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## Burden of headache in Africa

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**Abstract** Information on the prevalence and health burden of headache in Africa is scanty. Earlier studies in the 1970s suggested that migraine was a rare condition in the African. This may have been due to an under-diagnosis because in less educated and rural African communities headache is considered a relatively trivial condition compared to other more basic and demanding socio-economic problems. More recent community-based studies put the prevalence rates of migraine between 3%–6.9%. The one-year prevalence of chronic tension-type headache in one African study was 1.7%. A review of the published literature reveal that cluster headache is extremely rare in the African. The clinical features of migraine in the African are similar to

those described among Caucasians. However classical migraine appears to be rare in the African. Hot climate particularly exposure to the sun and physical and emotional stress were found to be the most common trigger factor for migraine attacks. Few African migraineurs use specific medications. The majority opt for traditional and herbal therapies. It is to be emphasized that there is a big need to undertake well planned epidemiological studies on headache in African populations using the International Headache Society Criteria with particular emphasis on health facility utilization and sickness absence from work.

**Key words** Africa • Headache • Migraine • Prevalence • Health burden

The literature on the prevalence and health burden of headache in Africa is scanty. In addition to the limited published materials one has to rely on the personal experience of prominent neurologists to get a broad picture of the magnitude of the problem on the continent. This review focuses on sub-Saharan Africa for the simple reason that the countries south of the Sahara have more or less similar socio-demographic characteristics which provides possibilities to make comparisons and some guarded conclusions.

In as far as the global picture of headache is considered, there are similarities and differences between the situation in the North (i.e. Europe and North America) and the tropical South. Headache in Africa is common, although less frequent

than in the North. It exhibits similar clinical manifestations. However, sub-Saharan Africa has its own particularities. Because of the low life expectancy in African countries, in prevalence studies one deals with relatively young populations. Environmentally, there is the role of the tropical hot climate and the high prevalence of infectious diseases. It is our observable experience that in the African culture pain is tolerated more than in the West. On top of this, diseases are perceived in the magico-religious context where traditional healing plays a big role. Socioeconomically, low incomes, poor infrastructures and inadequate healthcare coverage make the disease burden of headache different from that in the rich and developed North.

It is to be noted that headache due to organic pathologies is a common occurrence in Africa. There are the localized ear, nose and throat (ENT) and ophthalmic pathologies. Meningitis and encephalitis from different etiologies are commonly encountered. What are even more prevalent are the systemic diseases primarily of infectious origin such as malaria, relapsing fever, typhus, typhoid, pneumonia and tuberculosis where headache may be the chief complaint. These etiologies are extremely uncommon in the West and are rarely brought into the differential diagnosis of severe headache. Undiagnosed hypertension is fairly common in Africa and contributes to the causation of chronic headaches.

These particularities have their direct and indirect consequences on headache as a medical problem. In most African countries there are often delays in seeking medical care and in the diagnosis of organic causes of headache. As a result, headache is often unrecognized and underdiagnosed. Its frequency is therefore not yet accurately determined.

If one focuses on migraine in particular, again, the literature regarding Africa is limited. In Spillane's 1973 *Textbook of Tropical Neurology*, neurologists shared their rich experiences on the prevalence of migraine based on hospital population studies (Fig. 1). Authors in the book did not mention migraine as a problem in Senegal [1] and Uganda [2]. It was reported to be unduly rare in Zimbabwe [3, 4] and South Africa [5]. The neurologists in both Zimbabwe and South Africa specifically remarked on the extreme rarity of the condition. They claimed to have seen only one or two cases of migraine per year. However, Osuntokun in Nigeria [6], Harris in Kenya [7] and Haddock in Ghana [8] recognized its existence with prevalences of 3%, 3.5% and 6.3%, respectively, in hospital populations.

Subsequent to these collected experiences published in Spillane's 1973 book, hardly anything appeared in the litera-

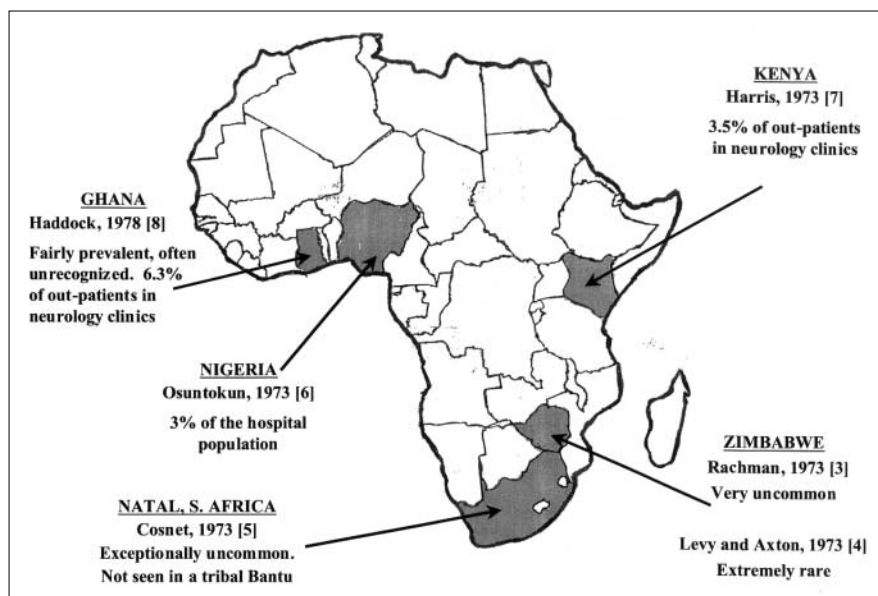
ture on migraine in Africa until the early 1980s. Hospital-based studies in primary care and neurology referral clinics (Fig. 2) produced prevalence rates that ranged from 4.5% to 42.4% [9–14]. Prevalence studies carried out among students and urban workers yielded the very high rates of 16.7%–33.8% [9, 10, 12, 14]. The different study populations and survey methodologies employed in these studies do not lend to comparisons and conclusions on the true prevalence of migraine in Africa. However, all the studies confirm that migraine is not after all a very rare entity in the African.

