

Medication Utilization and Illness Management Study in Nigeria

Ehijie FO Enato, Adebukola A Sounyo, and Thomas R Einarson

Illness is common in poor countries, including Nigeria. Oshikoya et al.¹ reported a 54% rate of illness in the previous month as indicated by a survey of 1110 mothers of school children. Serious diseases such as malaria are prevalent in up to 60% of families in some areas of the country.² Consequently, Nigeria has high rates of mortality compared with those in developed countries. Whereas Nigeria has an overall crude mortality rate of 16.6/1000 and an infant mortality rate of 94.4/1000, Europe has respective rates of <11/1000 and 5/1000.^{3,4} Life expectancy is about 48 years (as opposed to a world average of 67.2), which is among the lowest in the world, ranking 182nd out of 194 countries.⁵

It is common among people of all social strata in Nigeria to treat illnesses with drugs.^{1,6-8} Odebiyi and Femi-Oye-wo⁹ found a surprisingly high (82%) rate of use of nonprescribed prescription drugs among university students. Patterns of medication use have been found to vary between urban and rural regions,¹⁰ which is possibly related to poor living conditions, disparity, and poverty.^{11,12} These problems are of great concern in a country in which 70% of the

BACKGROUND: Little is known about rates of illness, illness management, or drug utilization in developing countries.

OBJECTIVE: To determine patterns of illness and drug utilization in urban and rural households in Nigeria.

METHODS: A survey was developed and validated for data collection. A random sample from some communities in Owan East Local Government Area (LGA) of Edo State, Nigeria, was selected, based on a national population survey, using both the supervisory and enumeration areas of the LGA. We determined the sample size using methods described by Cochran, including 5% precision, 5% α , and allowing for 5% data error. Respondents were queried in face-to-face interviews about illnesses in their households during the previous 2 weeks; demographic information; how they were treated; and where they sought treatment, advice, and medicines. As well, we determined how they kept families well. Descriptive statistics were used to summarize data.

RESULTS: Out of 549 persons, 497 completed the questionnaires, giving a response rate of 90.5%. Of these respondents, 395 (79.5%) reported 517 illnesses during the previous 2 weeks. The average age of the ill person was 30.6 \pm 24.3 years (range 3 months to 95 years). Percentages by age were: infants younger than 1 year 1.0%, children aged 1-17 years 36.0%, and adults aged \geq 18 years 63.0%. Average monthly income per household was low (13,247 naira/88.31 US\$). Malaria and its symptoms (fever, chills, joint pain, headache, gastrointestinal problems) and upper respiratory symptoms were most common. A majority (44.8%) of the ill persons self-treated, with 93.6% using antibiotic and antimalarial drugs. Among the households surveyed, 42.1% had drugs on hand (average 2.3 \pm 1.3, range 1-7, median 2) for disease prevention, and the most used drugs were analgesics (46.2%) and antimalarial drugs (37.3%).

CONCLUSIONS: Illness is frequent in Nigeria and is usually self-treated with antibiotic and antimalarial drugs. Medications were reported to be the most frequently used measure to prevent household illness. The implications of these findings are discussed.

KEY WORDS: drug utilization, illness, medicine use, Nigeria, treatment.

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population lives below the poverty line¹³ and farmers subsist on an annual salary of \$215 US\$.¹⁴

One aspect of health care that has attracted attention is self-medication using antibiotics,¹⁵⁻¹⁷ which is often done inappropriately. The problem is compounded by reports that many of these antibiotics have been found to be counterfeit¹⁸ and others have been substandard¹⁹⁻²² and/or contaminated.^{21,22} Contamination has also been found with other types of medications in Nigeria,^{23,24} including herbal medicines.²⁵ Taylor et al.²² suggested that substandard quality of antibiotics could be a contributing factor to development of disease resistance. As well, such problems can influence illness management and drug-related behavior.

Nonetheless, medicines are pivotal to effective health-care delivery and disease prevention. Availability and affordability of good quality drugs coupled with their rational use is fundamental to an effective health-care delivery system in any country. However, other factors, including access, affordability, and knowledge, influence appropriate use of medications.²⁶⁻²⁸

In Nigeria, it is widely believed among health professionals and the lay public that irrational drug use is abundant; however, systematic studies to quantify the extent of this behavior are limited. However, medicines are indispensable components of any health-care system, and their availability and judicious use are critical components of the quality of health care that consumers receive. This study was, therefore, undertaken in selected urban and rural communities in Edo State, Nigeria, to investigate (1) patterns of current illness and its management; (2) medication utilization, both for the current illness and on a day-to-day basis; and (3) associated factors, such as self-care activities by respondents in the face of the current global economic recession. We envisage that the world economic crisis may have had a more dramatic negative impact on families and households in terms of access to and quality of the health care that they receive.

