Prevalence of Water-Related Illnesses in Tudun Wada and Environs, Jos, Plateau State, North-Central Nigeria

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Abstract: This study investigates the prevalence of water-related illnesses—Malaria, Typhoid, Hepatitis B, Hepatitis C, and Helminthiasis—in the Tudun Wada and environs, Plateau State, Nigeria. A total of 1,122 patients were examined at Kauna Health Clinic between January and June 2024. Results show that 697 individuals (62%) tested positive. Malaria had the highest prevalence (59.11%), followed by Typhoid (29.84%), Helminthiasis (5.74%), Hepatitis B (3.29%), and Hepatitis C (2.01%). The observed high disease burden is strongly linked to poor water quality, inadequate sanitation, and environmental mismanagement. Strengthening public health education, improving water supply systems, and enforcing sanitation regulations are recommended to reduce water-related illnesses in the community.

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I. INTRODUCTION

Safe Drinking Water availability, accessibility and affordability plays a key role in influencing the quality of health of people in any community. The nature and impact of water-related infectious diseases are mediated by both ecological and socioeconomic processes (Eisenberg at al. 2007; United Nations Environment Programme, UNEP, 2007). Access to clean water and proper sanitation is fundamental to human health. Polluted surface waters can contain a large variety of pathogenic micro-organisms including viruses, bacteria and protozoa (Servais P., Billen G., Goncalves A., and Garcia-Armisen T., 2007). Contaminated water sources expose individuals to a range of preventable diseases, including malaria, typhoid, hepatitis, and helminth infections. Infectious disease of human is a serious effect of water pollution in rural countries, which are still developing and where health facilities are seldom found (Nafi'u A., Rebecca O. A., Hizbullahi, M. U., Gani M., and Umar A. A., 2019). The Tudun Wada community in Jos is an unplanned settlement characterized by poor drainage, indiscriminate waste disposal, and reliance on hand-dug wells, creating favorable conditions for waterborne and water-related diseases with growing population.

Water-borne diseases may be considered as deficiencies or disturbances caused by the condition, quantity and quality of the water and their level of incidence depends on factors such as climate, demographics and sanitation (Helia M., Ricardo A., and Paula S., 2023).

This study examines the prevalence of selected water-related illnesses within the community, providing data essential for public health interventions and development.

The main sources of drinking water includes shallow Hand dug wells, Rainfall, Pipeborne water, Mechanized boreholes and Dam water supplied by water vendors. Mostly hand dug wells are shallow as a result of the geology (granitic outcrops) at depth of about 5- 10meters and situated mostly not far from septic pits. Rainfall within this environment starts from April-September annually (six months) and harvested of storage. Pipe borne water supply is only available weekly and not all house hold are connected to the supply as a result of poor planning. Mechanized borehole are few and commercialized even though controlled by the geology of the area. Water vendors buy and sale untreated Dam water supplied by trucks.

Drinking water should not contain disease-causing microorganisms or harmful chemicals. It should be clear, colourless and odourless (www.safewater.org). The water quality is mostly compromised and highly dependent on individuals' ability to treat for desired household use. Rapid population growth has not been accompanied by an increase in the delivery of essential urban services such as water supply, sewerage and sanitation, and collection and disposal of solid wastes. It is estimated that currently only about 50% of the urban and 20% of the semi-urban population have access to reliable water supply of acceptable quality (i.e. something better than a traditional source). Overall effective urban water supply coverage may be as low as 30% of the total population due to poor maintenance and unreliability of supplies. Rural coverage is estimated at 35% (Federal Republic of Nigeria water supply & sanitation interim strategy note November 2000).

Several millions of young children die every year from waterborne disease, particularly from acute diarrheal diseases due to the consumption or using of contaminated food or water (Cissé G., 2019). These diseases can be transmitted to human through four basic routes including waterborne route by the consumption of water directly to the human body, water-washed route by using contaminated water in washing purposes causing contamination of hands or food-plates, waterbased route during the recreational or other activities and insect vector route (McClung R. P., et al., 2017). The global burden of infectious diseases associated with water is considerable, and even in developed and high income countries, it continues to be a concern (Murphy H., et al., 2015). Countries all over the world are concerning with the potential effects of consuming unclean drinking water as it has been proved to be a main cause of numerous water-borne diseases leading to high range of morbidity and mortality especially in undeveloped and developing counties (Clasen T.F., et al., 2015).

