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**Original Research Article**DOI: <http://dx.doi.org/10.22192/ijcrbm.2018.03.01.020>**Comparative study of sources of water supply and disease prevalence among residents of Nkpor communities, Idemili north L.G.A. of Anambra state****Ozims S.J.<sup>1</sup>, Eberendu I.F.<sup>2</sup>, Okoro I.C.<sup>2</sup>, Amah H.C.<sup>3</sup>, Agu G.C.<sup>2</sup>, Ihekaire D.E.<sup>2</sup>, Obasi C.C.<sup>1</sup>, Obioma-Elemba J.E.<sup>2</sup>, Uchegbu U.<sup>4</sup>, Ibanga I.E.<sup>5</sup>, Ezekwesili C.O.<sup>5</sup> and Nwosu D.C.<sup>3</sup>**

1. Department of Public Health, Faculty of Health Sciences, Imo State University, Owerri, Nigeria.
2. Department of Optometry, Faculty of Health Science, Imo, Imo State University, Owerri, Nigeria.
3. Department of Medical Laboratory Science, Faculty of Health Sciences, Imo, Imo State University, Owerri, Nigeria.
4. Department of Medical Microbiology, Federal Medical Centre, Owerri, Nigeria.
5. Department of Chemical Pathology, Federal School of Medical Laboratory Science, Jos, Nigeria
6. Department of Clinical Chemistry, Federal Medical Centre, Owerri, Nigeria.

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**Abstract**

Water ideally should be odourless, colourless, tasteless, clear and without turbidity. It is an essential part of life and is needed in everyday life. Inadequate supply of water most times results in health problems and diseases associated with poor water supply abound in areas predominately inhabited by illiterate population and people of low income and economic status. The aim of this study was to comparatively assess the prevalence of water related diseases and sources of water supply among the residence communities of Nkpor, Idemili North L.G.A, Anambra State. The study is a descriptive cross-sectional study households in communities in Nkpor, Idemili North L.G.A, Anambra State. Multi-stage sampling method was used to select the communities to be studied. At the village level, cluster sampling was used while systematic random sampling was used to select 400 households. The study showed that majority of the respondents were between ages 50-59 (43.25%), majority were married (49.75%), the highest level of education of the respondents was primary school (50.75%). Majority of the respondents were traders (40.5%) and artisans (29.25%). Sources of water were mainly local well (45.57%) and rainfall (32.75%), Prevalence of water-related disease showed that diarrhoea! disease has the highest frequency (56.8%) for Nkpor-Uno and (38.3%) for Nkpor-Agu. The prevalence was high among the residence who were illiterate, traders and artisans. Most of the households were illiterates with low income status. Sources of water were mainly local well and rainfall. Diarrhoea disease was found to be more prevalent among the households in the area when compared with others.

**Keywords:** Sources of water supply, Disease prevalence, Nkpor Communities

## Introduction

Water is defined as a clear, colourless, odourless and tasteless liquid essential for nest plant and animal life [1]. Here prevalence refers to the frequency of occurrence of water related / associated diseases among the residents of Nkpor. Residents refer to le living in Nkpor within the period of this study.

Water present on the surface of the earth in the form of oceans, seas, rivers, lakes, streams and ponds, harvested off buildings, some of the rain waters seeps through the soil below. Sometimes due to high pressure, this water sprouts out in the form of spring. It can also be obtained by digging wells and sinking of boreholes [2]. The different sources of water can be influenced by factors such as seasonal change, proximity to the source of water as well as cost.

Should be sited at least 50 meters and preferably uphill from any potential source of pollution such as pit latrine. There should be water-tight lining of at least 30 feet from the surface. There should be a concrete platform (parapet) about two feet high surrounded by a concrete apron to drain the waste water. There must be a water-tight cover. Water should be drawn by a pump or at least, a permanent bucket attached to the well [3].

Generally speaking, a minimum of 20-40 litres of water per person per day is needed for drinking, personal hygiene and cleaning.

The water should be free from chemical and biological contamination, and should be acceptable in terms of colour, taste and smell in accordance with the WHO Guidelines on the Quality of Drinking Water [4-6].

Each year many children and adults die as a result of lack of access to clean water. Many communicable diseases and many of the poverty-related diseases spread as a result of inadequate access to clean drinking water. According to UNICEF, 3,000 children die every day, worldwide from drinking of contaminated water [7]. Majority of the population affected by these water-related diseases are from the low-socio-economic class with poor standard of living. The problem of poor water supply is made manifest in its incorporation into the Millennium Development Goals (MDG); goal seven, target ten, with the goal of halving the number of people who do not have access to clean water by 2015. Low social class in many cases, the single dominant factor in determining the prevalence of water-borne

diseases. Poor hygiene, ignorance in health-related education, nonavailability of safe drinking water, poor storage facilities for water as well as poor water treatment; all lead to water-borne infections.