Methods

STUDY LOCATION

The study was carried out in different communities within Owan East Local Government Area (LGA) of Edo State, Nigeria, with its headquarters in Afuze. Edo State is located in the south-south geopolitical region of the country, about 500 km south from Abuja, the capital city of Nigeria. The Nigerian demographic and health survey of 2008 indicates that a majority of people in the region have at least secondary or primary education.²⁹ Administratively, the country is divided into Federal, State, and Local Government Areas (LGAs). There are 3 levels of health-care in the country's system: primary, secondary, and tertiary. At the primary level, patients have their first contact with the health-care system and receive basic health-care services.

Secondary health care provides specialized outpatient and inpatient services to patients referred from the primary health care level. Finally, tertiary health care consists of specialized services provided by the teaching hospitals and other specialized hospitals within the country. The population of Edo State, based on 2006 nationwide census figures, is placed at slightly more than 3 million, while that of the Owan East LGA is slightly more than 150,000.³⁰

DATA COLLECTION AND INSTRUMENT

Data collection focused on 3 major themes (recent illnesses and their management; medication utilization patterns; and factors related to decisions, beliefs, and behaviors with regard to illnesses and medications). A household questionnaire was used to collect required data. Items on the questionnaire were developed by the research team after extensive review of the relevant literature (including World Health Organization guidelines),³¹ personal professional experiences of the investigators, and preliminary in-depth interviews with some stakeholders in the communities, including health professionals, administrators at the LGA, and some community members. Subsequently, a face validation was done by a panel of multidisciplinary experts and peers, including the research investigators and some other senior academics at the University of Benin, Nigeria. Determining reliability of the questionnaire was undertaken through a pilot test on a sample of respondents drawn from Igarra community, which is located in Akoko-Edo LGA and has similar socioeconomic and educational characteristics. The investigators then modified the questionnaire where necessary until an acceptable version was obtained; acceptability was based on ease of use/comprehension, logic, and cultural acceptability. The final version consisted of 2 sections, 1 of which collected information on respondents' identification/sociodemographic characteristics, and the other inquired about recent household illness/drug utilization. The study was approved by the ethical review committee of the University of Benin Teaching Hospital, Benin City, Nigeria. Prior to the survey, administrative approvals were obtained from the authority of the LGA and the local community heads. All respondents voluntarily participated in the survey after the nature of the study had been explained to them.

DATA COLLECTION

The study was conducted between November and December, 2009. The data were collected using a multistage sampling approach. The study locality (Owan East LGA) was first stratified into urban and rural residences, based on existing criteria of the Nigerian national population commission. Thereafter, 3 clusters (1 urban [Afuze] and 2 rural [Erah and Ikao]) were randomly selected using supervisory

areas from the 2006 National Housing and Population Census.³⁰ The enumeration areas (EAs) within each cluster were noted and a sample of EAs from the 3 clusters was drawn for the study. Prior to the survey, household listing teams visited the selected study areas and prepared up-to-date maps of the EAs, indicating locations of structures, listing households, and recording all members of the households, beginning with the head. The heads of households (or any other competent respondents) from the selected EAs were surveyed on the research questions, using the developed questionnaire, and where necessary, additional clarifications were sought from other household members present at the time of the interview. When a potential respondent was not available, the interviewer noted it on the data collection form and moved on to the next eligible household. If respondents were not home at the initial visit, the interviewer made repeat visits at different times until an eligible respondent was available to answer the research questions. However, when a potential respondent could not be interviewed, either because she was not at home during repeated visits by the research team or she refused to be interviewed, such person was classified as a nonrespondent. This exercise was continued until the required number of respondents was obtained. To reduce recall bias, respondents were asked what illness or illnesses they or a member of their household had during the previous 2 weeks, the nature of the illness, and what medications were used. We did not attempt to assess at what point the respondent or household member was in the course of treatment/recovery of the mentioned illness during the survey. Before commencing the study, we recruited 4 survey assistants from the communities and trained them on the general nature of the study, how to locate the households, and how to administer the research questionnaire.