II. METHODOLOGY

A cross-sectional correlational study design was employed. Data were extracted from laboratory records of 1,122 patients tested for malaria, typhoid, hepatitis B, hepatitis C, and helminthiasis at Kauna Health Clinic and Maternity between January and June 2024. Simple random sampling was applied to select participants. Data were processed in Microsoft Excel and analyzed descriptively. The study population included both adults and children residing in Tudun Wada and its environs.

III. RESULTS

Out of 1,122 individuals tested, 697 (62%) were positive for at least one water-related illness. Malaria recorded the highest prevalence with 412 cases (59.11%), followed by Typhoid with 208 cases (29.84%). Helminthiasis accounted for 40 cases (5.74%), Hepatitis B for 23 cases (3.29%), and Hepatitis C for 14 cases (2.01%). Monthly patterns showed malaria and typhoid peaking in June, while other illnesses showed relatively low but persistent values throughout the study period. Table 1, presents data of the test conducted, the frequency (Adult/Children and Gender of Patients) and outcome of test (Positive and Negative). Figure 1, also give a graphic cluster histogram chart showing the water related illness from January to June 2024.

Table 1 Records of Water Related Illnesses Obtained from Laboratory Investigation.

MONTH	S/N	TEST	FREQUENCY					OUTCOME OF TEST	
			ADULT		CHILDREN			POSITIVE(+)	NEGATIVE(-)
			M	F	M	F	TOTAL		
JAN	1	MALARIA	27	15	19	6	67	65	2
	2	TYPHOID	22	19	12	5	58	6	52
	3	HEPATITIS B	5	6	1	2	14	2	12
	4	HEPATITIS C	5	0	3	0	8	4	4
	5	HELMINTHISIS	3	2	2	2	9	4	5
		TOTAL	62	42	37	15	156	81	75
FEB	1	MALARIA	30	17	10	12	69	68	1
	2	TYPHOID	17	26	6	17	61	61	0
	3	HEPATITIS B	4	10	0	0	14	1	13
	4	HEPATITIS C	2	5	0	0	7	1	6
	5	HELMINTHISIS	3	1	2	0	6	3	3
		TOTAL	56	59	18	29	157	134	23
MAR	1	MALARIA	40	8	8	6	62	59	3
	2	TYPHOID	25	13	6	5	49	20	29
	3	HEPATITIS B	9	4	0	0	13	5	8
	4	HEPATITIS C	3	3	0	0	6	1	5
	5	HELMINTHISIS	2	2	3	2	9	4	5
		TOTAL	79	30	17	13	139	89	50

