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Research Paper

Responses Evaluation By Victimsof Typhoid Fever On Taking Anti – Typhoiddrugs In Selectedhealth Institutions In Anyigba, Kogi State, NIGERIA: a biogeographical approach!

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ABSTRACT
Globally the incidence of typhoid and typhoid related illnesses are known to be responsible for a number of health problems in many regions of the world. Typhoid is transmitted by the ingestion of a substance such as food or water that has been contaminated with the feces of a person infected by the bacterium called Salmonella typhi, serotype Typhi. Due to its health implication,the spread of typhoid disease and the rate of infection has been a matter of worry across tropical nations of the world, particularly in Nigeria.In this work therefore, studies were carried out with a view todetermine the disposition of samples of the population of the people of Anyigba, a rapidly urbanizing community in Kogi state, Nigeria, to the disease that haven taken anti-biotic injections. Data were generated within the period of two years betweenthe month of April 2016 and May 2018, but sourced from both empirical and theoretical backgrounds, covering three categories of people: children, adults and the old people. 124 patients, from three randomly selected health institutions in Kogi East were sampled to acquire the desired health and biographic data for analysis, basically coveringthe two brands of antibiotics. The three health institutions were selectively drawn from the three geopolitical areas of Anyigba that constitute the largest or most comprehensive/government approved health institutions in the area. These are the Comprehensive Health Center, Anyigba (24 respondents), the Grimard hospital, Anyigba (50 respondents) and the Diagnostic Hospital, Anyigba (50 respondents). These samples were analyzed with simple proportion, while the mean values were taken to determine their mean proportions and cumulative scores. The result of the study revealed that there is no significant difference between the two brands of anti-typhoid drugs at 95% confidence level, since the critical D of 0.12 is greater than the calculated D of 0.10.Based on the already established statistical principle, the hypothetical statement was thus accepted, meaning thatthe new anti-typhoid drugs conformed to its expectation.It was thus concluded that the application of anti-biotic drugs on typhoid patients responded positively and could be considered a permanent cure measure in order to reduce losses in population and increase productivity at work. It was thus concluded that the positive response demonstrated goes a long way to suggest a more permanent measure in tackling the deadly disease, especially in the phase of rapidly growing population in the study area. It was therefore recommended thatthe continuous prevention of the disease through proper hygiene, education and the chlorination of drinking water would lead to dramatic decrease in the transmission of typhoid fever in the study area.

KEY WORDS: *Disease, Bacteria, Effects, Medication, Spatial Spread.*

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I. INTRODUCTION

Typhoid fever, loosely known as typhoid, is a common, worldwide bacterial disease. It is one of the major killer diseases across the globe. In the tropical regions of the world, historical evidence shows that the effects of the disease grow correspondingly with the changing phenomenon of climate. The global estimate of typhoid fever caused by the parasite *Salmonella enteric serovar Typhi (S. Typhi)*stood at 26.9 million cases with 217,000 recorded deaths, (Akinyemi, 2018). This estimate, according to the author was adjusted for blood culture sensitivity based on conservative assumption of 50%, maintaining that only Egypt and South Africa

were major contributors. Previously, the author remarked that global estimate of the burden of typhoid fever indicated that south central and east central Asia had the highest incidences of typhoid fever with more than 100 cases per 100,000 people annually. Estimates shows that Africa had a medium incidence of about 10 to 100 cases, while the estimated number in low and middle income countries in 2010 after adjusting for water related risk was 11.9 million (95% confidence interval: 9.9 – 14.7) cases with 208,000) deaths.It was further explained that typhoid fever in Nigeria remains a major disease because of factors such as increased urbanization, inadequate supply of portable water, regional movement of large numbers of immigrant workers, inadequate facilities of processing human wastes, overburdened health-care delivery systems, and overuse of antibiotics that contribute to the development and spread of antibiotic resistant S Typhi. It was however said that the true cases of the disease could not easily be explained in Nigeria due to the absence or inadequate epidemiological surveillance programmes. Nevertheless, the author informed that data on the disease prevalence has been documented by several researchers in some states in Nigeria and ranges from 0.071% in Oyo to 47.1% in Osun state.

