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International Journal Water Sciences and Environment Technologies
Vol. (vii), Issue 2, June 2022, pp. 6-17
ISSN Online: 1737-9350; ISSN Print: 1737-6688, Open Access
www.jiste.org
Scientific Press International Limited
Received: 30 March 2022 / Revised: 20 April 2022 / Accepted: June 2022 / Published: June 2022

Basic hygiene and sanitation in schools: case of public primary schools in the municipality of Abomey-Calavi

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Abstract

This work aims to assess the level of mastery of basic hygiene and sanitation practices and their application by actors in public primary schools in the municipality of Abomey-Calavi. Thus, descriptive and analytical methodology has been used. 267 people were surveyed at the rate of 150 learners and 117 resource persons (teachers, headmasters, shop assistants, health workers) in 20 schools. The sampling technique was a systematic random sampling technique. The data collected was analyzed using Excel software and Arc-View software was used to produce the maps. The main results show that in the three school districts of the municipality of Abomey-Calavi, baskets occupy the first place (72%) among the most known and used hygiene kits. Nine (09) schools out of 20 have hand washing kits and more than 80% of learners in each constituency use the same cup to drink water in the canteen and in the classrooms. It is therefore urgent that awareness-raising actions be carried out to bring the actors of the education system to pay more attention to the application of hygiene and basic sanitation rules for a better health of the learners.

Key Words*:* Abomey-Calavi, Basic sanitation, Hygiene, Health, School district

Hygiène et assainissement de base en milieu scolaire : cas des écoles primaires publiques de la commune d'Abomey-Calavi

Résumé

Ce travail vise à évaluer le niveau de maîtrise des pratiques élémentaires d'hygiène et d'assainissement et leur application par les acteurs des écoles primaires publiques de la commune d'Abomey-Calavi. Ainsi, une méthodologie descriptive et analytique a été utilisée. 267 personnes ont été enquêtées à raison de 150 apprenants et 117 personnes ressources (enseignants, proviseurs, vendeurs, agents de santé) dans 20 écoles. La technique d'échantillonnage était une technique d'échantillonnage aléatoire systématique. Les données recueillies ont été analysées à l'aide du logiciel Excel et le logiciel Arc-View a été utilisé pour produire les cartes.
Les principaux résultats montrent que dans les trois circonscriptions scolaires de la commune d'Abomey-Calavi, les paniers occupent la première place (72%) parmi les kits d'hygiène les plus connus et utilisés. Neuf (09) écoles sur 20 disposent de kits de lavage des mains et plus de 80% des apprenants de chaque circonscription utilisent le même gobelet pour boire l'eau à la cantine et dans les salles de classe. Il est donc urgent que des actions de sensibilisation soient menées pour amener les acteurs du système éducatif à accorder plus d'attention à l'application des règles d'hygiène et d'assainissement de base pour une meilleure santé des apprenants.

Mots Clés : Abomey-Calavi, Assainissement de base, Hygiène, Santé, Quartier scolaire

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INTRODUCTION

Health is a factor that conditions any possibility of work and therefore of production and development. The practice of good hygiene and sanitation behavior promotes individual and collective health (GIZ, 2013,). The deterioration of places and conditions influences the health of populations. Indeed, poor hygiene or sanitation is detrimental to the smooth running of activities. Actions on water, hygiene and sanitation are above all preventive, in the same way as other activities such as vaccination. In the education sector, especially at the primary level which is dominated by young and vulnerable children, the adoption of hygiene and sanitation rules must be a priority. Hygiene education programmes are often inadequate (UNICEF, 2015, P.31) and most schools in developing countries do not have sufficient water and sanitation facilities. As a result, poor behaviors and practices such as non-compliance with hygiene measures; air pollution is the main environmental health risk worldwide (WHO, 2012, P4.). Schoolchildren's poor access to hygiene, sanitation and safe drinking water threaten their health and affect their ability to study (R. C. Johnson, 2019, P.1). These problems are considered to be the cause of innumerable health nuisances experienced by the inhabitants, especially young children and even school children who are the most vulnerable. Diseases to be avoided by adopting certain hygienic behaviors such as diarrhea which is the second leading cause of death of children under five and is responsible for 525,000 child deaths per year (WHO, 2018, P. 2). However, young people have important influences on their peers, and they can also spread good behaviors within their families, especially to their siblings (USAID, 2014). Thus, primary school, the place of excellence where children are grouped together, is the most appropriate for the acquisition of good behaviors or a change of behavior in favor of the environment and health. For PS-Eau (2017, P.1), improving hygiene and sanitation conditions in schools impacts children's health, families, and schooling.

