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Epidemiological, Clinical, and Evolutionary Profile of Children Admitted to the Pediatric Emergency Department of the Maroua Regional Hospital, Cameroon

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Abstract

Introduction: Pediatric emergencies in developing countries are associated with high morbidity and mortality. The Maroua Regional Hospital (MRH) is one of the referral centers for pediatric emergencies in the Far north region of Cameroon. Pediatric emergencies are frequent in Maroua and are associated with significant mortality. The aim of our study is to determine the epidemiological, clinical, and evolutionary profile of children admitted to the pediatric emergency department of the HRM. **Methods:** We conducted an observational, descriptive, and retrospective study over a period from April 10, 2023 to April 10, 2024, focusing on the records of patients admitted to the pediatric emergency department of the MRH. The variables studied included epidemiological, clinical, and evolutionary characteristics. Data analysis was performed using CSPro version 8.01 and SPSS version 27.0. **Results:** We included 1027 patients; the sex ratio was 1.2 infants under 2 years represented 54.33%. The main reasons for consultation were fever (62.22%) and seizures (30.18%). The most frequently prescribed additional test was the Complete Blood Count (CBC), performed in 97.37% of cases. The most common pathologies were severe malaria (45.18%), broncho-pulmonary infections (15.48%), and bacterial meningitis (12.26%). At admission, 32.9% were transfused. There were 68 deaths, representing 6.67%, and 86% of the deaths occurred within 24 hours of admission. The leading cause of death was severe malaria, with 28 (41.17%) cases. **Conclusion:** Febrile illnesses were the main reason for consultation, and mortality was linked to severe malaria. Therefore, in addition to the other

preventive methods already used against malaria, it is recommended to consider the use of the malaria vaccine.

Keywords

Pediatric Emergencies, Malaria, Cameroon

1. Introduction

Infant mortality remains a major public health issue in Africa. Infant mortality in pediatric emergency departments varies from one country to another and from one study to another: in Mali, it is 26.1%; in the Democratic Republic of Congo (DRC), it is 16%; and in Benin, it is 13% [1]-[3]. According to the WHO, in countries with limited resources, most deaths occur within 24 hours of hospitalization, and most can be prevented [4]. Pediatric consultations account for 25% to 30% of all emergency visits in developed countries, whereas in countries with limited resources, they constitute less than 10% of consultations [5] [6]. Nola T *et al.* [7] evaluated pediatric emergency departments in 7 countries with limited resources, including 13 district hospitals and 8 university hospitals. The main difficulties encountered in these departments were: a problem with the initial triage of patients on arrival, inadequate technical resources and inadequate management of the children received due to a lack of knowledge of the part of the medical staff. In Malawi, the creation of pediatric emergency services has helped to reduce child mortality. Mortality has fallen from 80.5 to 70.5 deaths per 1000 admissions [8]. Another study highlighted the impact of medical triage of patients and staff training in emergency care on reducing mortality and morbidity in children [9]. In Cameroon, the incidence of infant mortality is 48 per 1000 live births, with the Far north region being the most affected, with an incidence of 53 per 1000 live births [10]. The country's social and health conditions remain precarious, and since 2014, the Far north region has experienced social instability with an influx of internal and external refugees, exacerbating poverty and making access to healthcare and equity in care difficult [11]. The MRH is the only referral hospital in the Far north region with an adequate pediatric department and pediatricians. The annex referral hospitals in Kousseri, Yagoua, and Mokolo, created to strengthen the healthcare system in this region, lack sufficient infrastructure and specialized pediatric staff. As a result, the MRH pediatric department experiences a massive influx of patients. To improve the management of pediatric emergency cases and reduce morbidity and mortality among children in the Far North Region, we conducted a study to determine the epidemiological, clinical, and evolutionary profile of children admitted to the pediatric emergency department of the MRH.