Typhoid fever is a tropical disease that is prevalent in the tropical regions of the world. Studies have shown that Geography, particularly medical Geography as a field of study stand to offer the best explanations on the behavior, nature and spread of the disease across geographical space. The bacteria which cause typhoid fever may be spread through poor hygiene habits and public sanitation conditions and, sometimes, also by flying insects feeding on infected feces. The main symptoms of typhoid fever are: high temperature that can reach 39 to 40^0 Celsius, headache, general aches and pains, rash, cough and constipation. Similarly, the outbreak and spread of diseases such as malaria, Encephalitis, Blue tongue, right valley fever, African horse sickness, murry valley disease, Rose river virus, in various parts of the world have all been associated with variation of climate. As the infection increases, victims normally lose appetite, feel sick, and have a tummy ache and at times diarrhea. The critical nature of the disease and the rate at which it has affected many parts of the tropical world has attracted the attention of Biogeographers who consider that bioclimatological tools could best be adopted to analyze the dilemma of typhoid. Typhoid disease is rare in industrialized countries, because of their level of civilization, (Sawa, 2010). It was also revealed that the disease is uncommon in the United Kingdom 'UK', with an estimated 500 cases occurring each year. Nevertheless, the disease remains a serious health threat in the developing world, (Googleweblight.com, 2017). It is generally believed that typhoid is common in regions of the world that have poor sanitation, with limited access to clean water. In places such as Bangladesh, India, Pakistan, Asia, South America and Africa for example, typhoid is prevalent. According to Googlelight, worldwide, children are thought to be most at risk of the dreaded disease; hence their immune system is at infancy. It was however revealed that children with typhoid fever tend to have milder symptoms than adults. There is no doubt believing the fact that the disease is a common threat to many lives across the globe and it is neither a respecter of sex, age, race nor social status.

Statement of the Research Problem

Recent studies in Nigeria generally have revealed the outbreak and prevalence of typhoid disease, which commonly occur during the hot dry season. Yet, the extent to which the outbreak of this water/food borne disease spread and influenced by rising temperatures in the study area has not yet been adequately investigated and documented. Despite the realization of the influence of the disease on the health and psychological states on the population as well as the poverty level of the people, very little attention has been directed towards ameliorating the disease in its entirety in the study area. Similarly, very little attention has been directed at studying the actual health implications of the disease in the study area. This is attenuated by low technological breakthrough in health management practices in the area. According to Majebi and Abass, (2010), the public health sector in Nigeria has not fully embraced the GIS technology and research on how it can be applied, exceptionally in few health centers, usually located in the urban areas or large cities. They confirmed that the Federal Ministry of Health had just started focusing attention on the use of GIS/RS to capture health service infrastructures where more of the analytical research in terms of accessibility to health services has to be conducted by the Medical Research Council. The authors maintained that typhoid incidences are worse in the rural areas where access to health facilities are less optimized. The relevance of GIS technology in data acquisition and mapping of human diseases such as typhoid and related diseases in the study area is inadequate to support the current researchers. Despite the realization of the influence of climate, being the major determining factor of disease spread on the physiological processes in the human body and outbreak of the diseases, very little attention has been directed at studying the actual health implications of climate in the study area. The people's knowledge about favorable climate is sacrosanct to determine the health status of affected individuals. For proper physiological functioning of the human body, the body must respond to changes in the condition of the environment brought about by alterations in the environment components.

The influence of climate also increases the effects of typhoid disease. The variability in weather and climate has been shown to have an impact on infectious disease outbreak and spread, (Sawa, 2010). Increases in

cases of typhoid are often associated with warmer temperatures and humid conditions. The author remarked that while many tropical diseases are associated with variability of climate, the seasonal nature of outbreaks of several human and animal diseases shows that climate plays an important role in their occurrences. It shows that climate anomalies have demonstrated significant increases in disease transmission. It was explained furtherthat climate in its self influences the incidences of diseases in two major ways: firstly, it affects the resistance of the human body to some diseases; secondly, it influences the growth, propagation and spread of some disease organisms or their vectors.

Health Implications of Typhoid

Typhoid disease is one major threat to human life and it critically depopulates a nation. The impacts are highly felt when a greater proportion of the workforce are infected, it reduces their work capacity. The implication or consequence is manifested in prolong health risk and lower productivity. Sawa (2010) confirmed the assertion of Stewart that variability in weather and climate has been shown to have an impact on infectious disease outbreak and spread. The author emphasized that increase in cases of diarrhea is often associated with extreme flooding events. The author further stressed that climate in itself influences the incidences of diseases in two major ways: firstly, it affects the resistance of the human body to some diseases and secondly, it influences the growth, propagation and spread of some disease organisms or their vectors.