In Benin, as part of WASH activities, training is provided to some school actors through the promotion of water advocacy clubs and the creation and maintenance of WASH or hygiene friendly schools. These organizations aim to support teachers in their tasks of developing skills at learner level for behavior change in hygiene and sanitation. Field studies are needed to judge the effectiveness of these actions. It is with the aim of measuring the level of acquisition of hygienic behaviors and their implementation by children, tomorrow's adults that this article is inscribed.

Research Framework

Located in the southern part of the Republic of Benin in Atlantic department, the municipality of Abomey-Calavi is bordered to the north by the municipality of Zè, to the south by Atlantic Ocean, to the east by the municipalities of Sô-Ava and Cotonou, and to the west by the municipalities of Tori-Bossito and Ouidah (Figure 1). It is the largest municipality in Atlantic department of which it occupies more than 20%. It is located between 6°20' and 6°41' of north latitude and between 2°14' and 2°30' of east longitude and covers an area of 539 km², representing 0.48% of Benin's national area (D. Baloubi, 2013, p 56).

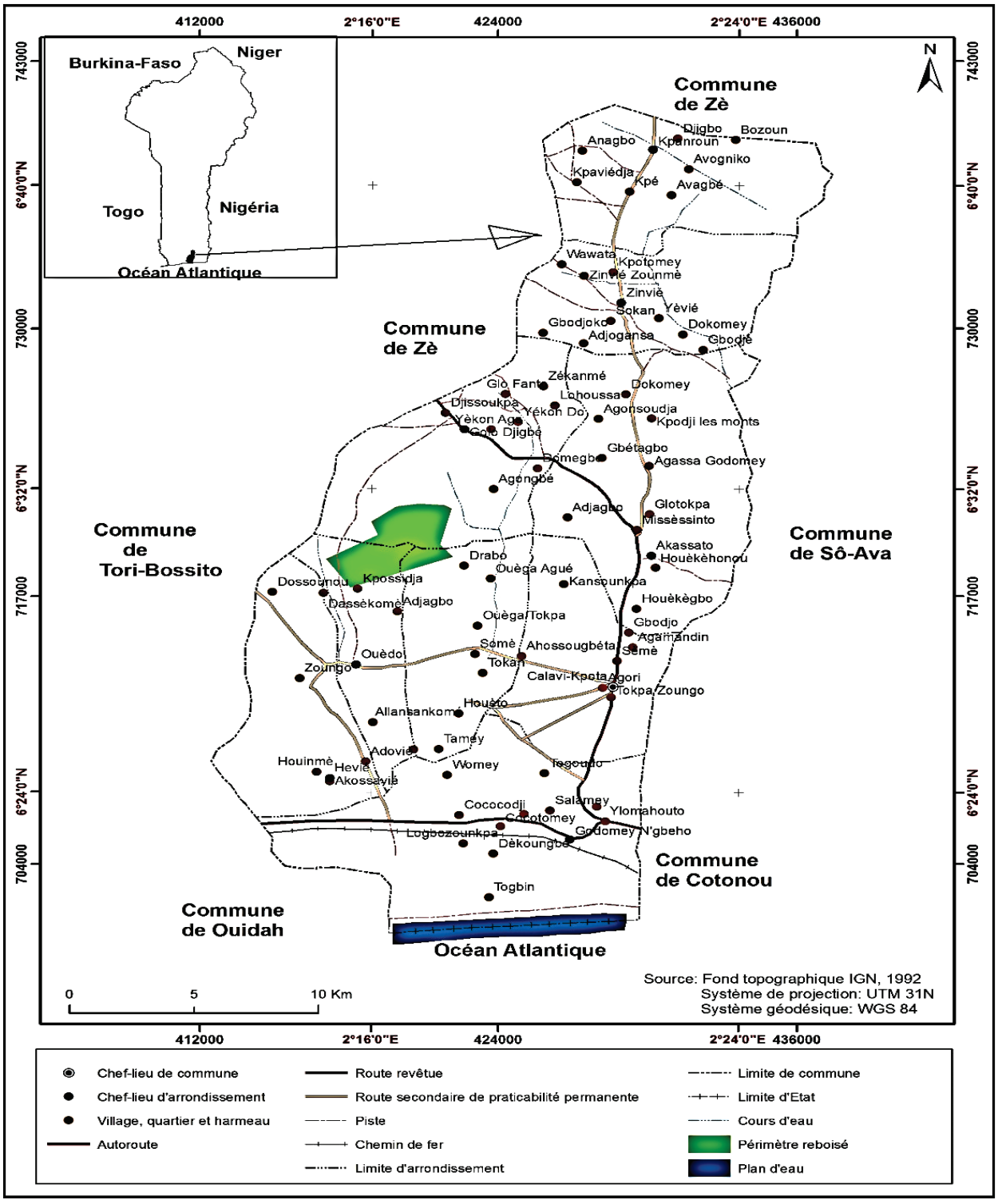

Figure 1: Geographical location of the municipality of Abomey-Calavi
Source: Topographic background, 1992 Illegible writing on the map