2. Methodology

The pediatric emergency department, established in April 2023 at the MRH, has

a capacity of 8 beds and a medical staff consisting of 2 pediatricians, 3 general practitioners, and 5 paramedical personnel. This department receives pediatric medical emergencies around the clock, except for newborns. Initial care is administered without delay using emergency kits. We conducted an observational and descriptive study in the pediatric emergency department of the MRH from April 10, 2023, to April 10, 2024. sampling was exhaustive all patient aged over one month to 15 years who were admitted during the study period and had complete records and who met the inclusion criteria. The minimum sample size was calculated using Cochran's formula: $(n = (t2 \times p \times (1 - p)/m^2)$ using prevalence (p) at 10% corresponding to the prevalence of pediatric emergency consultations in countries with limited resources, t = confidence level according to the normal distribution centered reduced at 95%, equivalent to 1.96. m, the tolerated margin of error of 5% [12]. On the basis of the information available in the various documents consulted in the pediatric emergency department (patient files, registers), the data collection form was defined with inclusion and exclusion criteria. If any information was missing from the files or registers, the patients were excluded from the study. The variables studied included the epidemiological profile (age, sex and patient origin), clinical variables (reason for admission, positive diagnosis, medical complications and comorbidities, para clinical tests, treatment received) and patient outcomes (recovery, discharge against medical advice and death). Data were entered into a template created with CSPro version 8.01 and analyzed using SPSS version 27.0. Qualitative variables were presented as frequencies and percentages, while quantitative variables were presented with means and standard deviations. The association between qualitative variables was tested using the chi-square test when the sample size was greater than 5 or Fisher's exact test when it was not. P-values < 0.05 were considered statistically significant. We submitted the study protocol to the hospital management and began data collection after authorization. The confidentiality and anonymity of patient's were respected. Informed consent was difficult to obtain, given the retrospective nature of study. Severe malaria was defined by any patient with a positive rapid diagnosis test (RDT) or thick drop result and presenting with at least one severity criterion defined by WHO [13]; broncho-pulmonary infections as all infections including bronchopneumonia, bronchitis, pneumonia, pleuro-pneumonia and bronchiolitis. Bacterial meningitis was defined by patient presenting with signs of meningeal irritation and/or a cytobacteriological examination of cerebrospinal fluid that isolated a germ. Discharges against Medical Advice (DAMA) were considered for patients who abandoned treatment during hospitalization and leave without medical consent. Febrile gastroenteritis was defined by patient presenting with diarrhea, vomiting, and fever.

3. Results

3.1. Epidemiological Data

Among the 1040 patients hospitalized in the pediatric emergency department, 1027

met our inclusion criteria. The average number of monthly admissions was 88.33 patients, with peaks in attendance in October (154), September (149), and March (117). These three months accounted for 40.89% of admissions (Figure 1). The sex ratio was 1.2 in favor of males. The age group < 2 years was the most represented, with 54.34%, followed by the 2 - 5 years age group with 30.96% (Table 1).

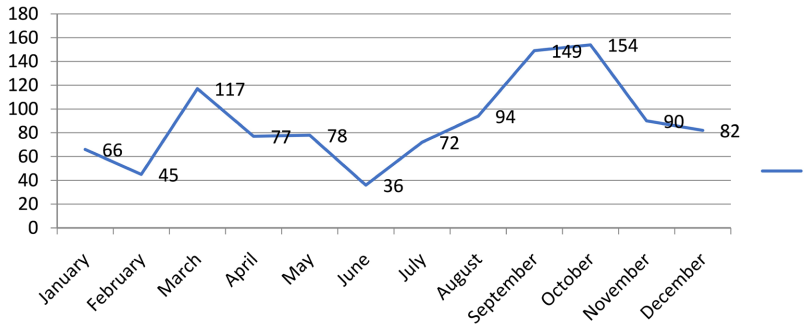

Figure 1. Monthly admissions.

Table 1. Epidemiological data of patients.

Socio-demographic Variables		Frequency	Percentage %
Ages	< 2 years	558	54.35
	>2 – 5 years	318	30.54
	>5 - 10 years	98	9.54
	>10 – 15 years	53	5.16
	Total	1027	100
Gender	Males	571	55.59
	Females	456	44.40
	Total	1027	100
Origin	Urban Zone	731	71.17
	Rural areas	296	28.82
	Total	**1027**	**100**

3.2. Clinical and Therapeutic Data

The main reasons for consultation were fever 639 (62.22%), convulsions 310 (30.8%), respiratory difficulties 117 (11.39%), cough 61 (5.91%), and then diarrhea in 56 (5.45%). The main conditions were severe malaria (45.18%), bronchopulmonary infections (15.48%), and bacterial meningitis (12.26%) (Table 2). The average length of hospital stay was 2 ± 2.67 days, with extremes of 1 to 15 days. The most frequently prescribed additional tests were a Complete blood count (CBC) (97.37%), followed by C-reactive protein (CRP) and Rapid diagnostic tests (RDTs) for malaria, in 70.78% and 51.60% of cases, respectively. The treatment received during their hospitalization were antibiotics 631 (61.14%), and antimalarial treatment 513 (50%). Blood transfusions were administered to 338 (32.91%)

patients with severe anemia, 7 (0.68%) patients received dialysis, and 5 (0.48%) patients received surgical treatment (Table 3).

