

## A GEOGRAPHICAL SURVEY OF DETERMINANTS OF HOUSEHOLDS' CHOICES OF DIARRHOEA TREATMENTS FOR UNDER-FIVE AGE IN SOME SELECTED WARDS OF URBAN KATSINA

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### ABSTRACT

*The last decades have witnessed the introduction of geography in diverse public health settings. Even though geographers had long enough study epidemiology when the famous John Snow investigated London's cholera outbreak in 1854 about 159 years ago, paradigm shift precludes the use of its approach in the science of diseases transfer. The aim of the study is to examine the reasons behind the choice of diarrhoea treatments for under-five age children among 394 respondents who were sampled using systematic sampling technique in selected wards of urban Katsina. These respondents were sampled from 5914 households (sampling frames) of Rahamawa, Barhim Estate and GRA wards drawn using multi-stage sampling technique in urban Katsina. Semi structured questionnaire was used to collect data from the respondents. The study found out that the majority of respondents seek health at home using self-administered drugs such as Flagyl and ORS as well as herbal preparations and Islamic remedies. The reasons were because the medicines are not always accessible in the clinics/hospital and lack of money to pay for drugs despite 'free medical programme of the government'. It is recommended that government should checkmate its drugs services, subsidies costly ones and educate people on the dangers of self-medication through household campaigns and mass education.*

**Keywords:** Geographical survey, diarrhoea treatments, households, epidemiology, Katsina

### INTRODUCTION

Until recent the study of diseases and how they are communicated is perceived as 'no go zone' except to epidemiologists and other medical experts. However, recent developments in knowledge and increase in research frontiers have profoundly produced an integrated approach with which diseases as well as their prevalence and how they transfer are studied within a spatial set up. Geographically, especially with the transfer of ideas among researchers, studies of areas and diseases prevalence are now popular and valuable for sound health care policies. From the Snow's study of cholera in 1854 [18], geography has expanded its context to epidemiology and disease transfers within various spatial settings. In virtually all communities, diarrhoeal disease has become a major killer that constitutes high burden especially in low- and middle-income countries (LMIC). World Health Organisation [20] stated that of all medical conditions, diarrhoea is the second leading cause of healthy time lost to illness (72.8 million DALYs). Diarrheal disease remains a leading cause of mortality and morbidity of children in Sub-Saharan Africa, a region where unique geographic, economic, political, socio-cultural, and personal factors interact to create distinctive continuing challenges to its prevention and control. Whereas childhood mortality rates from diarrhoea are expected to decrease by 30 to 50% in most areas of the World between 1990 and 2000, the decline in Sub-Saharan Africa is estimated to be only 3% [9]. Diarrhoea has been

estimated to be responsible for 25 to 75% of all childhood illnesses in Africa [12]. Episodes of diarrhoea lead to about 14% of outpatient visits, 16% of hospital admissions, and account for an average of 35 days of illness per year in children less than five years old [12].

Many factors are responsible for the increase in prevalence of this deadly disease. However improper hygiene and/or refuse disposal and lack of safe drinking water are two highly rated risk factors that may warrant prevalence of the disease or not. Improper refuse disposal was also found to be associated with an increased prevalence of diarrhoea in The Congo [13] and Nigeria [11], [8]. An increased risk of diarrhoea in households lacking soap was found in one study, but this was significant for disease only in children aged 5–14 years during the wet season [11]. The relationship between water source and quality with diarrhoea has been addressed in a number of studies. Globally, more than 125 million children under-five years of age live in households without access to an improved drinking-water source, and more than 280 million children under-five live in households without access to improved sanitation facilities [3]. In the developing world; unsafe drinking water, inadequate availability of water for hygiene and lack of access to sanitation together contribute to about 88 % of deaths from diarrheal diseases or more than 1.5 million children under- five perish from diarrhoea each year [3]. Failure to purify drinking water by filtering, boiling, or the addition of alum was a risk factor for acute diarrhoea in the dry season in only one [11] out of three studies reviewed [7]. Bacteriological studies in rural Nigeria have shown consistent contamination of traditional water sources with faecal coliforms and *streptococci*, albeit varying with the patterns of rainfall [4]. Ponds, rivers, and unprotected springs tend to be more heavily contaminated than protected springs. The source of drinking water has been significantly associated with an increased risk of diarrhoea in a number of studies [8]. A comparative study on differentials of child health in urban areas of Brazil, Egypt, Ghana and Thailand showed that environmental factors such as drinking water sources, availability and quality of water, availability of toilet facility and housing condition are strongly associated with childhood diarrhoeas [19].

