Risk factors for Diarrhoeal diseases in the Under Fives in the Rural and Urban Areas of Mbale District: A Cross Sectional -Comparative study.

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Abstract

Background: The prevalence of diarrhoeal diseases is an aspect of public health significance in most parts of the world especially in developing countries like Uganda. Mbale, a district in Uganda has showed the same trend. Outbreaks of common diarrhoeal diseases including dysentery, enteric fevers and cholera are regularly reported among children under five years of age with increased cases of sickness and deaths. Unfortunately, there is also varied and increased prevalence in the rural and urban areas of which the risk factors responsible are unknown. ***Objective:*** The study aimed at evaluating the risk factors for the prevalence of diarrhoeal diseases in the rural and urban areas of Mbale district. ***Materials and Methods:*** A descriptive comparative cross-sectional study was conducted involving rural and urban areas on 790 households (rural=405, urban=385) with cases and non-cases of diarrhoea from June to October 2011. The sample size was estimated using the Kish and Leslie (1965) formula. Data was collected through structured interviews using questionnaires and analyzed using SPSS version 17. Bivariate and Multivariate analyses were also used. ***Results:*** The rural areas had a high prevalence of 59.8% diarrhoeal diseases among children under-fives years of age compared to urban areas with 42.6%. Sanitation facilities such as pit latrines, bathrooms etc. were significantly associated with diarrhoeal diseases prevalence in rural and urban areas e.g. rural homes without pit latrines registered 94.0% (227/242) cases (p-value=0.0053) compared to 5.5% (9/164) without latrines in urban area. ***Conclusions:*** As the rural areas had a higher prevalence compared to the urban areas, appropriate intervention programs should be formulated focused on the significant risk factors.

Index Terms- Diarrhoea, risk factors, comparative cross sectional study, under-fives, rural areas urban areas; Mbale district

1.0 Introduction

The prevalence of diarrhoeal diseases outbreaks is still a public health burden to most countries in the world today. About 4 billion cases of diarrhoea per year cause 1.8 million deaths, over 90% of them (1.6 million) are children under-five years of age (UNICEF, 2005). It is important to note that diarrhoeal diseases kill more than 2 million children a year in the developing world. Many children are left underweight, mentally and physically stunted, and vulnerable to other deadly diseases and too debilitated to go to school. Conservative estimates place the global death toll from diarrhoeal diseases at about two million deaths per year (1.7-2.5 million deaths), ranking third among all causes of infectious disease deaths worldwide. An average morbidity attack rate of 3.2 episodes of diarrhoea per year per child has been reported in some settings in developing countries, this number can be as high as 12 episodes per year per child (WHO,2009). Moreover, repeated episodes of diarrhoeal disease makes children more vulnerable to other diseases (UNICEF, 2005).

In Uganda, over 75% of the disease burden is due to inadequate sanitation practices (MOH,2005). In Mbale district, Diarrhoeal diseases represent 8% of the diseases burden of Mbale district (Mbale DDHS office, 2010). Many studies have suggested a number of interventions to check diarrhoeal diseases outbreaks among the under-fives. A study in Ecuador on Nutritional and Environmental risk factors for diarrhoeal diseases in Ecuadorian children found that the prevalence of the

diarrhoeal disease was significantly associated with hygienic factors like the quality of water, sanitation, and refuse system but not with demographic factors such as sex, attitude, population density and family size (Harold. B., et al., 1993).

Another study suggests that major environmental sanitation aspects like waste disposal, water supply, house-hold and food hygiene are associated with the prevalence of diarrhoeal diseases because of the possibility of disease-causing organisms inhabiting and multiplying in these sources when the conditions are favourable. Such sources offer the best of transmission for diseases agents and therefore, they are a potential danger if not taken care of properly (Fening, K.O and Edoh, D. A, 2009).

A study by Eshete, (2007), in Ethiopia showed that there was a significant association between transportation to and storage of drinking water in the house and the under-five childhood diarrhoeal morbidity. 87% of the households where containers used for transporting and storing drinking water were uncovered were more likely to have children with diarrhoea than the households where the containers were always covered probably because water not covered could easily be contaminated by pets and other vermin Eshete.W.B.,2009**).** In addition, a number of studies by Kyobutungi et al (2007), UNHabitat (2010) and MClennan (1998) , all found that susceptibility to occurrence of diarrhoeal diseases increased in both the rural and urban areas due to lack of many environmental sanitation facilities. There was also observed variation in prevalence of diarrhoeal diseases with rural being worse off than the urban but again with the urban poor, there was a high prevalence (Kyobutungi et al, 2007; UN Habitat, 2010; and MClennan,1998).