SAMPLE SIZE

We employed a population-based approach to calculate the required sample size, as described by Cochran.³² Using 5% precision and 5% α error protection, we required a primary sample size of 385 interviewees. However, since we wanted to study both urban and rural populations, we included an additional 97 participants to ensure that there would be at least 10% precision in any subpopulation. Allowing for 5% data problems, our target sample size was approximately 500. We did not specifically intend to compare urban and rural areas in the sample size calculation.

DATA ANALYSIS

Data from the questionnaire were entered into an Excel (Microsoft Corp., Redmond, WA) spreadsheet and sorted according to the research objectives. Thereafter, data were analyzed using standard descriptive statistics such as mean (SD), median, minimum, and maximum.

Results

Data were obtained from 497 of the 549 persons contacted for the survey, giving a response rate of 90.5%. Of the 497 respondents, 38.2% (190/497) were from Afuze, an urban community, and 61.8% were from the 2 rural communities. Nonrespondents did not differ significantly from respondents in terms of sociodemographic characteristics. The average (SD) monthly household income of the 445 persons who answered that question was 13,247 (11,233) naira, which is approximately \$88.31 US (\$1 US = 150 naira). It ranged from 500 to 85,000 naira, with a median of 10,000 (\$66.67 US). In terms of urban and rural areas, the average (SD) monthly household incomes in Nigerian naira were 18,030 (12,677) and 9707 (8563), respectively. A majority of respondents in the LGA had attained secondary or primary education, although the number of persons with no formal education was greater in rural than in urban communities.

With respect to illnesses, 395 respondents (79.5%) reported 517 cases of illness for themselves or a member of their household during the previous 2-week recall period. Three respondents did not specify type of ailment; among the 392 who did, 73.0% indicated that there was 1 ailment, 22.2% reported 2 ailments, and 4.8% reported 3 ailments for the ill person during the recall period. The average was 1.32 per household (median = 1). Table 1 summarizes the reported illnesses, according to the World Health Organization classification system. Fever and related illness was most (57.6%) frequently reported by the respondents. The average age of the ill person was 30.6 ± 24.3 years (range 3 months to 95 years; median 26.0 years) among the 392 respondents who reported age. There were 4 (1.0%) infants younger than 1 year, 141 (36.0%) children aged 1-17, and 247 (63.0%) adults 18 and older. Table 2 indicates where people went for treatment and the forms of drug administration used. A majority (44.8%) self-treated, while only 31.4% reported going to a health-care facility (general/private hospital, primary health center) for treatment.

Drug treatments for the recent illnesses are summarized in Table 3. Antimalarial drugs were by far the most used (90.3%). The dosage forms of the drugs used appear in Table 4, and respondents reported using mainly oral dosage forms (tablets and capsules [350/575, 60.9%]). There were 118 (20.5%) reported cases of injection use, 9 (7.6%) of which were by self-medicators, while the remainder (109, 92.4%) were received from other sources (Table 2).

When participants were asked whether their symptoms were relieved after they received drug treatment, from whatever source, 396 persons responded. Of this number, 380 (96.0%) indicated that the drug relieved their conditions and another 6 (1.5%) indicated feeling "slightly relieved," for a total success rate of 97.5%. There was 1 individual (0.3%) who reported no effect and 9 (2.3%) who

stated that the condition worsened. The median cost for the drugs was 500 naira (USD \$3.33).

In addition, when we asked whether participants had received any advice on where to go for treatment of their illnesses, and if so, who gave the advice, 179 respondents said that they had been advised. Most (62.0%) advice was obtained from family members or neighbors/friends (37.4%), with one person (0.6%) indicating that advice was sought from a clinic. Fifty-four (30.3%) advice seekers and 122 (56.7%) nonseekers of advice self-medicated ($\chi^2 = 27.46$, $p < 0.001$). When responses from those who had self-medicated and those who had visited patent medicine shops for treatment were added, we found that the rates increased to 63 (35.4%) for advice seekers and 137 (63.7%) for nonseekers ($\chi^2 = 31.27$, $p < 0.001$).