MATERIAL AND METHODS

Material: The working equipment consists of a digital camera for instantaneous shots, a GPS (Global Positioning System) for taking the geographical coordinates of the sites and a computer for data entry.
Methods: Both qualitative and quantitative methods were used for a descriptive and analytical cross-sectional study. The data were collected from CM1 learners in the schools included in the study, school principals, teachers, sales assistants from these schools, and then from the health workers of the centers visited by the learners. Also, the follow-up books of the patients in the schools were stripped. Thus, information, data, desk research, sample size determination and fieldwork were carried out.
Data used: Several types of data were collected. These are: school demographic statistics obtained at the level of Abomey-Calavi school district, health statistics (prevalence of illnesses) available in health centers commonly visited by schoolchildren and in notebooks follow-up of school patients.
Documentary research: This was carried out in libraries, documentation centers, research institutions whose activities are related to the theme of this study and on the internet. It enabled us to identify and exploit documents such as dissertations, theses, reports, reviews and maps. These documents provided information on the study area and topics related to basic hygiene and sanitation measures in schools.

- **Sample size:** The sample size was determined by the Schwartz formula (Schwartz, 1995, p. 15).

$$N = Z\alpha^2 . PQ / d^2$$

N = Sample size, Zα = 1,96 Reduced variance corresponding to an α risk of 5%,
P = proportion of pupils concerned (n =5969) in relation to the total number of pupils in the three districts of Abomey-Calavi municipality (N = 64 889). Thus, P = 0,092 i.e. 9,2 %, q = 1-p = proportion of non-responding pupils. Then q = 0.0.908 i.e. 90.8 % i = desired accuracy of 5%; N = $(1,96)^2$ x 0,092X 0,9081 / $(0,05)2$ = 0,3095786 / 0,0025 = **128,36**
Since 128 is the minimum number of learners to survey, we chose to survey 150 learners. These learners were attributed proportionally according to the number of learners per school district and per school chosen. This sample was completed by that of resource persons presented in Table I.

Table I: Breakdown of staff surveyed by category. ***Source :*** *Field survey ; 2020*

School districts	State primary schools visited	Number of learners surveyed by school	Number of saleswomen surveyed by school	Number of ıeadmasters surveyed by school	Number of teachers surveyed by school	Number of health workers in centers visited by schoolchildren
Calavi I	Calavi-center/ A	9	4	1	1	1
	Kansounkpa /A	7	3	1	1	
	Gbétagbo/ A	8	4	1	1	
	Agassa-godomey /A	9	4	1	1	
	Akossavié/ A	10	4	1	1	
Calavi II	Godomeycenter/ A	9	4	1	1	1
	Dèkoungbé /A	8	4	1	1	
	Togoudo /A	12	6	1	1	
	Atrokpocodji /A	6	3	1	1	1
	Zoungacococodji	7	3	1	1	
Calavi III	Alladacomey	7	3	1	1	
	Fandji	4	2	1	1	
	Golo-Djigbe B	7	3	1	1	1
	Espace Saint	9	5	1	1	
	Anagbo	4	2	1	1	
	Handjanaho	5	3	1	1	
	Kpanroun	6	3	1	1	1
	Gbodjoko/A	9	5	1	1	
	Yevié/A	6	3	1	1	
	Adjogansa	8	4	1	1	
	TOTAL	**150**	**72**	**20**	**20**	**5**

In sum, the field survey took into account two hundred and twenty-seven (267) interlocutors scattered among the twenty (20) schools selected in the three school districts of Abomey-Calavi.

- **Field work:** This was carried out using questionnaires. These latter were sent to learners, school principals, health workers and teachers. The interview was conducted with the saleswomen thanks to the interview guides. Direct observation was carried out using an observation grid and made it possible to assess the level of mastery and practice of hygiene rules in public primary schools in Abomey-Calavi.
- **Data processing and analysis of results: The** data obtained are processed using SPSS version 23, Arc-View and the Excel spreadsheet. Descriptive statistics were used to calculate frequencies and averages and to produce tables, graphs and maps. The analysis of the results was descriptive, analytical and comparative.

RESULTS

Hygiene and basic sanitation in public primary schools in the municipality of Abomey-Calavi

Hand washing in public primary schools in the municipality of Abomey-Calavi

Table II summarizes the results of the different handwashing schemes adopted in the public primary schools in the municipality Abomey-Calavi.