The biophysical and socio-economic implications of this disease are indeed enormous and have resulted in several economic setbacks and underdevelopment. Studies on the incidence of typhoid disease require biogeographical considerations because of the spatial character of its spread. Scientific knowledge is required in this analysis and explanations, in order that the philosophical basis of diseases, particularly infectious diseases are known. Climatic vagaries or anomalies determine to a large extent an increase in disease transmission. Climate in its self influences the incidence of diseases in two major ways: firstly, it affects the resistance of the human body to some diseases; and secondly, climate influences the growth, propagation and spread of some disease organisms or their vectors.

The impact of this disease fell sharply with the improved sanitation techniques of the 20th century. First stage: the temperature rises slowly and fever fluctuations are seen with relative bradycardia (slow pulse), malaise, headache and cough. Nose bleeds (epistaxis) are seen in 25% of cases and abdominal pain can occur. There is leukopenia (a decrease in the number of circulating white blood cells), with eosinopenia and relative lymphocytosis. The classic Widal test is negative in the first week. Second stage: the patient lies prostrate with high fever in plateau around 40 °C (104°F) and bradycardia, classically with a dicroticpulse wave. Delirium is frequent; patients may be calm, but sometimes agitated. This delirium gives typhoid its nickname of "nervous fever". Rose spots appear on the lower chest and abdomen in around a third of patients. The Widal test is strongly positive with antiO and antiH antibodies. Blood cultures may be still positive at this stage. (The major symptom of typhoid is that the fever usually rises in the afternoon in the first and second stages, (boundless.com.microbiology<, 2017). Third stage: a number of complications can occur: intestinal hemorrhage due to bleeding in congested Peyer's patches and intestinal perforation in the distal ileum. Fourth stage: by the end of the third week the fever starts subsiding. This carries on into the fourth and final week.

Causes and Spatial spread of Typhoid

Typhoid fever is caused by Salmonella typhi bacteria, serotype-Typhi. Typhoid is transmitted by the ingestion of food or water that has been contaminated with the feces of a person infected by the bacterium. The disease has been known by many names, such as gastric fever, abdominal typhus, infantile remittent fever, slow fever, nervous fever or pathogenic (originating from filth or putrefaction) fever, (Googleweblight.com, 2017). The name "typhoid" means "resembling typhus" and comes from the neuropsychiatric symptoms common to typhoid and typhus. The term "enteric fever" is a collective term that refers to typhoid and paratyphoid. Severe cases of diarrhea might give rise to typhoid in some people. According to Sawa (2010), after series of research, he concluded from the *de new* origin of the fever, from the decomposing liquid evacuation of diarrhea cases, it would mean something more than a coincidence that the believe is now nearly universal among practical physicians that, when the disease is propagated continuously from case to case, it is believed to be so propagated only by the medium of the stools.The disease which is highly contagious can be passed by infected person in their body via their poo or stool, but they are less commonly passed in their urine. Variability in weather and climate has been shown to have an impact on infectious disease outbreak and spread, (Sawa, 2010). Increase in typhoid disease case is often associated with extreme precipitation, particularly in the tropical countries like Nigeria where the disease is linked with warmer temperatures. Sawa (2010) emphasized that increase in related cases such as diarrhea is often associated with extreme flooding events while recent researches link cholera outbreak with warmer temperatures. Umar, (2010) discussed the implications of climate change variability on food security and livelihood in his paper on "climate change": threat to food security and livelihoods in selected states of Northern Nigeria. In it, he considered the ongoing climatic change Issue to have arisen from the

ongoing global warming phenomenon as having a very serious effect on the socio-economic development of Nigeria. Adedayo, Sale and Kekeh (2008) observed that very little attention has been directed at studying the actual health implications of climatic variability in Nigeria.