Access to an improved water source refers to the percentage of the population with reasonable access to an adequate amount of water from an improved source, such as household connection, public standpipe, borehole, protected well, spring and rainwater collection. Unimproved sources include: mobile water vendors, tanker trucks, unprotected wells and springs. Reasonable access is defined as the availability of at least 20 litres of water for a person a day from a source within a kilometer of the dwelling.

One of the important risk factors for poor health is lack of clean water and it has m major health impacts.

## Specific Objectives

The objectives of the study were to ascertain:

- i) Different sources of water supply among / available to the residents of Nkpor Community.
- ii) If any, the differences in the source of water supply among the residents of Nkpor Uno and that of Nkpor Agu.
- iii) The disease prevalence among the residents of Nkpor in the last one year.
- v) If any, the difference in disease prevalence among the residents of Nkpor Uno and Nkpor Agu in the last one year.
- v) The relationship between disease prevalence and source of water supply among the residents of (i) Nkpor Community (ii) Nkpor Agu (iii) Nkpor Uno (iv) Nkpor Agu and Nkpor Uno in the last one year.
- vi) Other associated factors that aid disease prevalence.

## Materials and Methods

### Study Area

This study was carried out among households and residents of communities in Nkpor, Idemili North L.G.A, Anambra State.

### Study Population

Idemili L.G.A has a total population of 115,110 at the 2006 census. There are about 16,500 households in the study area.

**Study Design**

This research project was basically a cross-sectional descriptive study. It investigated the socio- economic status of households and sources of water supply.

**Sample Size**

The total number of households in the study area was expected to be more than 10,000. The sample size was determined using the Cochran formula

Where n = size of the study

$$Q = (1 - \text{proportion}) = 1 - 0.5$$

$$Z = \text{standard normal deviation} (1.96)$$

$$16$$

P = proportion of target population. This is set at 0.5 •  
 d = degree of accuracy desired: set at 0.05 Thus,  
 $n = 1.96^2 \times 0.5 \times (1 - 0.5)$

$$0.05^2$$

n=384.16 400 households was studied

**Sample Technique**

A multi-stage sampling method was used. Simple random sampling was used to select the communities that were studied. At the village level, cluster sampling method was used for the selection of villages. The households that were studied among the villages were selected by systematic random sampling.

**Method of data collection**

The questionnaires were carried from one community to another by the researchers the respondents in each community were watched closely by the researchers to guide against mistakes.

**Method of data analysis**

The responses of the members of each household from the questionnaire were converted to raw scores and analyzed using simple frequency table.

**Results**

400 households were observed and interview with questionnaires. This represents 100% response rate. Several variations were observed in each household which are tabulated below:

**TABLE 1: AGE OF THE RESPONDENTS IN THE STUDY POULATION**

AGE	NUMBER	FREQ
<20	12	3%
20-29	48	12%
30-39	100	25%
40-49	50	12.5%
50-59	173	43.25%
60 AND ABOVE	17	4.2%
TOTAL	400	100%

**TABLE 2: RESIDENCE OF THE RESPONDENTS IN THE STUDY POPULATION**

SEX	NUMBER	FREQUENCY
MALE	225	56.25%
FEMALE	175	43.75%
TOTAL	400	100%

**TABLE 3: MARITAL STATUS OF THE RESPONDENTS MARITAL**

STATUS	NUMBER	FREQUENCY
SINGLE	168	42%
MARRIED	199	49.75%
SEPARATED	10	2.5%
DIVORCED	10	2.5%
ENGAGED	13	3.25%
TOTAL	400	100%

**TABLE 4: HIGHEST LEVEL OF EDUCATION FOR NKPOR-UNO RESIDENTS**

LEVEL OF EDUCATION	NUMBER	FREQUENCY
PRIMARY EDUCATION	211	52.75%
JUNIOR SECONDARY	133	33.25%
TERTIARY EDUCATION	25	6.25%
TOTAL	400	100%

**TABLE 5: HIGHEST LEVEL OF EDUCATION FOR THE RESIDENCE OF NKPOR-AGU**

LEVEL OF EDUCATION	NUMBER	FREQUENCY
PRIMARY EDUCATION	203	50.75%
JUNIOR SECONDARY	96	24%
SENIOR SECONDARY	63	15.75%
TERTIARY EDUCATION	38	9.5%
TOTAL	400	100%