Table II: Types of handwashing devices in schools.

Types of works	Number	Percentage (%)
Complete handwashing device	15	14,56
Plastic	86	83,49
Seal	02	01,95
Total	103	100

Source: *Field survey results, September 2020*

It results from table II that a total of 103 handwashing devices were found with plastics predominating (83.49%). It should be noted from the field observations that in some schools, 2 to 3 devices are installed in order to avoid the loss of time for learners. This number is still insufficient, especially during recess. (Plate I).

Photo 1: Handwashing device at Kanssoukpa Photo 2: Handwashing device at Glo-djgbé Photo 3: Handwashing device at Godomey
Plate I: Handwashing devices in some public primary schools
Shooting: Kotcharé, january 2020

Photo 1 shows the hand washing device and photos 2 and 3 show learners washing their hands after recess. These devices are also used by learners at the end of sports activities or when returning from the toilet. As shown in photo 2, the learners do not respect the teachers' instructions. From the field observations, it appears that out of the 20 schools, only 09 have this hand washing device, i.e. 45%.

Clothing and personal care

❖ **Clothing hygiene**

Table III presents the frequency of khaki uniforms washing by learners by district in the municipality of Abomey-Calavi.

Table III: Frequency of khaki uniforms washing by learners in Abomey-Calavi

Washing frequency of the khaki suit	School districts		
	calavi I (%)	calavi II (%)	calavi III (%)
Once a week	89,09	83,93	91,01
Twice a week	10,91	16,07	8,99
Total	100	100	100

Source: *Field survey results, february 2020*

Table III shows that most learners wash their khaki uniforms once a week, i.e. 91.01%, 89.09% and 83.93% respectively in Calavi III, Calavi I, and Calavi II.

❖ **Personal care**

Table iv presents the results of field investigations among learners from the three school districts of Abomey-Calavi on the frequency of bathing in a day.

Table IV: Classification of learners by daily bathing frequency

Daily bathing frequency	School districts		
	Calavi I	Calavi II	Calavi III
	%	%	%
Once a day	08,10	13,33	13,55
Twice a day	63,51	50,67	56,77
Three times a day	28,37	36	29,68
Total	100	100	100

Source: *Field survey results, february 2020*

Table IV shows that learners who stated that they wash twice a day are predominant in the three school districts, in order of importance: 63.51% in Calavi I, 56.77% in Calavi II and 50.67% in Calavi III. Those who stated that they wash three times a day came second and were reported by 28.37% of learners in Calavi I, 36% in Calavi II and 29.68% in Calavi III. As for the learners who testified that they wash once a day, they are in low proportion and expressed by 08.10 % of learners in Calavi I, 13.33 % in Calavi II and 13.55 % in Calavi III.

Drinking water management in public primary schools in the municipality of Abomey-Calavi

❖ **Transport of drinking water from the source to the classrooms**

Field investigations have shown that the transport of water from the source to the classroom is often not done in the best conditions. Figure 2 shows the coverage and non-coverage rates of containers used to transport water.

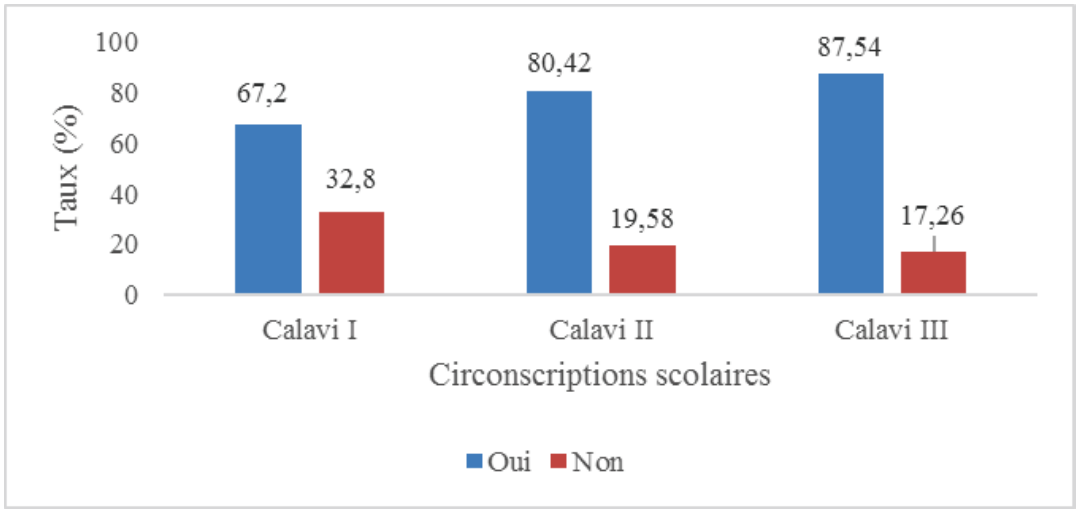

Figure 2: Coverage of container transporting water from source to storage
Source: Field survey results, february 2020.