|								
	1	MALARIA	32	33	8	8	78	73	5
	2	TYPHOID	28	22	9	5	70	20	50
	3	HEPATITIS B	15	10	1	0	26	5	21
	4	HEPATITIS C	6	8	0	1	15	2	13
APRIL	5	HELMINTHISIS	4	6	5	0	15	8	7
	TOTAL		85	79	23	14	204	108	96
	1	MALARIA	21	31	6	15	73	73	0
	2	TYPHOID	24	26	2	20	77	30	47
	3	HEPATITIS B	26	10	2	7	45	3	42
	4	HEPATITIS C	11	8	1	0	20	3	17
MAY	5	HELMINTHISIS	10	5	7	5	27	12	15
	TOTAL		92	80	18	47	242	121	121
	1	MALARIA	23	33	9	11	76	74	2
	2	TYPHOID	34	23	9	11	77	71	6
	3	HEPATITIS B	11	16	1	1	29	7	22
	4	HEPATITIS C	15	11	1	0	27	3	24
JUNE	5	HELMINTHISIS	5	6	3	1	15	9	6
	TOTAL		88	89	23	24	224	164	60
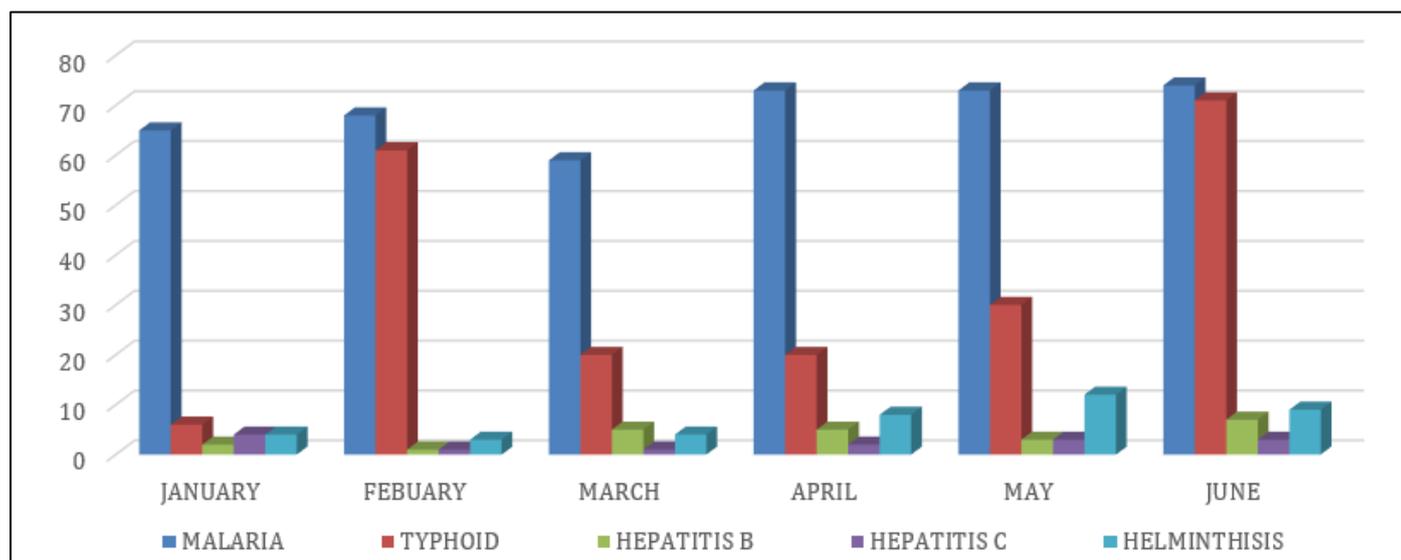
Fig 1 A Cluster Histogram Chart Showing the Selected Water Related Illnesses for January to June 2024.

IV. DISCUSSION

The high prevalence of malaria and typhoid reflects the environmental and infrastructural challenges in Tudun Wada in figure 1. Stagnant water bodies, poor drainage systems, and inadequate waste management contribute to mosquito breeding and contamination of water sources. Lower rates of hepatitis B, hepatitis C, and helminth infections indicate reduced exposure but still highlight ongoing public health concerns. The findings align with WHO reports that inadequate water and sanitation remain major contributors to disease in developing regions.

V. CONCLUSION

Water-related illnesses remain a significant public health challenge in the Tudun Wada community. Malaria and typhoid are the most prevalent due to poor environmental sanitation and compromised water quality. Campaigns that focused on sanitation, hygiene, housing, and nutrition led to unparallel leaps in health and longevity (Szreter, 1988). Targeted public health interventions—including improved water supply, sanitation infrastructure, and community hygiene education—are essential to reducing disease burden. WHO, 2023 estimates that up to 1.4 million deaths annually could be averted with better access to these essential services. The need for increased education management integration, monitoring, and evaluation is highly acknowledged (Van den Berg et al. 2007). Access to safe water, sanitation and hygiene is the most basic human need and well-being (United Nation, 2019).

RECOMMENDATIONS

➢ Establish and enforce drinking water quality regulations.
➢ Implement community-based sanitation and waste management programs.

- ➢ Improve drainage networks to prevent stagnant water accumulation.
- ➢ Conduct regular public health education on water safety and hygiene.
- ➢ Strengthen primary healthcare facilities for surveillance of water-related diseases.

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