There are two vaccines licensed for use for the prevention of typhoid: the live, oral Ty21a vaccine (sold as Vivotif Berna) and the injectable Typhoid polysaccharide vaccine (sold as Typhim Vi by Sanofi Pasteur and Typherix by GlaxoSmithKline). For treatment, the rediscovery of oral rehydration therapy in the 1960s provided a simple way to prevent many of the deaths of diarrheal diseases in general, (Googleweblight.com, 2017). It further stressed that where resistance is uncommon, the treatment of choice is a fluoroquinolone such as ciprofloxacin otherwise, a third-generation cephalosporin such as ceftriaxone or cefotaxime. Cefixime is a suitable oral alternative. Antibiotics, such as ampicillin, chloramphenicol, Ciproxin, Amoxicillin and ciprofloxacin have been commonly used to treat typhoid fever. Temperature rises, epistaxis and Widal test is negative IV: Intestinal hemorrhaging can occur

Determination of Clinical and Diagnostic Status of Typhoid

This enteric fever spread through contaminated food, water or close contact but vaccines are recommended where the disease is common. More than 100,000 cases of typhoid are reported every year, (https://www.mayoclinic.org> syc-2, 2020). Clinically, the disease can be diagnosed if the sample of the patient blood is tested for *Salmonella typhi* or *Salmonella paratyphi*, if the patient has fever and feels very ill. Diagnosis is made by any blood, bone marrow or stool cultures and with the Widal test (demonstration of salmonella antibodies against antigens O-somatic and H-flagella). In epidemics and less wealthy countries, after excluding malaria, dysentery or pneumonia, a therapeutic trial time with chloramphenicol is generally undertaken while awaiting the results of the Widal test, and cultures of the blood and stool. The Widal test is time-consuming and often, when a diagnosis is reached, it is too late to start an antibiotic regimen.

Theoretical and Historical Explanations on the Epidemiological Origin of Typhoid

The theory of the origin of typhoid fever goes this way: the cause of the outbreak was attributed to the fact that the slaughter-house of a butcher was situated at the end of the row, into the common sewer of which the blood from his operations was allowed to flow, there to remain and putrefy. The waste-pipes from the sinks were directly connected with this drain without the intervention of any kind of trap, and the smell there from was often horrible. Here, the putrefaction of a highly albuminous liquid, blood, in the drain, and a direct communication between it and the interior of the cottages, seemed to give rise to the fever, (Stewart, 1877). Up till the recent time, Typhoid fever has been reported in several quarters causing lots of death and reducing work productivity in various parts of the world. The paucity of epidemiological data regarding invasive Salmonella disease in Sub-Saharan Africa led the World Health Organization to call for a continent worldwide approach in generating more accurate disease incidence and antimicrobial susceptibility data in 2008.

The question may now be asked in what way is the origin of these cases, apparently arising from some component of putrefying blood, connected with the vast number of typhoid fever cases which appear to arise from the pollution of drinking-water by the excrement of human beings? In this manner, by fixing upon the serum of the blood as the essential factor of the poison, we at once see how any severe case of diarrhea would be sufficient to produce the disease, because the liquid evacuation of severe diarrhea is principally composed of serum of blood, and it is drawn from a source and placed in a condition highly favorable to the development of the putrefactive process. If decomposing blood be capable of giving rise to typhoid fever, and if the decomposing liquid evacuations of diarrhea have the same property, then serum of blood, which is the only component common to both, must be the poison factor. By this process of reasoning, I had already arrived at the conclusion that severe cases of diarrhoea might give rise to typhoid fever in others, before the contribution of fever cases apparently owing this origin to the medical journals. Of this class, are those contributed by Dr. Low in the BRITISH MEDICAL JOURNAL for 1876, vol. i, page 659. Four cases occurred in an isolated house, where " the privy was found running over and so full that the seat could not be used'. He goes on to describe a second group of cases, also four in number. " Two little boys attending a day-school had an attack of diarrhea. One of the boys passed his evacuations in bed, but was able to go to school next morning. The mother of the boys employed a charwoman to assist her in washing the soiled bedclothes. An aunt of the boys also assisted. Within a week, these three persons were seized with symptoms of enteric fever, which developed rapidly and proved fatal to the mother and the aunt. All three were engaged in the cleaning of the soiled linen, and were nauseated by the foul smell of the evacuations." Dr. Low goes on to prove the exclusion of all possible sources of the specific infection from any prior case of the fever, either of the boys or of the women, and at length concludes: "In the absence of any proof to the contrary, we must admit that the disease began from the inhalation of the foetid stools of the boys; that the emanations from these stoolspoisoned the systems of the three individuals who inhaled them, and the filth-fever was generated." In connection with this de nzovo origin of the fever, from the decomposing liquid evacuations of diarrhoea cases, it would seem something more than a