It can be noted from figure 2 that in the three school districts, the majority of the containers used to transport water from the source to the storage place are covered. Calavi II leads with a rate of 87.54%, followed by school district II with a rate of 80.42%. For water storage in classrooms, almost 100% of containers are covered (Figure 3).

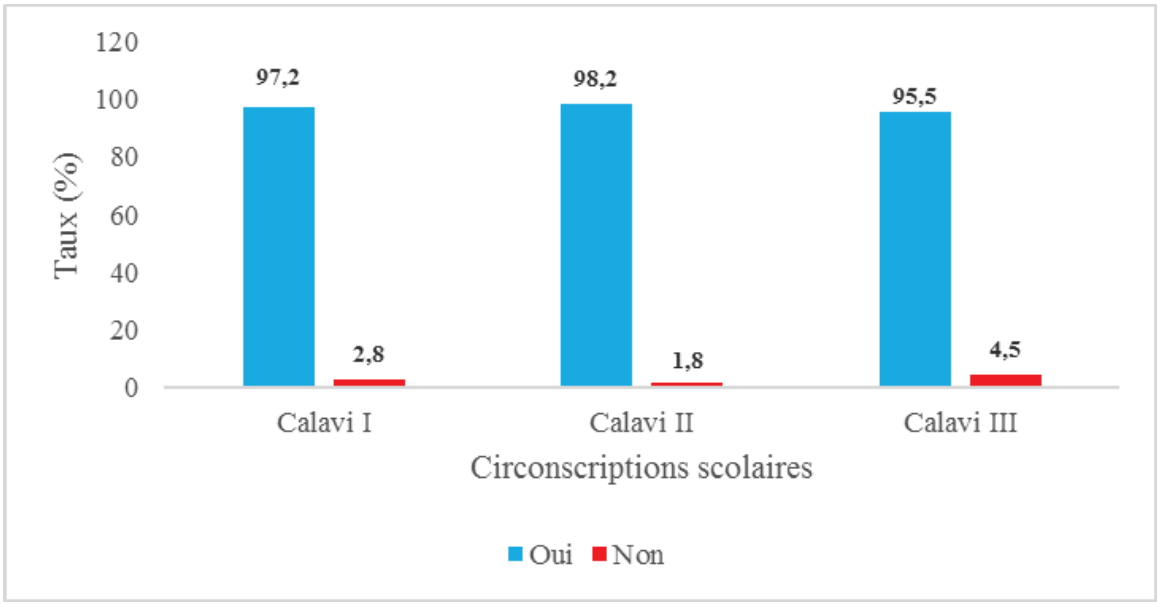

Figure 3: Coverage of water storage container in classrooms by constituency
Source: Field survey results, february 2020

Figure 3 shows that in the school districts of Calavi I, II and III, the water storage containers in the classrooms are largely covered, i.e. 97.2%, 98.2% and 95.5% respectively.

❖ Cleaning of drinking water storage containers before filling

Figure 4 shows the cleaning of drinking water storage containers prior to filling by riding.