**TABLE 6: MAJOR OCCUPATION OF THE RESIDENCE OF NKPOR COMMUNITIES**

OCCUPATION	NUMBER	FREQUENCY
UNEMPLOYED	11	2.25%
FARMING	74	18.5%
TRADER	162	40.5%
ARTISANS	119	29.75%
CIVIL SERVICE	12	3.0%
PROFESSIONAL	14	3.5%
CLERGY	8	2.0%
TOTAL	400	100%

**TABLE 7: SOURCE OF WATER FOR DOMESTIC USE AMONG RESIDENTS OF NKPOR-AGU**

WATER SOURCE	NUMBER	FREQUENCY
Rainfall	150	37.5%
Local well	182	45.5%
Stream	1	0.25%
Bore Hole	51	12.75%
Mobile water		
Via vendors	16	4%
<b>TOTAL</b>	<b>400</b>	<b>100%</b>

**TABLE 8: SOURCE OF WATER FOR DOMESTIC USE AMONG THE RESIDENTS OF NKPOR- UNO**

WATER SOURCE	NUMBER	FREQUENCY
Rainfall	125	31.25%
Local well	131	32.75%
Stream	82	20.5%
Bore Hole	30	7.5%
Mobile water	32	8%
<b>TOTAL</b>	<b>400</b>	<b>100%</b>

**TABLE 9: REASONS FOR SOURCE OF WATER FOR DOMESTIC USE AMONG THE RESIDENTS OF NKPOR – COMMUNITIES**

REASON	PROXIMITY	SEASON	COST	SAFETY	TOTAL NUMBER
85		175	54	86	400

**TABLE 10: FREQUENCY OF WATER-RELATED DISEASES AMONG THE RESIDENTS OF NKPOR-COMMUNITIES IN THE LAST ONE YEAR**

DISEASE	NUMBER	FREQUENCY
DIARRHOEA	180	52.2%
TYPHOID	135	39.13%
HEPATITIS A	30	8.6%
<b>TOTAL</b>	<b>345</b>	<b>100%</b>

**TABLE 11: FREQUENCY OF WATER RELETED DISEASES AMONG THE RESIDENCE OF NKPOR UNO IN THE LAST ONE-YEAR**

DISEASE	NUMBER	FREQUENCY
DIARRHOEA	196	56.8%
TYPHOID	125	36.2%
HEPATITIS (A)	25	7.25%
<b>TOTAL</b>	<b>345</b>	<b>100%</b>

**TABLE 12: FREQUENCY OF WATER RELETED DISEASES AMONG THE RESIDENT OF NKPOR-AGU IN THE LAST ONE YEAR**

DISEASE	NUMBER	FREQUENCY
DIARRHOEA	132	38.3%
TYPHOID	185	52.3%
HEPATITIS (A)	28	8.1%
TOTAL	345	100%

**TABLE 13: ASSOCIATION BETWEEN SOURCE OF WATER FOR DOMESTIC USE AND DISEASES PREVDENCE AMONG NKPOR COMMUNITIES IN THE LAST ONE YEAR**

DISEASE WATER SOURCE	DIARRHOEA	TYPHOID	HEPATITIS A
RAINFALL	61	58	8
LOCAL WELL	16	25	7
STREAM	58	28	8
BOREHOLE	12	8	-
MOBILE WATER	33	16	7
TOTAL	180	135	30

**TABLE 14: ASSOCIATION BETWEEN OCCUPATION AND DISEASE PREVELANCE AMONG RESIDENT OF NKPOR-AGU DISEASE**

OCCUPATION	DIARRHOEA	TYPHOID	HEPATITIS A
UNEMPLOYED	4	10	-
FARMING	55	16	-
TRADER	90	83	13
ARTISAN	13	16	17
CIVIL SERVICE	7	6	-
PROFESSIONAL	5	4	-
CLERGY	6	-	-
TOTAL	180	135	30

**TABLE 15: ASSOCIATION BETWEEN OCCUPATION AND DISEASE PREVELANCE AMONG RESIDENT OF NKPOR-UNO DISEASE**

OCCUPATION	DIARRHOEA	TYPHOID	HEPATITIS A
UNEMPLOYED	29	25	8
FARMING	28	16	7
TRADER	66	53	9
ARTISAN	32	18	6
CIVIL SERVICE	10	8	-
PROFESSIONAL	10	9	-
CLERGY	5	6	-
TOTAL	180	135	30