Medications (49.6%) and herbal medicines (25.2%) were mentioned by participants as the most frequently used measures to prevent illness in themselves and their families; 13.1% said clean environment or water, 7.2% cited good food, and 1.8% mentioned exercise, avoidance of

sunlight, drinking boiled water, and proper hygiene as illness preventive measures. Two hundred nine (42.1%) persons answered that they had an average of 2.3 (1.3) drugs on hand to keep their families free of illness, with a range of 1-7 (median 2 per household). Most households used 1 (26.8%), 2 (38.3%), or 3 (23.0%) of these drugs. The types of medicines kept on hand to keep families free from disease are summarized in Table 5. The majority were analgesics (46.2%) and antimalarials (37.3%).

Discussion

The study achieved a high response rate of 90.5%, which can be explained by the "malaria awareness campaign" that was ongoing at the community at the time of the study. The respondents considering this study as part of the awareness campaign expressed their full support to the research team. The campaign had mobilized the entire community and all stakeholders in the prevention of malaria in pregnancy and young children.

Table 1. Reported Illnesses and Symptoms Categorized According to the ATC Classification System of the World Health Organization

Category	System	Target Condition (n)	Subtotal	% of Total
A	Alimentary	No appetite (25), stomach pain (14), diarrhea (6), ulcer (4), bitter mouth (2), piles (1)	52	10.1
C	Cardiovascular	Hypertension (5), chest pain (1)	6	1.2
D	Dermatological	Rash (2), boil (2)	4	0.8
N	Nervous system	Fever (211), headache (32), chills (1), body pain (25), pain (19), waist pain (6), toothache (1), convulsion (3)	298	57.6
J	Infections	Malaria (42), typhoid (6), cholera (2)	50	9.7
M	Musculoskeletal	Rheumatism (11), body weakness (6), joint pain (11)	28	5.4
R	Respiratory	Cold (42), catarrh (16), cough (18)	76	14.7
S	Sensory organs	Eye problem (3)	3	0.6
TOTAL			517	100

ATC = Anatomical Therapeutic Chemical.

Table 2. Treatment Source for Recent Illnesses

Treatment Source	Patients, n (%)	Injection Used, % (n = 118)	Other Forms of Administration, % ^a (n = 457)
General hospital	34 (8.7)	15.3	7.7
Private hospital	34 (8.7)	20.3	19.7
Primary health center	55 (14.0)	23.7	8.1
Traditional herbal home	5 (1.3)	0.0	15.5
Maternity home	63 (16.0)	28.8	6.8
Treated at home by nurse	2 (0.5)	0.8	40.9
Patent medicine store	24 (6.1)	3.4	1.1
Self-treatment	176 (44.8)	7.6	0.2
TOTAL	393 (100)	100	100

^aOther forms include tablet, capsule, suspension/liquid, infusion, and herbal preparations.

Table 3. Medications Used for Treating Reported Illnesses

ATC Category	Drug Type	n (%)
A	Antidiarrheal	5 (1.9)
A	Worm expeller	1 (0.4)
J	Antimalarial	241 (90.3)
J	Antibiotic	9 (3.4)
N	Analgesic	7 (2.6)
N	Antipyretic	1 (0.4)
N	Anticonvulsant	1 (0.4)
R	Antihistamine	1 (0.4)
NA	Surgical operation	1 (0.4)
TOTAL		267 (100)

ATC = Anatomical Therapeutic Chemical; NA = not applicable.

The respondents reported a high (80%) rate of household illness, a finding that is similar to reports from other studies^{1,33} in different parts of the country. Of these illness episodes, malaria-related symptoms were most prevalent, an indication that the disease remains a major public health problem in the country,² despite national and international efforts at malaria control. However, a majority of the illness episodes were treated outside the formal health sector. Indeed, self-treatment was most frequently undertaken by the respondents, and this finding is consistent with previous reports in different parts of the country.^{9,15-17} Furthermore, among those who said that they had used health facilities for treatment of their illnesses, there is the possibility of prior self-medication before visiting the health facility, though this could not be ascertained from the data available to us in this study. Obaseiki-Ebor et al., in a survey of self-medication practice in Benin City, Nigeria, found that all 500 respondents randomly selected from the general public had used antibiotics before consulting a health-care professional.¹⁶ Of major concern is the quality of these self-initiated treatments and the possibility of overtreatment with anti-infective agents. Inappropriate use of antibiotics is noted to result in selective drug pressure, with resultant development and spread of resistant species

of the infective pathogens.^{16,33} Furthermore, such practice leads to waste of scarce resources in a community with a high poverty level. Indeed, the World Bank has defined poverty as an income of less than \$1.25 per day, which amounts to \$456.25 per year.³⁴ Furthermore, the finding that a majority of respondents initiated self-medication with drugs that they bought from a patent medicine vendor is not surprising. Uguru et al.¹² reported that the most poor among the population used drug vendors for the treatment of their ailments, while the least poor went to hospitals. The same patterns were reported in similar studies by Afolabi²⁶ and Amaghionyeodiwe.²⁷ The average monthly income of the household was reported to be \$88.31 (\$1059.72/year), which is far below the World Bank average value.