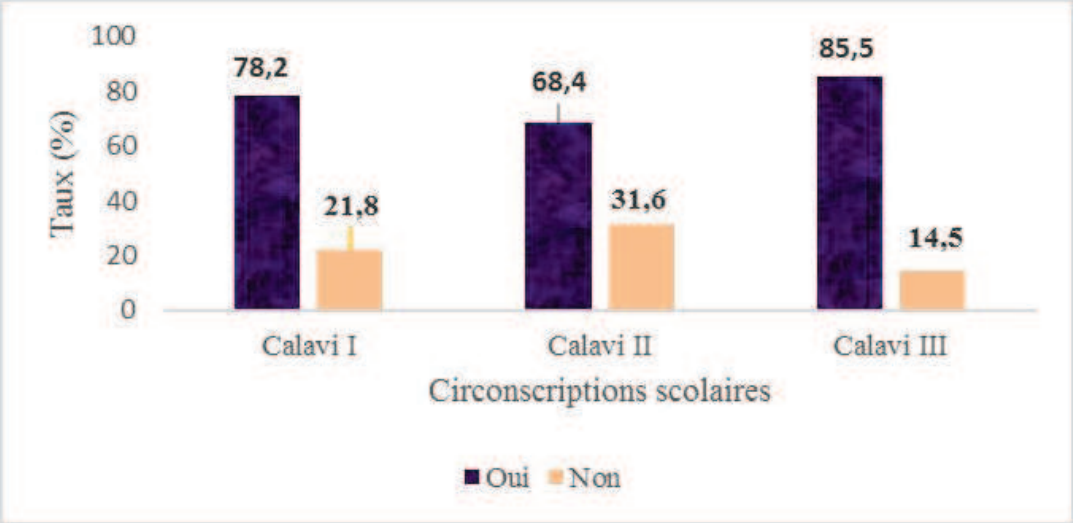

Figure 4: Cleaning the drinking water storage container before filling
Source: Field survey results, february 2020

Figure 4 shows that 78.2% of learners in Calavi I, 68.4% in Calavi II and 85.5% in Calavi III clean the water storage container before filling it. Overall, 77.37% of learners in Abomey-Calavi school district who participated in the field survey said that they clean the water storage container before filling it, against 22.63% who do not do so regularly. This statement by learners is confirmed by 62.5% of teachers surveyed in Calavi I, 80.95% in Calavi II and 71.05% in Calavi III. For the remaining ones, the containers are sometimes cleaned but not always.

❖ **Storage time for drinking water in classrooms**

Figure 5 shows the number of days drinking water was kept in storage containers in public primary schools in the municipality of Abomey-Calavi.

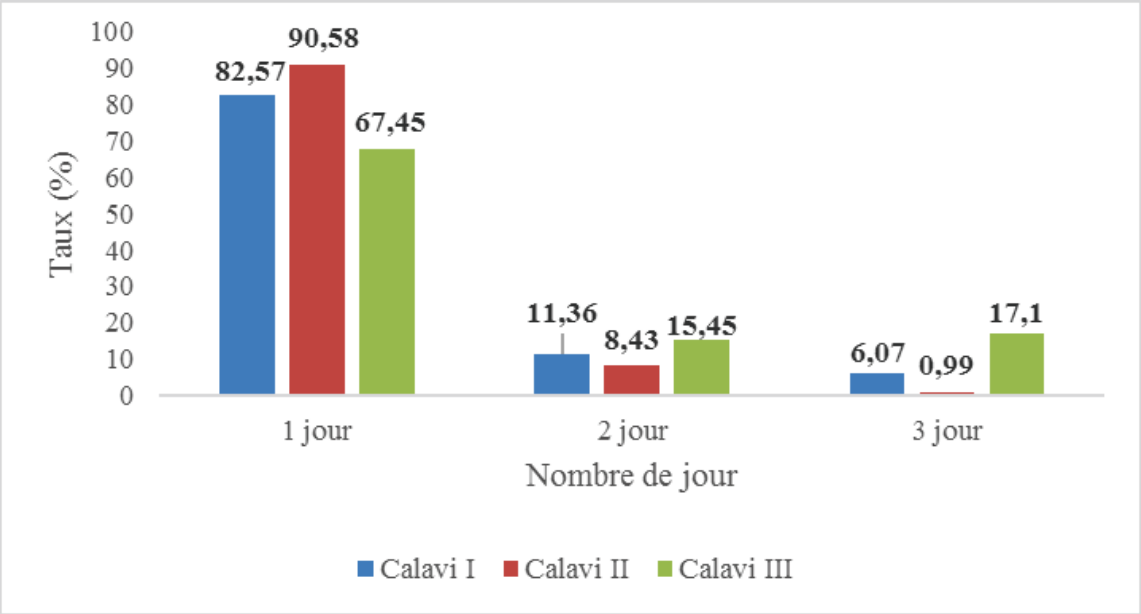

Figure 5: Number of days of drinking water conservation
Source: Field survey results, february 2020

It can be deduced from figure 5 that in the three school districts where investigations were carried out, the renewal of drinking water per day is more frequent, followed respectively by renewal for two and three days, with the exception of Calavi III where it is the opposite.

❖ **Drinking water sampling containers**

Figure 6 shows the use of drinking water containers at the ward level.