Table 2. Diagnostics on admissions.

Diagnostics	frequency	Percentage %
Severe Malaria	464	45.18
Broncho pulmonary infections	159	15.48
- Bronchopneumonia/Pneumonia	101	63.52
- Bronchiolite	42	26.41
- Pleuropneumonia	13	8,17
- Asthma	3	1.88
Meningitis	126	12.26
Febrile Gastro entéritis	119	11.58
Dehydration	77	2.53
Severe Acute Malnutrition (SAM) with complication	18	1.75
Vaso-occlusive Crisis	15	1.46
Sepsis	13	1.26
Acute otitis media	11	1.07
Febrile Convulsions	07	0.68
Acute kidney injury	05	0.48
Hepatopathy	04	0.38
Decompensated Congenital heart disease	04	0.38
Others*	05	0.48
TOTAL	**1027**	**100**

*Others: 01 Osteomyelitis, 1 intestinal obstruction, 2 appendicitis; 1 burn.

Table 3. Patients treatments.

Patients treatments		Frequency (n)	Percentage (%)
Medical Treatment	Antipyretic	786	76.54
	Antibiotics	631	61.14
	Anti-malarials	513	49.95
	Blood transfusions	338	32.91
	Anti convulsant	256	24.92
	Dialysis	7	0.68
Surgical Treatment	Digestive surgery	3	0.29
	Orthopaedic surgery	2	0.19

3.3. Patient Outcomes

Transfer to the general pediatric department after patient stabilization was done in 89% of cases. We recorded 45 (4.69%), Discharges against medical advice (DAMA) and the mortality rate was 68 (6.62%). Deaths occurred within 24 hours in 59 (86.76%), cases with the >1 - 23 months age group being the most affected (57.35%). The main causes of death were malaria (41.47%), bacterial meningitis (17.64%), and broncho-pulmonary diseases (16.17%) (Table 4).

Table 4. Patients outcomes.

Patients outcomes	Frequency	Percentage %
AGE		
<2 years	39	57.35
≥2 - 5 years	13	19.11
>5 - 10 years	10	14.70
>10 - 15 years	6	8.82
Total	68	100
Gender		
Male	39	57.35
Female	29	42.64
Total	68	100
Causes of death		
Severe Malaria	28	41.17
Meningitis	12	17.64
Broncho-pulmonary infections	11	16.17
SAM + Complications	5	7.39
Severe Dehydration	4	5.88
Haemorrhages	2	2.94
Congenital heart diseases	2	2.94
Hepatopathy	2	2.94
Total	**68**	**100**

4. Discussion

The pediatric emergency department of the HRM has a lower patient load compared to the data from Aleo *et al.* [3], Mabiala [14], and Laraje *et al.* [15]. This low attendance could be attributed to several factors: on one hand, it is a new department, and surrounding hospitals might not be aware of its existence; on the other hand, the prevailing poverty in the region and cultural factors might limit the use of the department. Although Cameroon recently launched universal health coverage (UHC) to improve financial access to healthcare, the project is still in its early stages and currently only covers three diseases: malaria, HIV infection, and