In Mbale district, outbreaks of common diarrhoeal diseases including dysentery, enteric fevers and cholera are regularly being reported among under-fives and recent data shows that there is a rising trend in the prevalence of Diarrhoeal diseases in both the rural and urban areas of Mbale district. The combined prevalence of all these diseases in urban areas is at 0.40% compared to the rural areas where the prevalence is at 0.46% (Mbale DDHS Office records, 2010). This trend is responsible for the increased cases of sickness and deaths among the under-fives in the district.

Unfortunately, there is also variation in prevalence in the rural and urban areas of which the risk factors responsible are unknown because no study has ever been carried within this area. This study was therefore carried out in Mbale district and its purpose was to evaluate “the risk factors for the prevalence of diarrhoeal diseases in the rural and urban areas of Mbale.” It involved the urban and rural areas of Mbale i.e. Bunghoko sub-county - rural setting and Industrial division-an urban setting.

2.0 Research Objectives

The study was carried out with the purpose of evaluating the risk factors responsible for the variation in prevalence of diarrhoeal diseases among the children under-five years of age in the rural and urban areas of Mbale district as a basis to suggest appropriate measures to control diarrhoeal diseases.

The study specific objectives were to; 1-investigate factors influencing the prevalence of diarrhoeal diseases in both rural and urban areas of Mbale district, 2-to investigate the role of environmental factors in the prevalence of diarrhoeal diseases in both the rural and urban areas of Mbale district and 3-to evaluate if the difference in socio-economic setup in both rural and urban areas has any influence in the prevalence of diarrhoeal diseases in the under-fives.

3.0 Materials and Methods

A descriptive cross-sectional study with a comparative aspect was carried out in the rural and the urban areas of Mbale district from June 2011 to October 2011. It covered Bunghoko sub county –a rural area situated approximately 15kms from Mbale and the Industrial division-an urban setting found within Mbale town. The study population was confined to households with at least a child under-five with a history of diarrhoea two (2) weeks prior to the survey date, and those without and staff from the health centre and public health department.

The Kish and Leslie (1965) formula was used for estimating the sample size; thus, $n=z^2pq/d^2$ (z=1.96 at 95% CI, p=estimated prevalence =0.4 (urban) or 0.46 (rural), d (the desired level of precision set at 5% =0.05). Hence, a sample size of 790 households was used out of which 405 households were from the rural setting and 385 from the urban setting.

The selection of the subcounty/division was done purposively; multistage random sampling was then used in the selection of the parishes. Two parishes were chosen from Bunghoko subcounty namely; Bumbobi and Buhumwa parishes while two were also chosen from the Industrial division namely; Malukhu ward and Namatala ward. Two villages were then chosen from each parish randomly hence Malukhu ward had Sironko and Muyembe villages, Namatala ward had Sisye and Mvule A&B villages, Bumbobi had Lokii and Nabesa villages and Buhumwa had Nabihomwa and Bufuya villages, in total eight (8) villages were chosen. Using a record from the village health team and LCIs, 790 households were chosen using simple random sampling according to the village population.

Data was collected using observation, interviews, focus group discussion and documents analysis and the tools used were structured interview guides and questionnaires which were administered by both the researcher and the research assistants to respondents who were majorly mothers and care takers of the under-fives in the selected households.

All questionnaires were edited. The data was categorized, coded and then entered into the computer using SPSS version 17. First stage analysis involved obtaining descriptive statistics. Further, bivariate analysis was used to see the level of association between the Independent and the dependent variables. Finally, a multivariate analysis was performed, where a logistic regression model was used to determine the odds ratios and 95% confidence interval for the different risk factors of diarrhoea and describe the strength of association between the selected study variables by controlling for the effect of possible confounders. The logistic regression formula was ran by only selecting those variables that appeared to be statistically significant ($p<0.05$) during bivariate analysis. The regression formula used is given as ; Logit (pi) = $\alpha+\beta1$ (presence of pit latrine) + $\beta2$(presence of bath shelter) + $\beta3$ (presence of household storage facility) + $\beta4$ (Presence of kitchen)+ $\beta5$ (presence of water source) + $\beta6$ (presence of water storage facility)+ $\beta7$ (marital status) + $\beta8$ (level of caretaker) + …..+ βk (Family income level), where Pi is the likelihood prevalence of diarrhoeal diseases. βi are the coefficient values associated with the ith factor in the model, it was possible to interprete the importance of each risk factor.