**TABLE 16: RELATIONSHIP BETWEEN DISEASE PREVALENCE AND EDUCATION**

EDUCATION DISEASE	PRIMARY EDUCATION	JUNIOR SECONDARY	SENIOR SECONDARY	TERTIARY EDUCATION	TOTAL
DIARRHOEA	69	46	41	24	180
TYPHOID	36	51	28	20	135
HEPATITIS A	16	8	6	-	30
<b>TOTAL</b>	-	-	-	-	<b>345</b>

**TABLE 17: DISEASE PREVALENCE COMPARED DISEASE PREVALENCE**

DISEASES	NKPOR AGU	NKPOR UNO
DIARRHOEA	33.30%	56.8%
TYPHOID	53.6%	36.2%
HEPATITIS A	8.1%	7.25%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>

## Discussion

A total of 400 questionnaires were shared and retrieved. The result obtained from the questionnaires were analysed and from our table, majority of the respondents fall into age group 50-59 (43.25%), with the age group less than 20 being the lowest (3%). Most of the respondents investigated were more of males (56.25%) than females (43.75%). The marital status of the respondents were; divorced and separated (2.5%), single (42%) married (49.75%) and engaged (3.25%). The highest of education of the respondents recorded and unimpressive of high of (52.75%) primary education and unimpressive low of (6.25%) tertiary education and (33.25%) secondary education for Nkpor-Uno residents. Nkpor agu residents though has the highest no whose education stopped at primary school (50.75%) but has highest / greater no that attended tertiary education (9.5%) the majority of the respondents were mostly traders (40.5%) and artisans (29.75%) with few farmers (18.5%), civil servants (3.0%), clergy (2.0%) and professionals (3.5%). From our table, most of the households in Nkpor communities were found to be of low and middle cases from their occupation and level of educational attainment. Most of the respondents have different sources of water from domestic use because of reasons ranging from proximity to water sources, cost of obtaining water, safety reasons (neither dry or rainy season).

However most of the respondents both in Nkpor-uno and Nkpor-agu were found to depend mostly on rainfall (31.25%)(37.5%) respondent and local well (32.75%)(45.5%) respondent, and followed by

borehole (7.5%) and (12.75%) respondent. The respondents attributed the highest percentage domestic use recorded by rainfall (31.25%)(32.75%) and local well (37.5%)(45.57) to season, as they rely on rainfall mostly in rainy season and local well in dry seasons. In accordance with the paper which examined the effect of rainfall variability on water supply in Anambra Central, water sources became more adequate with interest in amount of rainfall. This was also seen in our study where majority of the respondents indicated high dependence on rainfall water (31.25%)(32.75%) and local well (37.5%)(45.57%) mainly during the rainy season.

A look at the water-related diseases in the table shows that diarrhoea has the highest frequency/ prevalence rate (52.2%) and hepatitis. A infection has the lowest frequency/ prevalence rate(8.6%). This is however slightly higher compared with the result gotten from a sectional study of diarrhoea and it's putative risk factor conducted in Anambra Central, where diarrhoea prevalence ranged from (5%-50%). From the table it is observed that Nkpor-Uno recorded a slight higher diarrhoea prevalence (56.8%) when compared with (38.3%) prevalence of Nkpor-Agu. Their major source of water for domestic use may be a factor responsible for the slight variation as majority of the respondents depend on rainfall water and stream for their domestic water use. The majority respondents that indicated diarrhoea attack in the last one year depend on rainfall and stream for their domestic water supply. The incidences of diarrhoea attack were more among the respondents who were farmers, traders and artisans. This may be due to their low income level as it is observed that respondents who were either

educated or had plum job suffered least attack from the water released diseases. The prevalence of hepatitis A was seen more among the least educated respondent. The fact that majority of the respondents who had had one or more incidence of diarrhoea attack or attack by other water related diseases in the last one year is evidence that ignorance and low income and it's associated poor standard of living as their major factors that aid the transmission of water-related diseases. This agrees with the study to determine the sew-prevalence of anti-hepatitis A antibodies where children from low income class/lower class children had significantly higher rates of infection.

## Conclusion

Findings from our study showed that most of the households belongs to the low and middle classes. Their sources of water ranged from rainfall, boreholes, stream, local well, mobile water vendors and these various sources are influenced by different reasons. Some of the reasons included the cost of obtaining water from the source, the proximity to the water source, the season of the year (whether dry or wet season) and safety of the water source. Most of the households have rainfall as their major source of water, with season and cost as their major reason.

Diarrhoea disease was found to be more prevalent among the people of the area. Most of the households that suffered diarrhoea attack in the last one year sourced their water from rainfall.

Ignorance and low income are one of the factors that determine the prevalence of water-related diseases as the diseases were seen more among the households with low income and poor education.

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