tuberculosis. The influx of patients to the emergency department was mainly observed in March, September, and October, which could be due to seasonal factors. March corresponds to the dry season, where temperatures are very high, leading to a resurgence of febrile illnesses during this time of year in the region [16]. September and October correspond to the rainy season, a period when malaria is most prevalent in the region [17]. The age group of children under 2 years old was the most represented (54.35%). These data are similar to those of Mitengi *et al.* [18], Berthier *et al.* [19], and Mabiala [14], who reported 54.6%, 46%, and 55.4%, respectively. In general, studies show that children under 5 years old are the most frequently admitted to pediatric emergency departments [11] [14] [15] [18] [19]. This age group remains the most vulnerable and susceptible to infections due to the immaturity of their immune system and the early complications that can occur at this age. The sex ratio was in favor of males, and our data are similar to those found by Aloe *et al.* [3], Mabiala [14], and Asse *et al.* [20] [21]. The main reasons for consultation were fever (62.22%), convulsions (30.18%), and respiratory difficulties (12%), and our data are similar to those of Mabiala in Congo [14] and Asse *et al.* [21], who reported fever as the main reason for consultation 81.4% and 62% respectively. Other authors also found fever among the reasons for consultation, with 21.6% and 29.2%, respectively [3] [15]. Fever is a common reason for consultation in pediatrics and remains one of the most frequent manifestations of febrile illnesses in tropical regions [21]-[24]. Convulsions may be related to bacterial meningitis as well as malaria in children in our context. In a study conducted in the North Region of Cameroon by Mbono *et al.* [24], convulsions were the third most common severity criteria for malaria after prostration and fever. In our series, severe malaria was the main condition observed (45.18%), and our data corroborate those of other African authors in the DRC [2], Benin [3], Congo-Brazzaville [14], and Côte d'Ivoire [20] [21], who reported severe malaria as the main condition with 87%, 80%, 17.3%, 80%, and 68.4%, respectively. Cameroon is the third most affected country by malaria in Central Africa [25]. The mortality rate was lower than those reported by Alao *et al.* [3] and Asse *et al.* [21], but higher than those of Doumbia *et al.* and Eyi Zang *et al.*, who reported 3.3% and 2.1%, respectively [26] [27]. This low mortality rate does not reflect the reality in the field. The circuit of the sick child is not well codified at MRH, some deaths occur in other department, such as CNTI, general pediatric, outpatient consultations and adult emergencies the one hand, and on the other hand the arrivals of cases who die immediately and those who arrive dead are not always notified. Mortality was higher among children under 2 years old, and our data are similar to those of Ceyi Zang *et al.* [27]. who reported a mortality rate of 51.3% for this age group. The conditions associated with mortality were malaria (41.17%), meningitis (17.64%), and broncho-pulmonary infections (16.17%). Our data corroborate those of many authors who found that the two main conditions associated with death were severe malaria and pneumonia, with the order of frequency varying from one study to another in Africa [3] [4] [14]-[16] [20] [21] [26] [27] and in the literature [28]. Delays in treatment and referral of severe cases contribute to

increased morbidity and mortality from malaria in our context [25] [28] [29]. Most deaths occurred within 24 hours of hospitalization; our data are similar to those of other authors [3] [14] [26]-[31]. This could be explained by the three delays described by Thaddeus and Maine: the first delay in deciding to go to the hospital, the second delay in transferring or referring the patient, and the third delay in accessing quality care in health facilities [32]. In our series, 89% of children were transferred to general pediatrics after stabilization in the pediatric emergency department, reflecting the severity of cases received at the MRH pediatric emergency department requiring appropriate care. Nearly 5% of patients were discharged against medical advice (DAMA), and our data are lower than those found by Doumbia *et al.* [26]. The main reason for DAMA in our context was financial problems, they testify to the efforts that will have to be made by the government to speed up the implementation of the UHC on the one hand, and to include the management of pediatric emergencies in the UHC on the other.

5. Conclusion

Children under 2 years old were the most frequently admitted to the MRH emergency department, and febrile illnesses were the main reason for consultation. Severe malaria, broncho-pulmonary infections, and meningitis were the most common conditions. Most deaths occurred within 24 hours of hospitalization. The mortality was associated with severe malaria; hence there is the need to reinforce malaria prevention measures and recommend the use of malaria vaccine.

6. Recommendations

We suggest the following recommendations:

Pediatric department managers to improve the archiving of records and registers. To raise staff awareness of the importance of notifying deaths in the department's registers in order to obtain reliable data of infant mortality.

MRH administrative managers to define the pediatric emergency circuit in order to avoid delays in the management of pediatric emergencies. To organize training for medical and nursing staff in the management of febrile children, in particular malaria, respiratory infections and meningitis.

To the country's political and administrative authorities, to speed up the implementation of UHC throughout the country, and include the treatment of urgent childhood illnesses. To improve the socio-economic conditions of the population of the far north region.

Researchers to conduct a prospective study of the socio-economic factors that may influence mortality among children admitted to the emergency department of the MRH, in order to provide more reliable data and propose solutions to reduce pediatric morbidity and mortality.