Before the study, approval and Ethical clearance was obtained from the International Health Sciences University's Research and Ethics Committee, and then the local officials at the Mbale district local government were communicated through a letter from the University's Institute of Health Policy and Management (IHP&M). Informed consent was always obtained from the mothers or the caretakers of the children under five years before conducting the interview. Privacy and confidentiality were maintained during the interview. Mothers of children who were found to be sick during the survey visit were advised to visit the nearby health facility.

4.0 Data Analysis/ Findings

A total of 790 households were visited (405 households from Bunghoko sub county –a rural setting, 385 households industrial division-an Urban setting).

The findings on the socio-demographic characteristics of the respondents in both rural and urban areas of Mbale indicate that the majority of the respondents 72% were aged between 20- 49 years, and the majority of respondents 47% were married. On the level of education, the majority 32% were of primary level followed by those who never went to school 19.7%. This means that the combined group constituted more than a half of all the respondents. and regarding the occupation of the respondents, the highest percentage of the respondents 28.9% were peasants. Again, more than half 53.7% of the respondents were earning less than Ug.shs.500, 000 per month (less than $ 125). (Table I).

Table 1: Socio demographic characteristics of respondents

Table 1: Socio-Demographic characteristics of all respondents, Mbale July 2011		
Variable	**Frequency (N=790)**	**Percentage (%)**
Age category		
10-19	26	3.29
20-29	179	22.70
30-39	213	27.00
40-49	178	22.50
50-59	66	8.35
60-69	69	8.70
70-79	36	4.56
80-89	23	2.90
Marital status		
Single	115	14.56
Married	374	47.34
Divorced	58	7.34
Widowed	126	15.95
Separated	74	9.37
Co-habiting	43	5.44
Level of education		
Never went to school	156	19.75
Primary education	253	32.02
Secondary education	151	19.10
Tertiary education	128	16.20
University	97	12.30
Others*	5	0.63
Occupation		
Peasant	228	28.9
Housewife	169	21.4
Trader	176	22.3
Teacher	88	11.1
Others**	129	16.3
Tribe		
Mugisu	435	55.1
Muganda	68	8.6
Munyole	37	4.7
Mugwere	56	7.1
Japhadhola	11	1.4
Etesot	73	9.2
Others***	110	13.9
Level of household income per month		
Less than 100.000	269	34.05
100.000-499.000	155	19.60
500.000-999.000	66	8.35
Above 1.000.000	300	38.00

Source: ***Field data, 2011***

Key: 1.Others* = Post graduate training ,Informal training

2.Others** = other professional occupations like Health worker, engineer, electrician, carpenter.

3.Others= other tribes like Acholi, Langi, Banyankole, Bakiga, Basoga, Sabiny***

Data on the prevalence pattern of diarrhoeal diseases among the under-fives showed that the highest number of respondents i.e. 59.8% in the rural area had reported that children under five years of age had had diarrhoea in the two weeks preceding the study as compared to 42.6 % in the urban area, therefore the rural setting/area was most hit with diarrhoeal disease prevalence than the urban area (Table 2).

Table 2: Prevalence pattern of diarrhoeal diseases in Urban and rural areas of Mbale district

Diarrhoeal cases in the past 2 weeks	**Rural setting**		**Urban setting**	
	Frequency(n)	Percent (%)	Frequency(n)	Percent (%)
Yes (cases)	242	59.8	164	42.6
No (non cases)	163	40.2	221	57.4
Total	**405**	**100.0**	**385**	**100.0**

Source: ***Field data, 2011***

Bivariate analysis results showed that in the rural areas; rural homes without excreta disposal facilities (pit latrines) registered 94.0% (227/242) cases of diarrhoea with (p-value=0.0053) as compared to 5.5% (9/164) without excreta disposal facilities in urban area. Rural homes without kitchens registered 65.7%(159/242) cases of diarrhoea with (p-value=0.0365) compared to only 32.5%(54/166) without the kitchens. In rural area, rural homes without household waste storage facilities registered 45%(109/242) cases of diarrhoea with (p-value=0.049) compared to 26.8%(44/164) in the urban, The rural homes found not boiling water registered 77.2%(154/242) cases of diarrhoea with (p-value=0.0163) as compared to 73.2%(120/164) in urban.

