J. ENVIRONMENTAL SYSTEMS, Vol. 31(2) 169-176, 2004-2005

A CRITICAL SURVEY OF WATER-HEALTH PROBLEMS IN THE TERTIARY INSTITUTIONS OF NIGERIA

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ABSTRACT

Water-related health problems were assessed in a survey of four prominent tertiary institutions in Owerri, Imo State, Nigeria, using hospital data on water-related diseases from 2000 to 2004. The most prevalent disease was malaria, followed by diarrhea diseases and enteric fevers. The causes were traced to inadequate water suppliers and poor waste disposal habits among the students. It was also observed that the diseases are not likely to abate until disciplined habits of waste disposal and personal hygiene are inculcated in the students. Mass orientation and mobilization toward these goals are advocated.

INTRODUCTION

Hunger and other disasters notwithstanding, the problem of water supply and management is causing more harm in the developing countries than any other environmental factor. Water-related diseases have become a scourge, killing millions each year and preventing millions more from leading healthy lives, thereby undermining development efforts. Today, over 2.3 billion people suffer from diseases related to water, most of them from third-world countries, including Nigeria [1]. People, especially children, die everyday of diarrhea diseases due to failure to provide clean water [2]. In Nigeria, about 17% of deaths among children

doi: 10.2190/ES.31.2.d
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in 2002 was due to these diseases as reported by Babajide in a keynote address at the World Environment day celebration in Lagos in 2003 [3].

Water-related diseases could be water-borne, water-washed or water-based. There are also water-related insect carriers diseases, all plaguing the health of man. Water-borne diseases are spread through water contaminated with human and animal feces or urine. When one eats food that has been washed with such waters, diseases such as cholera, typhoid fever, polios, round and whipworms, and other diarrheal diseases may follow. These can lead to death after a short while if not properly treated. Water-washed diseases spread as a result of poor personal hygiene, or when the skin or eye makes contact with dirty water. The diseases include trachoma, which can cause blindness in later life, and skin diseases such as scabies. Water-based diseases, on the other hand, spread through water that is contaminated with parasites (worms) either when drunk or when it penetrates the skin usually through open wounds. This group includes schistosomiasis, which can sometimes stunt growth or cause disfiguring and disabling diseases. Water-related insect carrier diseases spread through insects that breed in or near dirty and stagnant water bodies. When these insects bite man, diseases such as malaria, sleeping sickness, river blindness, yellow fever, and other fevers result. Malaria has been found to be the most widespread of all diseases and endemic in about 100 developing countries, putting some two billion people at risk [4].

The incidence of these water-related diseases appear to be increasing in the tropical and sub-tropical regions of the world. In Nigeria, cases have been variously and continuously reported even from our tertiary institutions where hostel living is still obtainable [5]. In response, this investigation was embarked upon to at least know the state of water health in our tertiary institutions where one would think that hygiene and sanitation should have improved; and also to determine the major causes of problems and perchance a way to help control and reduce them. Water health survey is the evaluation of the well-being of a community population based on its access to good water supply [6].

METHOD

An epidemiological case study of tertiary institutions in Owerri metropolis was made utilizing the health records survey method [7]. Data on incidences of water-related diseases among students were gathered from four tertiary institutions within and around Owerri capital territory for the 2000-2004 period. These institutions are well populated and have fully established medical clinics. The institutions used in the study are: 1) Federal University of Technology, Owerri; 2) Alvan Ikoku College of Education, Owerri; 3) Federal Polytechnic, Nekede, Owerri; and 4) School of Nursing and Midwifery, Owerri.

Sources and Water Use in the Institutions

There are three major sources of water supply to these schools. The public supply is pipe-borne stream water treated by the State Water Board and is distributed in buried pipes throughout Owerri Metropolis. Because of the lousy attitude of public state utilities, poor supervision, and incompetent attention to the water works and distribution lines, this source is very unreliable and hardly runs more than once in a week in all the zones. Sometimes it does not give water at all for months. Often the water is too contaminated for drinking purposes. The most popular sources are the nearby streams. Both Alvan College and the School of Nursing live nearby and make use of the Nwaorie stream water that runs round their hostels throughout the year. FUTO is traversed by the Otamiri River, on which it mainly depends. There is a borehole supply works built inside the school but this runs only occasionally. The Polytechnic, like FUTO, is established in a bush and the chief supply of water is wells and tanker supplies which is most often drawn from the rivers.