Initial therapeutic measures are consistent with and derive from the folk perception of the cause and severity of the disease. The educational level of the mother may also influence decisions. For example, in a study of home management of diarrhoea in Nigeria, Yoruba mothers with a higher level of education were more likely to use a combination of Western and traditional treatments, although very few mothers were inclined to use Western medicine alone [5]. Illiterate mothers in rural Sudan were more likely than literate mothers to stop breastfeeding or use incision and cautery of the gums where teeth are erupting as treatments for diarrhoea [1]. Antimicrobial agents are frequently the first-line treatment of diarrhoea in the home, followed by herbal remedies and, last of all, ORS [15], [16]. One study showed that antibiotics were administered on 54.5% of days with diarrhoea, local herbs on 27.7%, and ORS was only given on 14.8% [15]. Very young children and those with multiple episodes of diarrhoea were more likely to receive combinations of treatment, especially antimicrobial drugs and ORS. Although the frequency of usage varies, antibiotics and herbal teas clearly play a central role in the home management of diarrhoea in several Sub-Saharan countries, even though traditional treatment practices have been associated with a higher risk of death from diarrhoea [16]. A comparative survey of multiple countries in the developing World found that the frequency of home use of ORS in six countries was in the range of 21 to 33% [23]. A notable exception was Lesotho, where two-thirds or more of children with diarrhoea were given ORS and herbal medicine was used much less frequently than in all the other sites [10]. Health centres, hospitals, and private physicians are additional important sources of advice and prescriptions for the therapy of childhood diarrhoea outside the home [2]. However, due to limited access, long waits for attention, misgivings about the

effectiveness of Western medicine, and cultural dependency on traditional methods, the formal health sector is often used as the last resort in many communities [22]. A greater distance from health services was associated with an increased likelihood that no action involving the purchase of an antidiarrheal treatment would be taken for a child's diarrhoea in rural Zimbabwe [6].

### Study Area

Katsina is located some 160 miles east of the city of Sokoto, and 84 miles northwest of Kano, close to the border of Maradi region in Niger [21]. It is one of the North West states of Nigeria that shares its Northern border with the Maradi department in Niger Republic. Katsina covered a landmass of about 142 km<sup>2</sup> [21], is a city (formerly a city-state), a Local Government Area in northern Nigeria and the capital of Katsina State.

The Census results of 2006 in Nigeria put the population of Katsina to 315,459 people and an average growth rate of 2.8% [14].

The climate of the study area is the 'Aw' type as determined by Koppen in which distinctive wet and dry seasons are caused by the fluctuations of the ITCZ (Inter Tropical Convergence Zone) or the ITD south to north (rainy season), vice versa (dry season) and meeting at a front. The ITCZ separates humid maritime air mass originating from the Atlantic Ocean and dry desert air mass. The ITCZ follows the apparent movement of the sun, (northwards in April – July and southwards in September – October). Four seasons are recognized based on the weather and agricultural activities tied to them in the area [17]. Temperature is generally cool in the morning, hot in the afternoon, and very cool in the evening. Maximum temperature range in Katsina is between 29<sup>o</sup>C and 38<sup>o</sup>C but harmattan season (November to February) lowers temperature to about 18<sup>o</sup>C and 27<sup>o</sup>C in the noon.

With the exception of some exotic species planted as ex-situ conservation trees, the vegetation in Katsina area is composed of indigenous species which grow spontaneously. The trees found include *Parkia biglobosa*, *Adansonia digitata*, *Khaya senegalensis*, *Fadherbia albida*, *Tamarindus indica*, and *Borassus aethiopum*, and exotic species *Azadirachta indica*, *Eucalyptus camaldulensis*. Few fruit trees are grown on farms such as *Magnifera indica* and *Anacardium occidentale*.