Rural homes whose state of cleanliness of the floor was dirty registered 63.6% (154/242) cases of diarrhoea with p-value=0.0245 compared to 50% (82/164) in urban (p-value=0.009). Rural homes with family income below half million Uganda shillings (less than $125) registered 38.4% (93/242) cases of diarrhoea with(p-value=0.008) as compared to 25.6% (42/164) in the urban area which consequently shows that the rural area was worse off than urban area.

Finally, the logistics regression analysis (Table 3) showed that the factors that were significant in diarrhoeal diseases prevalence in the rural area were; state of the water source, cleanliness of the house, level of education of the parents or caretakers, household water storage facility, family income level , house hold waste storage facility, presence of bath shelter, presence of the excreta disposal facility, distance of the household storage facility from the household, presence of kitchen, marital status of the parents, presence of the household waste disposal facility (p-values; 0.0041,0.0089,0.0093,0.217,0.224,0.278,0.334, 0.375,0.380,0.436,0.474, 0.0486 respectively).The factor that was not statistically significant was the distance of the excreta disposal facility to the household (p-value= 0.836).

Table 3: Showing the results of the logistic regression analysis for the rural area.

Variables:	B	S.E.	Adjusted OR	95% C.I.for OR	
				Lower	Upper
Excreta disposal facility	-.097	.339	1.181	1.0467	1.763
1. Present					
2. Absent					
House hold waste storage facility	-.057	.203	1.278	1.0635	1.406
1. Present					
2. Absent					
House hold waste disposal method	.151	.217	1.486	1.760	2.781
1. Present					
2. Absent					
Kitchen	.174	.223	1.508	1.0769	1.842
1. Present					
2. Absent					
House hold water storage facility	.373	.302	1.524	1.380	2.625
1. Present					
2. Absent					
Water boiled or not	.261	.251	1.820	1.794	2.120
1. Yes					
2. No					
State of repair of floor	.028	.210	2.018	1.681	2.553
1. Cracked					
2. Smooth					
family income level	.095	.078	2.477	1.943	3.282
1. at least 500,000/=					
2. at most 500,000/=					
level of education	-.008	.089	1.200	1.183	2.380
1. At most P7					
2. At least secondary					
Marital status	.063	.088	1.953	1.896	2.326
1. Once married ***					
2. Single ***					
State of water source	-.140	.171	1.967	1.622	2.320
1. Protected					
2. Un protected					
Distance from house Excreta disposal* facility**	.050	.241	.0930	***0.65	1.686
1. Less than 10m					
2. 10m or more					
bath shelter	.267	.276	1.935	1.760	3.241
1. less than 10m					
2. 10m or more					
House hold waste storage	.233	.265	1.770	1.750	2.123
1. Less than 10m					
2. 10m or more					
Constant	-1.868	1.046	3.192	-	-

Key: B-Coefficient for the Constant (also called the "intercept"),
S.E = Standard error around the coefficient for the constant.

In the urban area, the following factors were found to be statistically significant; family monthly income level, type of water source, marital status, level of education of the care takers, presence of the household storage facility, (p-values; 0.006,0.013,0.0173,0.0228, 0.043 respectively). The age of the child (at p-value=0.859) was the only factor that was found not to be statistically significant with the prevalence of diarrhoeal diseases in the urban areas. (Table 4).

Table 4: Showing results of the logistic regression analysis for the urban area

	B	S.E.	Adjusted OR	95% C.I.for OR		p
Variables:				Lower	Upper	
Level of education of parents						
1.At most P.7	0.100	0.083	1.452	1.0939	1.899	**0**
2.At least secondary						
Marital status						
1.Once married	0.120	0.088	1.858	1.490	2.341	**0**
2.Single						
Age of the child						
1.At most 23 months	-0.017	0.098	0.031	0.811	1.191	**0**
2.At 24 months						
house hold waste storage						
1.Atleast 10m	-0.137	0.174	0.623	0.020	0.922	**0**
2.Atmost 10m						
Type of water source						
1.Protected	-0.663	0.267	6.164	5.306	7.870	**0**
2.Unprotected						
Family income level	-0.046	0.093	0.247	0.179	0.914	**0**
1. Atleast 500,000/=						
2. Atmost 500,000/=						
Constant	0.320	0.700	0.208	-	-	**0**

Key: B-Coefficient for the Constant (also called the "intercept"),
S.E = Standard error around the coefficient for the constant.