7. Limitation of the Study

Our study is limited by its retrospective nature, with data sometimes missing. The

results of complementary examinations were not available or not carried out, so the diagnosis was essentially clinical for certain conditions.

Author Contributions

All authors contributed to data collection and manuscript writing.

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Conflicts of Interest

The authors declare no conflict of interest.

References

[1] Campbell, J.D., Sow, S.O., Levine, M.M. and Kotloff, K.L. (2004) The Causes of Hospital Admission and Death among Children in Bamako, Mali. *Journal of Tropical Pediatrics*, **50**, 158-163. https://doi.org/10.1093/tropej/50.3.158

[2] Bitwe, R., Dramaix, M. and Hennart, P. (2007) Qualité des soins donnés aux enfants gravement malades dans un hôpital provincial en Afrique Centrale. *Santé Publique*, **19**, 401-411. https://doi.org/10.3917/spub.075.0401

[3] Alao, M.J., Akodjenou, J., Yakoubou, A., Agbodjogbé, Y., Gbénou, A.S. and Zouménou, E. (2020) Pediatric Emergencies: Epidemiological, Clinical, Therapeutic Aspects and Outcome at the Mother and Child Tertiary Hospital-Lagoon (CHU-MEL) of Cotonou-Benin in 2019. *La Revue Africaine d'anesthésiologie et de Médecine d'urgence*, **25**, 53-57.

[4] WHO (2016) Children Mortality. World Health Statistics. Who Press, 136 p.

[5] Demonchy, D., Haas, H., Gillet Vittori, L., Montaudie, I., Piccini-Bailly, C. and Tran, A. (2015) Un circuit court pour désengorger les services d'accueil des urgences pédiatriques. *Archives de Pédiatrie*, **22**, 247-254. https://doi.org/10.1016/j.arcped.2014.12.013

[6] Gillet, J.B. (2004) Les fausses urgences, un vrai problème? *Revista Hospitalidade*, **2**, 24-27.

[7] Nolan, T., Angos, P., Cunha, A.J., Muhe, L., Qazi, S., Simoes, E.A., *et al.* (2001) Quality of Hospital Care for Seriously Ill Children in Less-Developed Countries. *The Lancet*, **357**, 106-110. https://doi.org/10.1016/s0140-6736(00)03542-x

[8] Robison, J.A., Ahmad, Z.P., Nosek, C.A., Durand, C., Namathanga, A., Milazi, R., *et al.* (2012) Decreased Pediatric Hospital Mortality after an Intervention to Improve Emergency Care in Lilongwe, Malawi. *Pediatrics*, **130**, e676-e682. https://doi.org/10.1542/peds.2012-0026

[9] Molyneux, E. (2006) Improving Triage and Emergency Care for Children Reduces Inpatient Mortality in a Resource-Constrained Setting. *Bulletin of the World Health Organization*, **2006**, 314-319. https://doi.org/10.2471/blt.04.019505

[10] Cameroon: Mortality by Age and Sex/Fr-Cameroun NHO. http://onsp.minsante.cm

[11] Uyo Yenwong-Fai. Note d'analyse. issafrica. https://s3.amazonaws.com

[12] SurveyMonkey (2024) Sample Size Calculator. https://fr.surveymonkey.com/mp/sample-size-calculator/

[13] La prise en charge du paludisme grave-guide pratique. Troisième édition nd. https://apps.who.int/iris/handle/10665/87012

[14] Mabiala-Babela, J.R. and Senga, P. (2009) Consultation de nuit aux urgences pédiatriques du CHU de Brazzaville, Congo. *Medecine Tropicale*, **69**, 281-285.

[15] Laaraje, A., Mekaoui, N., Karboubi, L. and Dakhama Badr Sououd, B. (2018) Consultations aux urgences médicales pédiatriques: Qui, pourquoi et comment? À propos de 1000 consultants. Service des urgences médicales pédiatriques, hôpital d'enfants Rabat. *Revue d'Épidémiologie et de Santé Publique*, **66**, S157. https://doi.org/10.1016/j.respe.2018.03.102

[16] Kenfack, T.T., Tsalefac, M. and Haidu, I. (2009) Influence du climat sur les épidémies de méningites à méningocoque dans la plaine du Diamaré (Extreme-Nord, Cameroun). Géographia Technica. Numéro spécial.