These are the main sources of water supply to the four tertiary institutions of study in Owerri. Residents use the water for all normal household purposes. They cook, wash, and drink the water. The average student in a hostel uses about 25 liters of water per day. In FUTO where a population of over 2000 is in-hostel, about 50,000 liters of water will be needed. It requires a conscious and direct effort by each school's management to provide adequate water. This they are not doing at the moment. Most often, the students have to go to the streams for water.

It is also noted that the nearness of these schools to the streams and bushes is a very fertile environment for pests and insects to survive and attack the students.

Incidences of water-related diseases reported and recorded in the hospitals (clinics) outpatient attendance registers were tabulated. Interviews and discussions were held with the students, doctors, and nurses of the clinics, to corroborate the records obtained.

Data collected had validity and good reliability since they were gathered directly from the official records of the medical clinics, checked, and certified by their supervisory officials and collected by the researcher himself.

In each year, FUTO had an average of 2,003 students in hostel; 1,163 (56.1%) suffered from water-related diseases of various kinds. The most prevalent disease is malaria with an average of 970 cases per year. Typhoid fever ranks second with an average of 95 incidences per year (see Table 1).

In Alvan, of 3,003 students there are about 2,011 (66.9%) incidences of water-related diseases in hostel per year (see Table 2). The most prevalent disease among them is malaria, seconded by typhoid fever with an average of 85 incidences each year. Malaria predominates and typhoid and diarrheal diseases rank second and a close third.

Table 1. Records of Incidences of Water-Related Diseases in FUTO from 2000-2004

Disease	2000	2001	2002	2003	2004	Total	Average
Malaria	820	908	1054	1153	913	4848	970
Diarrheal diseases	87	76	40	48	62	313	63
Typhoid	80	85	78	81	151	475	95
Hepatitis	7	5	7	5	11	35	7
Cholera	2	1	—	—	12	15	3
Skin infections	19	18	35	13	44	129	26
Total no. of incidences	**1015**	**1093**	**1214**	**1302**	**1193**	**5817**	**1163**
Total in hostel	**2015**	**2000**	**2000**	**2000**	**2000**	**10,015**	**2003**

Table 2. Records of Incidences of Water-Related Diseases in Alvan College of Education, Owerri, from 2000-2004

Disease	2000	2001	2002	2003	2004	Total	Average
Malaria	2015	2114	1816	994	2090	9119	1824
Diarrheal diseases	205	21	55	40	31	352	70
Typhoid	42	44	85	180	75	426	85
Hepatitis	44	3	7	18	11	83	17
Cholera	8	1	1	—	12	22	5
Skin infections	12	2	1	20	20	55	11
Total no. of incidences	**2416**	**2185**	**1965**	**1252**	**2239**	**10057**	**2011**
Total in hostel	**3010**	**3000**	**3005**	**3000**	**3000**	**15015**	**3003**

At Nekede, of about 2,000 students accommodated in several hostels each year, on average 1,105 (52.3%) suffered from water-related diseases annually. Here, too, malaria diseases took the lead, with diarrheal diseases such as dysentery and stomach ache second, and typhoid third (see Table 3).

In the School of Nursing and Midwifery (see Table 4), over 50% of the students suffered from water-related diseases, every year with malaria first and perhaps strangely skin infections second.

Table 5 makes clear that water-related disease rates have not abated despite much publicity in recent years about sanitation and water delivery projects of Nigerian states.

Table 3. Records of Incidences of Water-Related Diseases in Federal Polytechnic Nekede, Owerri, from 2000-2004

Disease	2000	2001	2002	2003	2004	Total	Average
Malaria	591	679	1002	763	932	3967	793
Diarrheal diseases	240	255	195	199	144	1033	207
Typhoid	43	11	14	71	82	221	44
Hepatitis	15	3	18	24	13	73	15
Cholera	4	—	1	—	—	5	1
Skin infections	17	15	8	46	42	128	26
Total no. of incidences	**910**	**963**	**1238**	**1202**	**1213**	**5526**	**1105**
Total in hostel	**2000**	**2000**	**2000**	**2000**	**2000**	**10,000**	**2000**