Oral dosage forms were most frequently used by the respondents, followed by injections. A further evaluation indicated that a majority of people who used injections sought treatment from health facilities. This finding corroborates results obtained from a recent study on drug use from 2 primary care facilities in the locality. In addition, the fact that 9 respondents who self-medicated said that they had used injections is worrisome and calls for greater attention in the community. It is noteworthy that there were several reported cases of administration by injection via the oral route by members of the public in this country in the mid 80s to the early 90s, many of which resulted in fatalities. Injection overuse should be discouraged, and measures to achieve this, such as educational interventions, are recommended. Injection administration carries potentially fatal risk,³⁵ especially under conditions such as those prevalent in many developing countries, where safety guarantees are lacking. Also, use of injections carries potential risk of spread of blood-borne pathogens, including HIV/AIDS and hepatitis.^{35,36} In addition, the cost of injection accessories and the manpower to administer injections adds to the financial burden of already overburdened patients.

Respondents indicated that medicine is their most frequently used measure to prevent illness, and analgesic and antimalarial drugs were mostly used. These findings are similar to those of a previous study by Enato et al.³³ in Jesse clan of Delta State, Nigeria, where respondents kept medicines that they thought were most important to them in maintaining health and preventing their most frequently reported illnesses. Malaria symptoms were reported to be the most frequent illness experienced by the respondents (Table 1).

Our study identified malaria-related symptoms as the most prevalent ailment reported by survey respondents. Consequently, antimalarial drugs comprised over 90% of the medications used by that population. A majority of respondents self-treated their illnesses, and medications were reported to be the most frequently used measures to prevent illness. Although a majority of the medications were administered orally, the high rate of injection use deserves further attention.

Table 4. Drug Form Used to Treat Recent Illnesses

Drug Form	n (%)
Tablet	293 (51.0)
Capsule	57 (9.9)
Infusion	6 (1.0)
Injection	118 (20.5)
Herbal mixture	28 (4.9)
Oral rehydration salt	1 (0.2)
Suspension	71 (12.3)
Syrup	1 (0.2)
TOTAL	575 (100)

Table 5. Drugs Used Preventively by Families

ATC Code ^a	ATC Class	n (%)
N	Analgesics/antiarthritics	140 (46.2)
J	Antimalarials	113 (37.3)
J	Antibiotics	2 (0.7)
A	Vitamins	29 (9.6)
B	Iron/hemetics	17 (5.6)
C	Cardiovascular drugs	1 (0.3)
	Unknown	1 (0.3)
TOTAL		303 (100)

ATC = Anatomical Therapeutic Chemical.
^aATC classification system of the World Health Organization.

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Un Estudio Sobre la Utilización de Medicamentos y el Manejo de Enfermedades en Nigeria

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EXTRACTO

TRASFONDO: Se sabe poco sobre las tasas de enfermedades y su tratamiento o sobre la utilización de fármacos en países en vías de desarrollo.

OBJETIVOS: Determinar patrones de enfermedades y de utilización de fármacos en hogares urbanos y rurales en Nigeria.

MÉTODOS: Se desarrolló y validó una encuesta para la recopilación de datos. Una muestra aleatoria de algunas comunidades en el Área del Gobierno Local Owan-East del estado de Edo, Nigeria (LGA por sus siglas en inglés) fue seleccionada en base a una encuesta de la población nacional, usando ambas áreas, la de supervisión y la de enumeración del LGA. El tamaño de la muestra se determinó utilizando los métodos descritos por Cochran, incluyendo un 5% de precisión, un 5% de alfa y permitiendo un 5% de error de los datos. Las personas respondieron a preguntas sobre enfermedades en su hogar durante las dos semanas anteriores, sobre información demográfica, sobre cómo fueron tratados y sobre dónde buscaron tratamiento, consultas y medicamentos a través de una entrevista cara a cara. También, los autores determinaron cómo las personas que respondieron mantuvieron bien a las familias. Los datos fueron resumidos usando estadísticas descriptivas.