coincidence that the belief is now nearly universal among practical physicians that, when the disease is propagated continuously from case to case, it is believed to be so propagated only by the medium of the stools; (Vide BRITISH MEDICAL JOURNAL, March 25th, 1876, page 383.) In my own management of these cases, I have never found any reason to regret my confidence in this belief. This would also tend to prove that an albuminous liquid is required to propagate and transmit the contagium of the disease to another healthy individual, or why should it not be equally communicated through the medium of the other excretions and secretions of the body? This theory of typhoid fever, arising from the decomposition of the serous evacuations of severe diarrhea, accounts in a more satisfactory manner than any other for the extraordinary prevalence of the fever at a certain period of the year. It is a fact of universal observation that enteric fever cases reach their maximum, in point of numbers, in the months of October, November, and December; and this " periodical disposition" to the disease is accounted for by Liebermeister, who believes that "the real cause of every epidemic and every isolated case of typhoid fever is only the specific poison of typhoid fever" (Ziemssen's Cyclopaedia, vol. i, page 6i), in the following manner. He says (ibid. vol. i, page 65): "The curves representing the frequencyof typhoid correspond to the curves of average temperature, only with this difference-the different points of the typhoid curve follow those of the temperature curve by an interval of some months"; and, in order to account for this discrepancy, he says it takes two or three months for the changes of temperature to penetrate to the breeding places of the typhoid germs. But if it can be shown that typhoid fever may arise from the putrefactive decomposition of blood-serum, then the abundant prevalence of summer cholera, from the end of July to the beginning of September, affords plenty of material for the elaboration of the poison, which afterwards percolates into the wells or is washed by the autumnal rains into the sources of our water-supply.

THE BRITISH MEDICAL JOURNAL (1877) provided that strong impression on the pulmonary pneumogastric nerve sufficed to overturn. The relation of the pneumogastric to the function of equilibration is well known. Dr. Hughlings Jackson has pointed out that the connection of its nucleus with that of the auditory nerve in the medulla, may explain the frequent occurrence of vomiting in the paroxysms of Meniere's disease; and Dr. Ferrier has suggested that there is. Probably a still higher association between the two nerves in the equilibrium centre. The vomiting which accompanies the disturbance of equilibrium, and which is to be attributed to the association with the function of the pneumogastric, is the source, as already stated, of much of the misconception as to the nature of these cases. A few years ago, had the question been asked, what are the commonest causes of paroxysmal vertigo? the invariable answer would have been " A disordered stomach or a diseased brain". It is probable that, even now, the exceptions to such an answer would be comparatively rare. The answer, at any rate, indicates the conditions from which the diagnosis of auditory-nerve vertigo has to be made; for gastric and cerebral disturbances are probably, next to labyrinthine affections, the most common causes of giddiness, and the paroxysms are constantly ascribed to one or the other of those conditions. The gastric associations are especially liable to mislead. The occurrence of vomiting, in the absence of other obtrusive cause of the vertigo, is held as proof of a causal derangement of the stomach. Sometimes, an attack of vertigo may not cause vomiting; it may merely disturb the gastric functions, just as the motion of a ship does with some persons in whom it does not cause seasickness. The dyspepsia which results is regarded as a sufficient cause for the giddiness. But, further, in persons the subjects of auditory vertigo, whose equilibrium nerves and centre are deranged, a primary gastric disturbance seems sometimes to excite a paroxysm of the special vertigo to which they are liable, and the gastric disturbance which thus causes the attack is naturally regarded as its only antecedent. An illustration of this is afforded by the case of a gentleman, who suffers from frequent attacks of intense dyspepsia and vertigo; the former appearing to him to precede and cause the latter. The vertigo is sudden and violent; he has fallen with it, and would fall always if he were not careful. He cannot say to what side he falls; but on one occasion must have fallen to the right, as he grazed the right side of his cheek. He is almost completely deaf on the right side; a watch, in contact with the skull on that side, is quite inaudible. The hearing on the other side seems unimpaired. The deafness came on gradually about twelve years ago. He has been subject from boyhood to attacks of violent dyspepsia, with vomiting and prostration. In his youth they were as severe as they are now; but he never suffered from vertigo until the onset of his deafness. Since that time, the dyspepsia and vertigo have gone on together. The paroxysms of vertigo in this case appear distinctly to be excited on the attacks of gastric disturbance. They are produced by errors in diet, and the long liability to such dyspepsia indicates 'that it is not to be regarded as secondary to the aural affection. But the sequence of the symptom, the coincidence of the liability to vertigo and of the ear-disease, indicates clearly that the giddiness is ultimately due to the influence of the latter, although it is excited by the stomach-derangement. The following case appears to have had a similar origin; viz., the introduction of the products of decomposing blood to the system; in this case, by the water-supply. "A man aged 57 was seized with marked symptoms of typhoid fever, which terminated fatally in about a week, and, upon investigation, it appeared that the drinking water was at fault, though not suspected at the time, as it was derived from a blow well, which, in these districts, is a term applied to water from the calcareous rock."..." Upon examining the premises, I ascertained there was a stable-grating within a few yards of the well, and I requested the owner to have the drain opened. Upon this