[17] Roungou, J.B., Dia, M., Ndemeffo, J., Tougordi, A., Batalack, S. and Etoa, B. (2016) La chimio prévention du paludisme saisonnier (CPS) au Cameroun. *Relevé épidémiologique mensuel du Cameroun*, **16**, 1-10.

[18] Mintegi Raso, S., Benito Fernández, J., García González, S., Corrales Fernández, A., Bartolomé Albistegui, M. and Trebolazabala Quirante, N. (2004) Demanda y asistencia en un servicio de urgencias hospitalario. *Anales de Pediatría*, **61**, 156-161. https://doi.org/10.1157/13064595

[19] Berthier, M. and Martin-Robin, C. (2003) Les consultations aux urgences pediatriques étude des caractéristiques sociales, économiques et familiales de 746 enfants. *Archives de Pédiatrie*, **10**, s61-s63. https://doi.org/10.1016/s0929-693x(03)90382-4

[20] Asse, K.V, Plo, K.J. and Yenan, J.P. (2011) Mortalité pédiatrique en 2007 et 2008 à l'Hôpital Général d'Abobo (Abidjan/Côte d'Ivoire). *La Revue Africaine d'anesthésiologie et de Médecine d'urgence*, **16**, 30-36.

[21] Asse, K.V., Plo, K.J., Yao, K.C., Konaté, I. and Yenan, J.P. (2012) Epidemiology, Diagnostics, Therapeutic and Outcome Profile of Patients Referred to Pediatric Emergency Ward at the University Hospital Teaching of Bouake (Cote d'Ivoire). *La Revue Africaine d'anesthésiologie et de Médecine d'urgence*, **17**, 81-87.

[22] Kaloussi, I. (Issa) Etiologie de la fièvre du nourrisson et du jeune enfant en milieu tropical: Cas d'un centre de santé au Mali. *Environmental and Water Sciences*, *Public Health and Territorial Intelligence Journal*, 7, No. 4.

[23] Soman, M. (1982) Diagnosis Workup of Febrile Children under 24 Months of Age: A Clinical Review. *The Western Journal of Medicin*, **37**, 1-12.

[24] Mbono, R., Eposse, C., Kamo, H., Mekone, I., Eppée, J. and Sap, S. (2023) Aspects thérapeutiques et évolutifs du paludisme grave de l'enfant dans trois hôpitaux de référence au Cameroun. *Health Sciences and Disease*, **24**, No. 12.

[25] Cameroon. Sev Malar Obs (n.d.). https://www.severemalaria.org/fr/pays/Cameroun

[26] Doumbia, A.K., Togo, B., Togo, P., Traoré, F., *et al.* (2016) Morbidity and Mortality in Children 1 to 59 Months in Hospital Service of General Pediatrics CHU Gabriel Toure from January to December 2013. *Malienne d'infectiologie et de microbiologie*, **8**, 54-62.

[27] Zang Eyi, C., Nze Obiang, P.C., Mve Abaga, R., Moussa, O., Eyang Nkiet, S., *et al.* (2022) Analysis of the Mortality at the Pediatric Emergency Unit of the Jeanne Ebori Foundation Mothers and Children Hospital, Libreville, Gabon. *Rev Anesth-Réanim Med Urg Toxicol*, **14**, 17-21.

[28] Children: Improving Survival and Well-Being. https://www.who.int/fr/news-room/fact-sheets/children-reducing-mortality

[29] Ministère de la santé publique (2019) Guide de prise en charge du paludisme au

Cameroun à l'usage du personnel de santé. Ministère de la Santé Publique.

[30] Errahoui, A. (2018) Mortalité aux urgences pédiatriques du CHU Mohammed VI Marrakech. Thèse de Médecine, Faculté de Médecine et de Pharmacie de Marrakech.

[31] Balenga Luboya, A., N'sinabau Eyay, R., Magoga Kumbudu, M., Ndongosi Muntu, F. and Kompany Mukuna, P. (2020) Mortalité Infantile aux Urgences Pédiatriques de l'Hôpital Général de Référence de N'djili/ISTM, Kinshasa. *Congo Sciences*, **8**, 173-176.

[32] Thaddeus, S. and Maine, D. (1994) Too Far to Walk: Maternal Mortality in Context. Social *Science & Medicine*, **38**, 1091-1110. https://doi.org/10.1016/0277-9536(94)90226-7