5.0 Discussion

Previous studies carried out have revealed that a number of risk factors are responsible for the prevalence of diarrhoeal diseases (UNICEF, 2005; UNICEF, 2009).

A total of 790 households of study subjects were involved and thus 790 questionnaires were administered, 385 study subjects were from the Industrial division (an urban setting) while 405 were from Bunghoko sub-county (a rural area). The socio-demographic information shows that a majority of the respondents 213 (26.9%) were in the age category of 30-39, followed by 20-29 with 179 (22.6%), 40-49 with 178 (22.5%), and then by 60-69(8.73%), 50-59 (8.35%), 70-79(4.60%), 10-19 (3.67%) and 80-89 (2.90%). The age of the caretakers is an important issue to be taken care of because it determines the level of experience and responsibility of the caretakers of the under-fives. In this case, the majority were aged 30-39 years which is a very active, productive age who are likely to play a big role in the control of diarrhoeal diseases. The findings also show that the married formed the greatest number of respondents 374 (47.3%) compared to other categories which was a relatively low proportion among parents/guardians of the children.

Married couples are expected to cope better with sick children than other categories of marital status like single mothers. Indeed, marital status of the mothers /guardians was statistically significant in the prevalence of diarrhoea.

Many respondents, at least 51.1% had studied up to secondary level. The level of education had a very big impact in the occurrence of diarrhoeal diseases as this was statistically significant at both bivariate and multivariate level, the mothers' education in the prevention and control of diarrhoeal diseases among under-fives cannot be over emphasized. This was aptly explained by Shrestha (1997), who stated that "as long as there is a discrepancy between the understanding of the people and the real situation with no one trying to fill the gap the problem of diarrhoeal diseases remains the same." These results furthermore concur with the work of Woldemicael (1995), who noted that caretakers' knowledge was important in the spread of diarrhoeal diseases because it influences child caretaking practices such as breast feeding, bottle feeding.

The findings also show that a majority of the respondents with children with diarrhoea were peasants (28.9%) and majority (53.7%) was earning below ug.shs.500,000 per month which is indicative of a low socio-economic status of the study population. Such a situation is in most cases associated with the high prevalence of diarrhoeal diseases among under-fives. These findings agree with Banjerjee et al (2004), who found that the overall prevalence of diarrhoea was the highest (31.57%) in the lower socio-economic class.

The study revealed that personal factors related to the caretakers and children under-five years like age of the respondents (rural, p-value=0.034; urban, p-value=0.009), marital status of the parents (rural, p-value=0.0236; urban, p-value 0.041) were significant in the prevalence of diarrhoeal diseases both in rural and urban areas. The education level of the parents or the caretakers was another factor that was found to be significant both in the rural areas, and the urban areas, (p-value=0.027 & p-value=0.035 respectively). Family income level was another factor that was highly significant in the rural areas (p-value=0.008) than in the urban areas (p-value=0.708).

Also, the age group of the child under five years influenced the prevalence of diarrhoeal diseases among the under-fives in both rural and urban areas (p-values; 0.034; and 0.009 respectively).

The findings also show that the rural areas were most affected with 242/405 cases (prevalence rate= 59.8%) than the urban areas which had 164/385 cases (prevalence rate =42.6%), the prevalence rate of the rural area was higher than the overall prevalence rate for the whole study population in Mbale district which had 406/790 cases (prevalence rate =51.4%). This is because of the high presence of the prevailing factors namely poor state of the water sources, poor household hygiene, low level of education of the parents and the caretakers, lack of vital basic environmental sanitation facilities like pit latrines, bath shelters, kitchens, household waste storage and disposal facilities like dustbins, refuse/garbage pits, poor socio-economic factors like low household income that are significant in the rural areas hence a high prevalence of diarrhoeal diseases among the under-fives. Part of these findings are in agreement with Schiller (2007), who noted that diarrhoea can also spread from person to person, aggravated by number of people in an area (In our case, the number of households) combined with poor personal hygiene. He disagrees with these findings in that for him, urban location or rural did not matter. These findings take note of the fact that Schiller's study area was in USA which is very significantly different in the hygiene levels both in rural and urban settings from ours.