### METHODOLOGY

The study is a survey research of diarrhoea patients under age of five years in Katsina. All wards of urban Katsina were stratified into low, medium and high income status purposively based on socio-economic determinants, sources of drinking water and sanitation. Using lottery method, three wards which are Rahamawa from low income, Barhim Estate from medium income and GRA from high income wards of Katsina were selected. Multi-stage sampling procedure was employed and all households in the selected wards were enumerated using base maps and trained enumerators from February 2013 and August 2013. After the enumeration, a total of 5914 households of which 3360 are from Rahamawa (low income), 500 are from Barhim Estate (medium income), and 2054 from old GRA (high income) were listed. Systematic sampling technique was used to select each 15<sup>th</sup> order consecutive households from the enumerated households in the wards. These selected households are the sampling frame from which one under-five child is selected for the study. Thus out of each 15<sup>th</sup> order household, one under-five child is selected as respondents. In case where there are more than one under-five children in the same household, one index child was selected using lottery method. Mothers/ care givers of index under-five children who personally decline or did not live at least six-months in the wards prior to the survey were excluded and replaced

by respective respondents in all wards. Table 1 shows the number of respondents in the three wards and their socio-economic status.

**Table 1. Sample of Respondents in three selected wards of Urban Katsina**

<i>Wards</i>	<i>Status</i>	<i>Number of Respondents</i>
Rahamawa	Low income	224
Barhim Estate	Medium income	33
GRA	High income	137
Total		394

Source: Author (2013)

Data were collected using a structured questionnaire which was translated into Hausa language for proper understanding of the respondents. Data was presented in tables and discussed in appropriate sections.

## RESULT AND DISCUSSION

Table 2 depicts respondents' sources of drinking water which are selected purposively because they are common in all study areas. Thus it excludes other sources which the study did not intend to draw analysis from. The sources are exclusive on one another which means that the responses suggests each source is uniquely used to provide drinking water to under-five children in the area.

**Table 2. Sources of drinking water of the index childrens**

<i>Wards</i>	<i>Sources Based on Responses (Exclusively)</i>			
	<i>Well</i>	<i>Borehole</i>	<i>Pipe borne</i>	<i>Water vendor</i>
Rahamawa	135	36	20	33
Barhim Estate	02	13	20	-
GRA	10	08	119	-

Source: Author (2013)

Result showed that because Rahamawa is unplanned, not connected to pipe borne and socio-economically low, most people in that ward used Well water and water from vendor to give to under five. While it is so in the latter, in Barhim and GRA wards pipe borne and home boreholes provide water which the under-five children drink. Well water may be given but after it is boiled in these wards while no mention of boiling is heard from any respondent in Rahamawa. Barhim Estate and GRA are planned quarters and belong to civil servants and elites respectively this is why infrastructure such as pipe borne water and boreholes are provided in the areas.

Table 3 showed the number of diarrhoeal disease episodes among the respondents of the three wards in urban Katsina. Episodes are represented as number of occurrences per total households in all wards.

**Table 3. Frequency of Diarrhoea Cases in all Households in six months**

<i>Wards</i>	<i>Households Diarrhoea Episodes</i>	<i>Percentage %</i>
Rahamawa	137/224	67.83
Barhim Estate	09/33	4.45
GRA	56/137	27.72
Total	202/394	100%

Source: Author (2013)

Episodes are highest in Rahamawa, and GRA respectively. This is not unconnected with sources of drinking water in the areas which are mostly well as well as poor hygiene. Barhim Estate has newest pipes in the ground and thus water may not be contaminated unlike GRA let alone Rahamawa. It is also netter because of well-arranged system of refuse evacuation by private company. With such planning like that of Barhim Estate, episodes can be reduced without huge burden. Episodes of diarrhoea are quite frequent in the area. It is evident that in Sub-Saharan Africa diarrhoea lead to about 14% of outpatient visits, 16% of hospital admissions, and account for an average of 35 days of illness per year in children less than five years old (Kirkwood, 1991). Poor sanitation and sources of drinking water were observed by Timaeus et al. (1995) and Ekanem et al. (1991) as significant causes of increased risk of diarrhoea episodes in Nigeria and urban areas of Brazil, Egypt, Ghana and Thailand.

Sources of diarrhoea treatment vary widely among respondents of the three wards. Results in table 4 represent the respondents' opinion as at July of 2013.