being done, the tin pipe through which the water was conducted from the underlying rock was found to be corroded through, and at its base there was an accumulation of refuse from pig-slaughtering, etc., quite sufficient to account for the contamination of the water. I should observe that no other case of typhoid fever had occurred near the spot for some time." In the experiments instituted by M. V. Feltz, and communicated to the Academie des Sciences, upon the effect produced upon dogs by the injection of putrid blood, and alluded to in a contemporary volume, the symptoms produced were very analogous to those we see in typhoid fever. " Putrid blood which had stood for several months was dried and desiccated in the air-bath and mixed with a certain quantity of distilled water, and injected into the crural vein (pertaining to the leg) of three powerful dogs. The animals immediately exhibited marked depression. After a period of incubation of from four to five days, febrile symptoms set in, accompanied by vomiting, loss of appetite, elevation of temperature, bilious and bloody diarrhea, and biliary urine", and these symptoms were produced even when all trace of bacterial life had disappeared from the blood injected. Pondering over the origin of the typhoid cases first mentioned in this paper, my thoughts were directed to the analogies existing between the symptoms present in typhoid fever and those which characterize certain cases of puerperal fever which appear to arise from the introduction of the product of decomposing blood to the system by a channel very much the same as in the case of the experiments on the dogs. In the cases to which I allude, diarrhoea is often one of the first appreciable symptoms, accompanied by high fever, the peculiar typhoid tongue, and, later on, hurried respiration, showing that marked tendency to affection of the lungs which is common to both.

I remember a case of this form of puerperal affection that occurred in a primipara after delivery by the forceps. Two days after delivery, she had a rigor accompanied by severe pain in the abdomen; she recovered after an illness of four weeks, during which time she suffered from symptoms remarkably like an ordinary typhoid attack in all the more important particulars. Unfortunately, as a general rule, cases attacked like this die in the course of a week or ten days, and the further clinical study of them is thus effectually prevented; but so much have some of them resembled ordinary typhoid fever cases of a very severe type that, if it were possible to have over-looked the puerperal condition, they might have been set down as cases of that fever. Of course, the puerperal cases are accompanied by local affections of the organs through which the poison travels before it finally reaches the general body of circulating blood, and this fact seems for a considerable time to have obscured the true nature of these cases by diverting attention from the ultimate general effects upon the system and fixing it too exclusively upon the local expressions of the infection. The different channels by which the poison is admitted to the blood -in the puerperal case through the lymphatics or veins of the uterus, in the typhoid case through the stomach-would to my mind go far to account for any apparent variations in the symptoms. By the first method, the decomposing albuminous matter is admitted more directly, less changed by any chemical process, and in a more recently putrefied, and therefore in a more active condition, to the blood, and thus produces, as we might have expected, much severer effects than when it. is admitted by the second channel, as in the ordinary cases of typhoid fever, as it then has lain in the earth for some time and afterwards (as usually happens) been washed or percolated into the wells, and, after 'being received into the stomach, undergoes the action of the gastric juice before it effects an entrance to the blood.

II. METHODOLOGY

The Study Area

Anyigba town is strategically situated between latitudes 07^0 15´ and 07^0 29´ N, and Longitudes 07^0 11´ and 07^0 32´ E. On the average, Anyigba is on the altitude of 420 meters above sea level. The total land area is about 62.5 km^2.

The climate of Anyigba, based on Koppen's climatic classification, falls within the tropical wet and dry (Aw) climatic region. With a mean temperature of about 25^0 C, rainfall in the area is high during the wet season, and ranges between 1600 - 2000mm, lasting for about seven months, (i.e. between April and October), Ocholi (2015). The area's hydrologic features are determined by the presence, and perhaps the source region of the biggest river in the local governments. The source/watershed of the mysterious lake (*Aabuja*) in the area is Ojofu, a sub-ub of Anyigba, about 1.5Km from the CBD. Boreholes are numerous in the area offering supplementary services to the inhabitants, particularly during the drought periods.

