifakoko ati owo sofo					
47	Eniti o lo se ifitonileti ajakale arun onigbameji ti fi abuku kan adugbo ati agbegbe re					
48	Fifi ajakale arun onigbameji to awon alase leti ni kiakia le deena itankale re					

49. Nje wa fe fi to awon ijoba leti ti ajakale arun onigbameji ba besile ni agbegbe re?
    1. Beeni { } 2. Beeko { } 3. Nko mo { }

50. Nje wa nife lati gba eesi ayewo igbonsi yi bii?
    1. Beeni { } 2. Beeko { }

51. kini yio je iwuwasi re si asiko iwadi, ni gba itankale arun onigbameji?
    1. Ma nife si
    2. Ma fi owosowopo sugbon nko fi bee ni ife si
    3. Mi o ni asiko fun eto iwadi
    4. Ma binu si awon ti won se iwadi na
    5. awon iwuwasi miran ko.....

APPENDIX 3

CASE STUDY GUIDE

I learnt that in the last year you were infected by cholera however I thank God that you are well and hearty now. I will like you to tell me how it happened.

1. SEX…… A. Male{ } B. Female { }
2. Age……..
3. Occupation of the case……
4. Description of the illness which will include the following:
   A. When did you become infected?.....
   .....
   .....
   .....
   B. Clinical description of the illness…….....
   .
   ……
   ……
   ……
   ……

   C. Who took decision on what to do?.....
   D. Where you admitted? Yes { } No { }
   D. Was a test performed? Yes { } No{ }
   E. Was any treatment given? Yes { } No{ } . If Yes what kind of treatment was given……
   ……
   F. What was the outcome of the treatment?……
   ……
   ……
   ……
   ……..
   G. What were the problems encountered during this illness?.....
   .....
   .....
   .....
   .....
5. Why do you think you became infected?
   a. What did you eat last before the cholera infection?.....

b. Did you eat it hot or cold? Cold{ } Hot{ }
c. Did you eat outside or was it prepared at home? Yes I ate out{ } No{ }
d. Was the food from the previous day? Yes { } No{ }
e. What did you drink last before the cholera infection?.....
Probe the kind of drinking water……

6. Was your case reported? Yes { } No{ }
7. Where was it reported?.....

APPENDIX 4

ETHICAL APPROVAL

TELEGRAMS..... TELEPHONE.....

MINISTRY OF HEALTH

DEPARTMENT OF PLANNING, RESEARCH & STATISTICS DIVISION

PRIVATE MAIL BAG NO. 5027, OYO STATE OF NIGERIA

Your Ref. No. .....
All communications should be addressed to the Honourable Commissioner quoting
Our Ref. No. AD 13/ 479/ 217

4th June, 2012

The Principal Investigator,
Department of Epidemiology,
Medical Statistic & Environmental Health,
College of Medicine,
University of Ibadan,
Ibadan.

Attention: Dickson Emmanuel Akpan

Ethical Approval for the Implementation of your Research Proposal in Oyo State

This acknowledges the receipt of the corrected version of your Research Proposal titled: *"Community Perception of Cholera Outbreak and Attitude to Reporting and Investigating in Ibadan North-West Local Government."*

2. The committee has noted your compliance with all the ethical concerns raised in the initial review of the proposal. In the light of this, I am pleased to convey, to you, the approval of committee for the implementation of the Research Proposal in Oyo State, Nigeria.

3. Please note that the committee will monitor, closely, and follow up the implementation of the research study. However, the Ministry of Health would like to have a copy of the results and conclusions of the findings as this will help in policy making in the health sector.

4. Wishing you all the best,

OYO STATE RESEARCH ETHICAL REVIEW COMM. MINISTRY OF HEALTH, IBADAN

Mrs. V. A. Adepoju
Director, Planning, Research & Statistics
Secretary, Oyo State, Research Ethical Review Committee