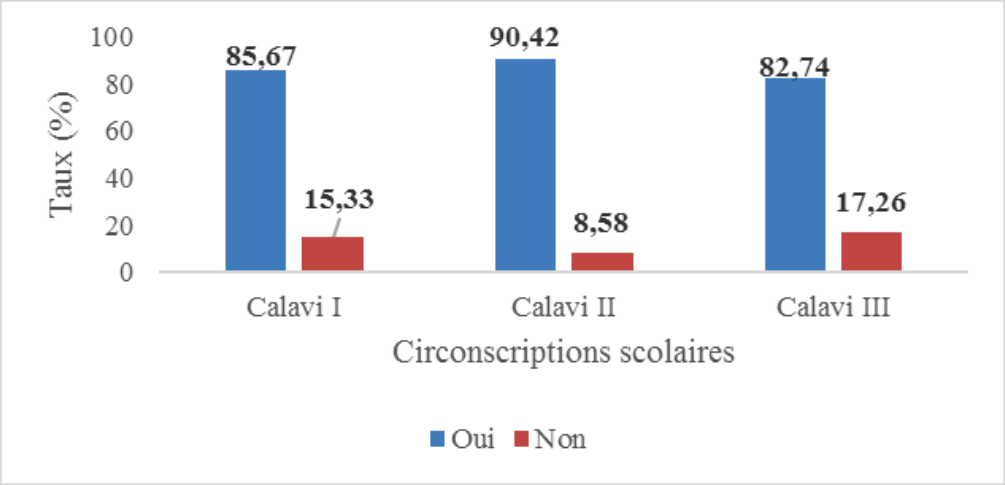

Figure 6: Cup use during recess
Source: Field survey results, january 2020

From figure 6, one can say that the use of a shared cup is the most important in the three districts of the municipality of Abomey-Calavi. More than 80% of learners in each constituency use the same cup to drink water in the canteen and in the classrooms, compared to at most 17% who keep water bottles.

Waste management in public primary schools in the municipality of Abomey-Calavi

❖ **From waste collection to storage**

The observations made during the field investigations in the three school districts of the municipality of Abomey-Calavi show that after cleaning, waste is simply pushed a few meters away on dumps located in a corner of the school or collected using objects such as pieces of cardboard, notebook sheets and covers, or any other object that could be used for collection. The collected waste is thrown directly at the dumpsites located on or near the school yards or is put in bins before being evacuated. Three types of bins are used by learners in the schools visited: baskets, linen bags or metal barrels. Table V presents the types of bins used in the schools.

Table V: Types of bins used in the school districts of the municipality of Abomey-Calavi

	Baskets		Metal barrels		Linen bags		Total	
School districts	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Calavi I	22	47,83	03	100	02	16,67	27	44,26
Calavi II	16	34,78	00	00	02	16,67	18	29,51
Calavi III	08	17,39	00	00	08	66,66	16	26,23
Total	46	100	03	100	12	100	61	100

Source: Field survey results, september 2020

Table V shows that the type of bin most used by learners in the three school districts of Abomey-Calavi is the basket (47.86% in Calavi I, 34.78 in Calavi II and 17.39 in Calavi III). Few schools use linen bags and metal barrels (Photo 4). For the rest of the bins found in the public primary schools investigated, 5% were metal barrels, 20% were linen bags and the remaining 75% were baskets. It can be noted field observations that in the waste bins, paper is the most dominant waste category (photo).

Photo 4: Dustbin at EPP Akassato **Photo 5** : Dustbin at EPP Gbodjoko
Plate II : Waste management materials in public primary schools
Shooting : Kotcharé, 2020

Photo 4 shows a closed metal barrel bin, while photo 5 is a basket bin filled with paper waste.

❖ **Waste disposal and treatment practices**

Field investigations revealed that waste disposal practices in the three districts of the municipality of Abomey-Calavi consisted of pre-collection by voluntary disposal, burning and burial method. The pre-collected waste is mostly thrown out in the open on the rubbish heaps (Photo 6) on or near schoolyards.

Photo 6 : Discharge of waste at a dumping ground near EPP Gbodjoko
Shooting : Kotcharé, 2020

Photo 6 shows a schoolboy bringing waste to a rubbish heap near EPP Gbodjoko. This is the most common method of disposal. 84% of the learners interviewed stated that they dispose of waste on rubbish heaps, 12.76% bury it in the ground and 3.24% burn the waste.

❖ **Places of defecation in public primary schools in the municipality of Abomey-Calavi**

Several types of latrines are used in the public primary schools surveyed (Figure 7).