The dominant vegetation type in the area is the tropical savanna woodland; it houses mixtures of scattered tropical trees, shrubs, herbs and grasses.

The soils are mainly of sedimentary origin, (Yusuf, 2005). They are mainly lateritic and with some patches of hydromorphic and rich loamy types. The area is surrounded by low hills, escarpments and sloppy surfaces.

Anyigba is bordered by many communities: Ajiolo and Dekina towns to the north, Egume to the south East, Ologba and Iyale to the north East and Agbeji to the West. The town also has linkages with smaller communities such Etiukpolo, Agala Ate and Agala Ogane, Agbenema, Abadigba and Ojikpadala – Egume.

Using the annual growth rate of 2.5, Anyigba has a projected population of about 95,400.00 persons, (after Ifatimehin, and Ufuah, 2006).

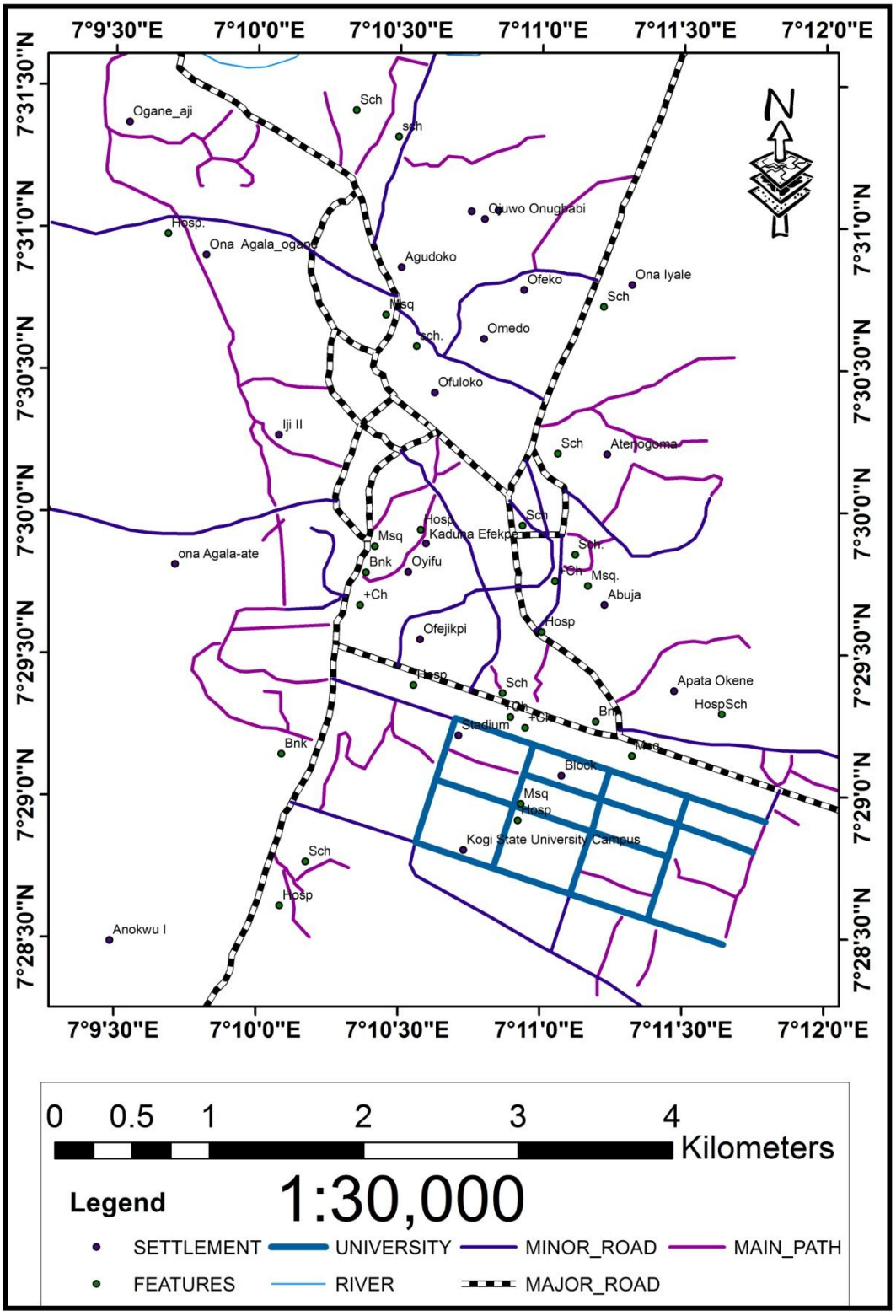

Figure 1: Anyigba and its Regional units**; Source:** GIS laboratory, KSU, Anyigba, (2017).