RESULTADOS: De 549 personas, 497 completaron los cuestionarios dando un porcentaje de respuesta de 90.5%. De este número, 395 (79.5%) reportaron 517 enfermedades durante las 2 semanas anteriores. La edad promedio de la persona enferma fue de 30.6 ± 24.3 años (un rango de 3 meses a 95 años); 1.0% de niños menores de 1 año, 36.0% de niños entre las edades de 1-17 años y 63% de adultos ≥ 18 años. El ingreso promedio/hogar fue bajo (13,247 naira/\$88.31 USD). La malaria y sus síntomas —fiebre, escalofríos, dolor en las articulaciones, dolor de cabeza, problemas gastrointestinales— y síntomas de las vías respiratorias superiores fueron las más comunes. Una mayoría de las persona enfermas (44.8%) se auto-trató, con un 93.6% usando antibióticos/fármacos contra la malaria. Entre los hogares entrevistados, 42.1% tenían los medicamentos a mano para la prevención de enfermedades (promedio = 2.3 ± 1.3 , rango = 1-7, mediana = 2) y los medicamentos más utilizados fueron los analgésicos (46.2%) y los fármacos contra la malaria (37.3%).

CONCLUSIONES: La enfermedad es frecuente, usualmente auto-tratada con antibióticos/fármacos contra la malaria. Los medicamentos fueron reportados como la medida usada más frecuentemente para la prevención de enfermedades en el hogar. Los autores discuten las implicaciones de estos hallazgos.

Traducido por Brenda R Morand

Étude sur l'Utilisation des Médicaments et la Gestion des Maladies au Nigéria

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RÉSUMÉ

OBJECTIF: Déterminer les tendances au niveau des maladies et l'utilisation des médicaments chez une population rurale et urbaine du Nigéria.

MÉTHODES: Un questionnaire a été développé et validé pour la collecte des données. Un échantillon des quelques communautés de la zone d'administration locale Owan-East de l'État Edo du Nigéria a été sélectionné au hasard selon une étude nationale populationnelle en utilisant le district de recensement de la zone d'administration locale. La taille de l'échantillon a été déterminée en utilisant les méthodes décrites par Cochran avec une valeur de précision de 5%, une valeur alpha de 5% avec une source d'erreur de 5%. Les répondants ont été questionnés en utilisant une entrevue face à face sur des thèmes en lien avec les maladies survenant dans leurs foyers durant les 2 semaines précédant l'étude, les informations démographiques, comment ils se sont soignés et à quel endroit ils ont demandé de l'aide pour les traitements, les informations et les médicaments. Des statistiques descriptives ont été utilisées pour analyser les données.

RÉSULTATS: Un nombre de 497 des 549 personnes ont complété le questionnaire avec un taux de réponse de 90.5%. De ce nombre, 395 (79.5%) ont rapporté 517 problèmes de santé durant les 2 semaines précédant l'étude. L'âge moyen des personnes malades était de 30.6 ± 24.3 ans (écart 3 mois à 95 ans); 1.0% étaient des nourrissons de moins de 1 an; 36.0% des enfants de 1-17 et 63.0% des adultes de plus de ≥ 18 ans. Le salaire moyen mensuel par ménage était de (13.247 naira/USD \$88.31). La malaria et ses symptômes (température, frissons, douleurs aux articulations, maux de tête, problèmes gastro-intestinaux) et les problèmes des voies respiratoires supérieures étaient les plus fréquents. La majorité (44.8%) des personnes ont utilisé de l'automédication avec 93,6% des répondants qui ont utilisé des antibiotiques ou des antipaludéens. Dans les foyers, 42.1% des répondants avaient des médicaments à la maison (moyenne = 2.3 ± 1.3 , écart = 1-7, médian = 2) pour la prévention de la maladie et la majorité des médicaments utilisés était des analgésiques (46.2%) et des antipaludéens (37.3%).

CONCLUSIONS: La maladie est fréquente chez cette population et est souvent traitée avec de l'automédication soit des antibiotiques et des antipaludéens. Les médicaments représentaient les mesures les plus souvent utilisées pour prévenir les différentes maladies.

Traduit par Louise Mallet