**Table 4. Sources of Diarrhoeal Treatments of the Respondents**

<i>Sources</i>	<i>Responses in Selected Wards</i>		
	<i>Rahamawa</i>	<i>Barhim Estate</i>	<i>GRA</i>
Chemists	77	06	32
Clinic/hospital	43	18	85
Herbal medicines	57	02	04
Medicine vendors	22	-	-
Spiritual healing centres	05	-	05
Islamic healing centres	20	07	11
<i>Total</i>	<i>224</i>	<i>33</i>	<i>137</i>

Source: Author (2013)

While chemist is a main source of treatment among all respondents, people in Rahamawa ward took it as first line. People in Barhim and GRA wards refer to clinics and/or hospitals first when children are ill, and did not patronise medicine vendors at all. This may be because mothers' or care givers of the latter are more educated and socio-economically buoyant as the area is civil servants quarter. The educational level of the mother may also influence

decisions. For example, in a study of home management of diarrhoea in Nigeria, Yoruba mothers with a higher level of education were more likely to use a combination of Western and traditional treatments, although very few mothers were inclined to use Western medicine alone (Brieger, 1990). Little in Rahamawa and GRA refer to spiritual and Islamic healing centres which are gradually mushrooming the urban Katsina. Satisfaction and religious inclinations may be responsible for that. Herbal remedies are also valuable sources of diarrhoea treatment in all areas although figures vary.

A survey of responses showed that ORS and flagyl are the first line treatments used in all wards which are sometimes administered concurrent or otherwise.

**Table 5. First line treatments of Diarrhoeal disease in the Households**

<i>Medicines</i>	<i>Mode of Prescription</i>
ORS only	Self
Flagyl only	Self
ORS and Flagyl	Self
Herbal remedies	Herbal expert
Islamic remedies	Islamic expert

Source: Author (2013)

All the four treatments in table 4 may obviously prescribed by self because of easy access and cheapness except Islamic remedies which may not be self-prescribed because it is well reserved by its practitioners. A study in Lagos South western Nigeria showed that antimicrobial agents are frequently the first-line treatment of diarrhoea in the home, followed by herbal remedies and, last of all, ORS (Oni, 1991). Herbal concoctions are also given to treat diarrhoea in the area. For example, Danjuma (2010) reported the use of species such as *Isoberlina doka* in Kabobi village of Katsina for the treatment of diarrhoea.

Table 6 showed that there are five determinants of choices of diarrhoea treatments based on the responses of the mothers and/or caregivers of the index children in the area.

**Table 6. Determinants of Treating Diarrhoea at Home in Urban Katsina**

<i>Determinants</i>	<i>Number of Respondents</i>	<i>Percentage %</i>
In access to drugs	100	25.38
Attitude of workers to prescription	60	15.23
Cost of orthodox medicines	125	31.73
Culture	37	09.39
Satisfaction with other medicines	72	18.27

Source: Author (2013)

Because certain drugs are inaccessible in the hospital due to shortage or high cost, it is obvious that most of the respondents tend to refer medical cases to elsewhere. It occurs that

patients may be satisfied with other sources because of quick recovery, hospitality and/or cheapness of treatments and thus tend to tilt to such areas for remedies. In this area because of conservative nature of the people, culture may influence decisions although very insignificant in the table. This may be due to increasing access to education. Poor human relation of the workers and assumed passive concern are strong reasons why respondents treat patients at home.

## CONCLUSION

Result of this study showed that diarrhoea has been prevalent and challenging disease in Urban Katsina. However, significant spatial variation occurs in terms of diarrhoea episodes in urban Katsina. For instance it is worrisome to reports 137 episodes out of 224 households in Rahamawa ward while only 9 out of 33 households in Barhim Estate. Although not clinically proven, sources of drinking water of index children strongly affect the episodes in three selected wards of the area. In the area with poor sources, bad sanitation and improper toilet to well arrangement (Rahamawa ward), cases of diarrhoea are more frequent even though other factors may set in. Certain determinants such as access to drugs as well as cost were likely common in urban Katsina and which encourages home based treatments. Disparity in provision of public infrastructure must be addressed in order to minimise a pandemic that knows no boundary in the area.

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