The study of Fening and Edoh (2009), concurred with current study findings where he indicated that rural areas were more affected than urban area by Diarrhoea diseases. The level of awareness of Diarrhoea diseases aggravated by illiteracy is another major cause of diarrhoea when it comes to developing countries. Due to poverty and consequently poor living standards, food is prepared or stored in unhygienic conditions. The living crowded conditions contaminate food and pollute water which also contributes to the diarrhoeal diseases which on the other hand are more common in urban settings than the rural areas. Feacham (1984), refutes the findings of the current study. He observed hygiene was major cause not the type of location or residence that is either rural or urban location, that hand washing even in Medical institutions showed a lax attitude to personal hygiene. Unlike our findings, Feacham's (1984) study, rejected marital status as a factor that influenced prevalence of diarrhoeal diseases. From Feacham (1984), one can clearly observe that his study was done in an institution where sanitary facilities are better than in our study area.

On the role of environmental factors in the prevalence of diarrhoeal diseases in both the rural and urban areas of Mbale District, the findings reveal that the presence of kitchen, presence of an excreta disposal facility, type of house hold waste storage and disposal method, presence of water storage, treatment of water were influential environmental sanitation factors in the prevalence of diarrhoeal diseases in both rural and urban areas.

The study demonstrated that environmental variables above in the prevalence of diarrhoeal diseases were more influential in rural areas than the urban areas of Mbale district. These factors are biologically plausible in the transmission of diarrhoeal diseases. Indeed, the study concurs with Navaneethan (2008), that diarrhoeal disease was significantly associated with hygienic factors like the quality of water, level of excreta disposal, waste disposal, in remote areas than in urban settings. He found the morbidity rate of the under five children due to diarrhoeal diseases to be higher in the rural areas than in the urban areas.

This research study observed among others that the state of cleanliness of the houses in both rural areas (p-value 0.0245) and urban areas (p-value 0.0098) was a significant factor in diarrhoeal prevalence. It was observed that more dirty homes and consequently higher prevalence of diarrhoea occurred in the rural than urban setting in this population. This observation reflects the general difference in socio-economic situations in rural settings needing policy makers to address these disparities in Mbale district if diarrhoeal diseases among the under-fives have to be effectively controlled. In rural areas, most houses are poorly maintained, with dirty and cracked floors as compared to the urban areas.

In regard to family income levels, low level of family income was significantly associated with the prevalence of diarrhoeal diseases, with the rural areas exhibiting a high prevalence among families with income less 500,000 ($125) per month (p-value 0.008) than the urban areas (p-value 0.708). Family income is important because it helps families to acquire basic resources such as soap; clean water, and other resources that would enable parents to prevent occurrence of diarrhoea, and afford the treatment costs if the children fell sick. The study findings concur with Patel et al., (2009), who

noted that it was in rural areas where more susceptible conditions such as infectious agents that cause diarrhoea are present or are sporadically introduced throughout the surrounding environment than urban areas. He noted that diarrhoea was a rare occurrence for most people who live in urban areas where sanitation is of relatively high quality level, access to safe water is high and personal and domestic hygiene is relatively good. In our findings, diarrhoea is however not rare in urban settings like Mbale. Furthermore, the high cases of diarrhoeal diseases in rural areas in the study at hand may be as a result of majority of respondents living in households with disposal facilities isolated from them which make it easy for under-fives to defecate indiscriminately hence poor environmental hygiene.

This study has highlighted big hygiene gaps in Mbale area, which gaps are driving diarrhoeal prevalence. This is a big challenge for the Health department in the district which must be addressed urgently.

6.0 Conclusion

The study concludes that the rural setting had a higher prevalence (PR=59.8%) compared to the urban settings (42.6%) and higher than overall population prevalence (51.4%)

In the rural setting; poor state of water sources, dirty households, lack of environmental sanitary facilities like pit latrine presence, bath shelters, kitchens and poor household waste storage and disposal facilities were significantly associated with diarrhoeal diseases prevalence.

In urban areas, poor state of households, age of the child, distance of the pit latrines and poor household waste storage and presence of disposal facilities were significant factors.

In both the rural and urban areas, the level of the household monthly income and cleanliness of the household were significant factors in the diarrhoeal diseases prevalence.

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9.0 Competing interests

None declared.

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