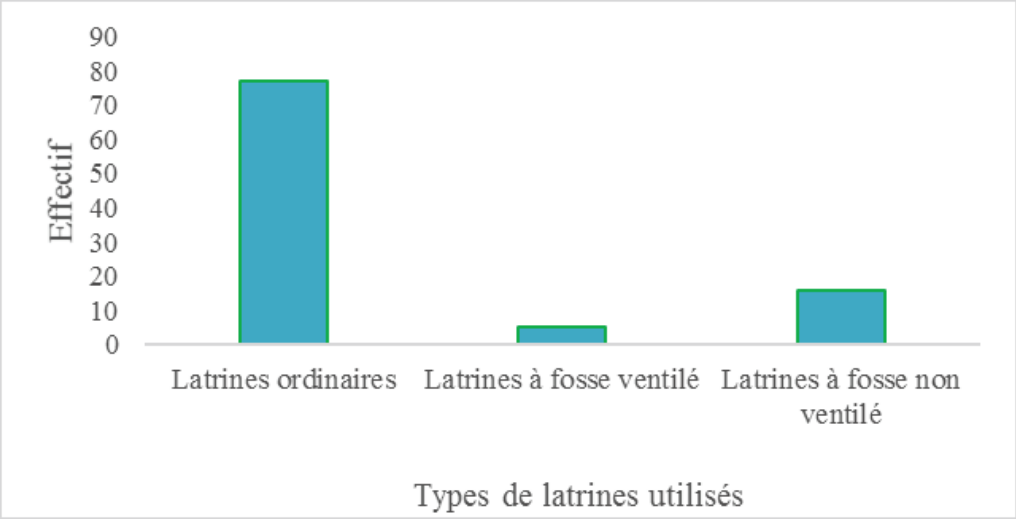

Figure 7: Types of latrines used in State primary schools
Source : Field survey results, septe,ber 2020

As shown in figure 7, three (03) types of latrines are available and used in the schools selected for the research. Thus, it can be concluded that seven (7) out of nine (9) of the latrines are ordinary ones. Ventilated pit latrines represent 5% and non-ventilated 16%.

DISCUSSION

The adoption of hygiene measures shows that 45% of the 20 public primary schools selected for the survey have functional hand-washing facilities. This raises a main problem, especially in this time of pandemic. This result is lower than those obtained by JOHNSON Rock Christian (2019, p.1) in Zè and Lalo. According to the author, the proportion of hand washing in schools is 68% in Zè, and 53% in Lalo schools. This means that in Zè and Lalo, more than half of the schools have adopted this practice despite the fact that the number of devices available in these schools remains insufficient. The mismatch between the number of pupils and the number of hygiene facilities installed leaves much to be desired.

The waste management component shows that all the public primary schools selected for the survey have at least one waste management facility, regardless of their geographical location (rural or urban), and the majority of hygiene materials are baskets (72%). For 84% of learners, the disposal of waste in the rubbish heaps on the school premises or nearby is the most known and used waste management technique. This is consistent with the statistics of the Council of Ministers N°31/2020/PR/SGG/CM/OJ/ORD relating to the performance of operationalization activities of the Waste Management and Sanitation Company of Grand-Nokoué: the SGDS_GN; August 2020 consulted on January 12, 2021, page 2, underlining the fact that 10% of the waste produced was collected. This practice is not likely to guarantee the schoolchildren's health, given that contagious diseases are very numerous today.

Addressing aspects of the relationship between hygiene and health, J. Bartram and S. Cairncross, (2010, p 372) showed that disease burdens can be largely saved by proven and efficient hygiene and sanitation interventions. According to these authors, these disease burdens are related to the lack of good quality water, hygiene and sanitation. The benefits of these interventions are greater than the benefits provided to cure the diseases. Thus, they recommend active involvement of health professionals to accelerate and consolidate progress in maintaining health. The results obtained in the municipality of Abomey-Calavi are, however, contrary to those of M. ASSOGBA ADJE (2018, p 35) who, focusing on sanitation and health, first recalled that health professionals focus more on helping households to ensure their sanitation and to change their behavior. The authors found that improved sanitation has a significant impact not only on health, but also on socio-economic development, especially in developing countries.

In addition, the method of waste management in Calavi makes the environment unhealthy and favors the multiplication of pathogenic germs, exposing learners to numerous environmental diseases.
This proves the studies by H.L.I. +- who found that in the municipality of Lalo, even though people have access to improved water sources, they consume water of poor microbiological quality in their households because of the means of transport and storage of drinking water. The health risks associated with drinking water depend not only on the source of supply but also on the transport and storage of the water at home.
This method of waste management makes the environment unhealthy, promotes the multiplication of pathogens and exposes learners to many environmental diseases.

CONCLUSION

The analysis of hygiene and sanitation measures for learners in state primary schools in the municipality of Abomey-Calavi revealed that all the public primary schools selected for the survey have hygiene tools and sanitation infrastructures. These facilities are insufficient in number and poorly maintained. Ultimately, learners are affected by poor hygiene practices. This implies health consequences for vulnerable learners.
Thus, we notice that in these public primary schools, hygiene and sanitation standards are not always respected according to national and international standards. This situation can be partly explained by the increasing number of learners.

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