III. MATERIALS AND METHODS

In this study, data were sourced from both empirical and theoretical backgrounds. A total of 124 patients, from three health institutions in the area were sampled to acquire the desired data for analysis. The three health institutions were drawn from the three geopolitical areas of Anyigba that constitute the largest or most comprehensive/government approved health institutions in the area. These are the Comprehensive Health Center, Anyigba (24 respondents), the Grimard hospital, Anyigba (50 respondents) and the Diagnostic Hospital, Anyigba (50 respondents). The data which were collected spanned over two years (i.e between April 2015 and May 2017). The instrument that was adopted in this study was interview session. The session involved asking selected staff of the health institutions on prepared questions. The interview was randomly conducted at different times of visits, during the working hours while questions were asked during the process. Visits to these health centers were made at different times, mostly during the weekend periods (i.e. Fridays –Saturdays) their less busy periods.

Date Analysis

Tables 1, 2and 3 have been used to show the level ofmedication by the sampled population of people that have been treated with anti-typhoid drugs in the studyarea. While table 1 shows the expected percentage of respondents, table 2 shows the responses by the sampled population at the target of 124.

Table 1: Assumed Mean Percentage of people Likely to have responded to Anti-Typhoid treatment

Category	Level of Medication (%)	[illegible]
Younger people	40	50
Grown up/adult	25	31
Older people	35	43
Total	**100**	**124**

Source: Field work, 2016

Table 2: Sample Population with responses to Anti – Typhoidtreatment

Category	**Number**
Younger people	62
Grown up/adult	24
Older people	38
Total	124

Source: Field work, 2016

Ho: There is no significant difference in the reaction of the people to the two brands of anti-biotic drugs, at 0.05 level of significance.

H1 : There is.In the analysis therefore, both datahave beentransformed into proportions.

Table 3:Overall Proportions of Patients

Category of People	Younger people	Grown-up/Adults	Older people
Overall proportions	0.40	0.25	0.35
Observed proportions of new drugs	0.50	0.19	0.31

N = 124.

Source: Field work, 2016.

Table 4: Cumulative proportions

Category	Younger people	Grown-up/Adults	Olderpeople
Overall Cumulative	0.40	0.65	1.00
Observed cumulative	0.50	0.69	1.00
Difference	0.10	0.04	0.00

Maximum Difference = 0.10

With N = 124, Critical D = 1.36/Square root of N.

1.36/Square root of 124 = 1.36/11.14

= 0.12

IV. DISCUSSION OF RESULTS

The result of this calculation infers that since the critical D of 1.36 is greater than the calculated D of 0.12, the hypothetical statement is thus accepted. Therefore, there is no significant difference between the two brands of anti-typhoid drugs at 95% confidence level. It thus means that the new anti-typhoid drugs conformed to their expectation.The result of this analysis tends to justify the objective of the study that the use of antibiotics in the treatment and prevention of typhoid has been confirmed necessary in order to reduce the negative effects of the disease on the people, particularly the younger onesin the study area. It thus explains thatthe positive

response demonstrated in the application of the anti-typhoid drugs goes a long way to suggest a more permanent way of tackling the deadly disease, especially in the phase of rapidly growing population in the study area. Vaccination and immunization and other forms of hygienic practices could also be an added advantage, in order to avoid or reduce the prevalence.

V. CONCLUSION

The following conclusions have been drawn from the findings in this study in order tojustify the main objectives of this study. In order to avoid continuous loss of lives and finance, public education campaigns to encourage people to wash their hands after defecating and before handling food have been considered as an important component in controlling the spread of the disease. Though a person or a population may become an asymptomatic carrier of typhoid fever, suffering no symptoms, but he or they are capable of infecting others, thus creating anxiety and worries and negatively affecting productivity at work. To ensure in perpetuity a sustainable health situation in the area, a proactive approach through coordinated and a sustained health framework must be maintained by regularly engaging all the stakeholders in the management of typhoid and typhoid related diseases.

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