Table 4. Records of Incidences of Water-Related Diseases at the School of Nursing and Midwifery, Owerri, from 2000-2004

Disease	2000	2001	2002	2003	2004	Total	Average
Malaria	31	25	25	23	27	131	26
Diarrheal diseases	4	2	3	2	2	13	3
Typhoid	1	3	2	4	7	17	2
Hepatitis	—	—	—	1	1	2	—
Cholera	—	—	—	—	—	—	—
Skin infections	7	3	3	4	2	19	4
Total no. of incidences	**43**	**33**	**33**	**34**	**36**	**179**	**36**
Total in hostel	**60**	**60**	**60**	**60**	**60**	**3000**	**60**

CONCLUSIONS AND RECOMMENDATIONS

The findings have revealed that many water-related diseases are attacking many students in higher-education institutions in Nigeria. Water-borne, water-washed, and water-related vector diseases occur. More than 75% of students in all the schools visited are involved. Malaria is the most prevalent of all the diseases in each year followed by the diseases of typhoid and paratyphoid fevers. Diarrheal infections also abound everywhere at all times. The fluctuation in the occurrences with time and space was not regular in any form and could not be reconciled with any particular causes or events.

Table 5. Summary of Results (in Hundreds of Occurrences)

Year	FUTO	Alvan	Polytechnic	School of Nursing	Total
2000	10	24	9	34	47
2001	11	22	9	3	45
2002	12	20	12	3	47
2003	13	13	12	4	42
2004	12	22	12	4	50
	58	**101**	**54**	**18**	

Indications are that water management and sanitation problems are responsible. Frequent failure of public water supplies forces students to fetch from backyard streams and wells or do without water. The quality of waters in these streams and wells (see Table 6) are unacceptable for many purposes by national and international standards [8, 9]. Sanitation is at the lowest ebb and diseases therefore abound.

Malaria is a tropical disease caused by the bite of female *Anopheles* mosquito. The mosquito transmits plasmodium parasites into man. It weakens and debilitates the victim for days and weeks until treatment. The World Health Organization described it as the sickness of the under-developed countries of the world [10]. Mosquitos thrive in damp, warm, stagnant water bodies, gutters, drains and depressions, empty cans and broken bottles (as littered everywhere in hostels), and shrubbery in most tertiary institutions of the country. These are primarily responsible for the ubiquitous presence of these mosquitoes in the schools.

Typhoid and paratyphoid enteric fevers are the resultant effects of poor waste disposal habits. The infections are caused by bacteria transmitted from human or animal feces. Cholera occurs after people had eaten food or drank water that has made contact with feces of infected persons. Such circumstances are precipitated by poor and bad fecal disposal habits found around many tertiary institutions. Bush latrines, partial water system toilets, jam-packed usage of toilets, and all such unsanitary disposal ways found in and around the schools are responsible.

The insufficiency of quality water supply and poor waste disposal habits must be addressed directly. Insufficiency of good water quality supply can be overcome by making water boreholes in each hostel building for the students who live there. The cost of making boreholes in Owerri is not much, as the water-table aquifer which can be tapped is not very deep [12, 13]. The problem of sanitation and toiletry habits can be at least addressed by mass education and demonstration, and by continuous regular cleaning and washing of the facilities. Bi-monthly exercises in this direction followed by persistent talks on the disadvantages of

Table 6. Water Quality Characteristics of Boreholes and Streams from Owerri [11]

Substances	Stream (Otamiri)	Borehole FUTO	WHO Permissible
Color (Pt/co scale)	10.0	5.0	15.0
pH	11	6.5	6.5–8.5
Total hardness (caCo3) (mg/l)	16.56	14.92	250
Sulphate (mg/l)	5.74	0.396	250
Nitrate (mg/l)	0.0008	0.0007	40
Total iron (mg/l)	2.36	0.11	0.3
Lead (mg/l)	0.124	0.02	001
Total suspended solids (mg/l)	58.00	12.50	50.00
Total coliform/100 ml	275	0.0	0.2
Total microbial load/ml	1280	10.00	5–10
Escherichia coli count (MPN/100 ml)	95	0.00	0.00

doing otherwise will go a long way to sanitize the people and their environment. Colleges and universities across Nigeria should take the lead in this regard.

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