The epidemiological surveys in Nigeria [15–17], Ethiopia [18], Tanzania [19, 20] and Zimbabwe [21] produced prevalence rates of 3%–6.9% among adults. One of the two surveys from Tanzania [19], which was carried out among urban workers and university students, yielded a very high prevalence of 30.8%. Two Nigerian studies put the prevalence of migraine among children at 5.7% and 6.8% [22, 23] (Fig. 3).

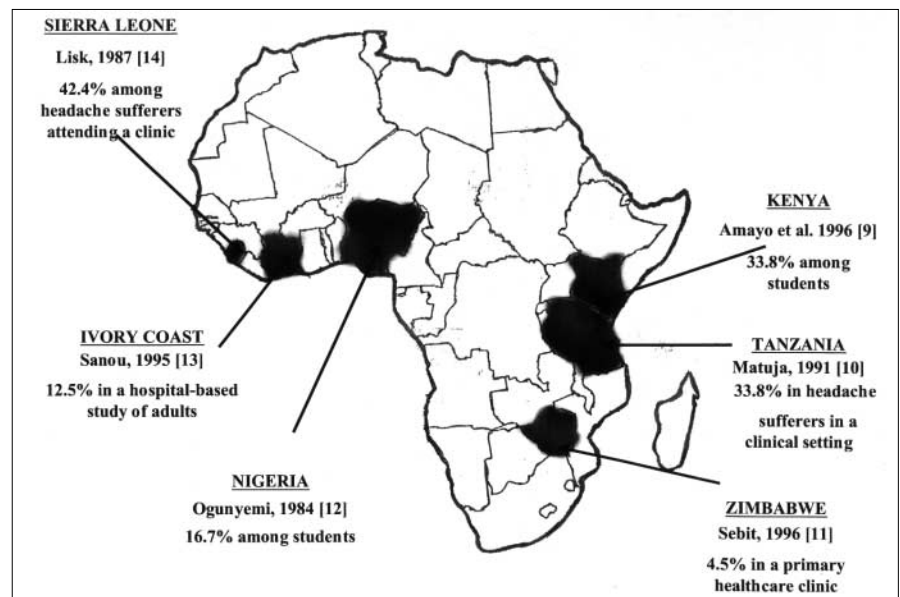
The clinical features of migraine in the African as described in all these studies are similar to those described among Caucasians. An obvious female preponderance of 1:1.3 to 1:2.8 was documented in all the studies (Table 1).

**Table 1** Male-female ratio for migraine sufferers in African studies

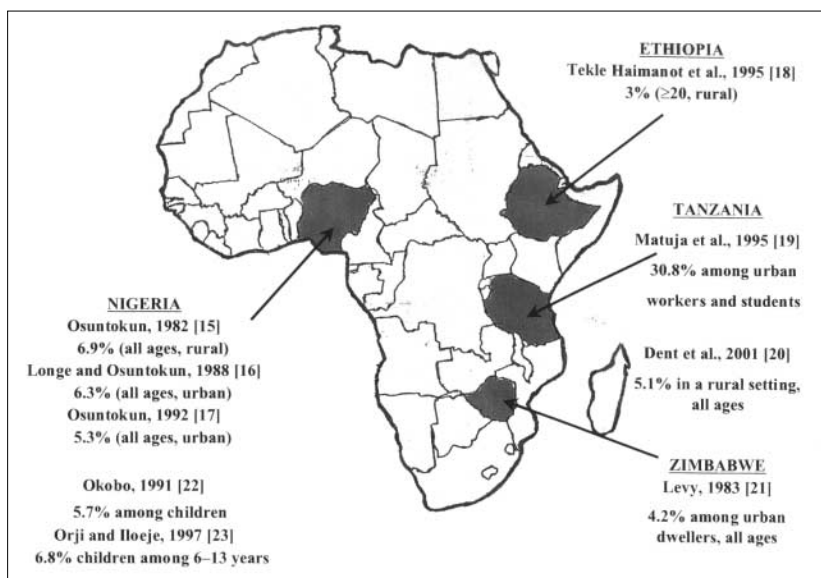
Country	Reference	M:F
Nigeria	Osuntokun et al., 1982 [15]	1:2
Nigeria	Ogunyemi, 1984 [12]	1:1.4
Nigeria	Longe et al., 1988 [16]	1:1.2
Kenya	Amayo et al., 1996 [9]	1:1.3
Ethiopia	Tekle Haimanot et al., 1995 [18]	1:2.8
Tanzania	Matuja, 1991 [10]	1:2.1
Tanzania	Dent et al., 2001 [20]	1:1.3
Sierra Leone	Lisk, 1987 [14]	1:2.2
Zimbabwe	Levy, 1983 [21]	1:2



**Fig. 1** Early hospital-based migraine prevalence studies



**Fig. 2** Prevalence of migraine in selected African populations



**Fig. 3** Population-based migraine prevalence studies in Africa

Figure 4 shows the age distribution of migraine sufferers in four different African studies [16–18, 24]. We find that general conclusions on peak prevalence cannot easily be drawn because of the different study populations surveyed. However a decline of prevalence of migraine was seen after the age of 40 years except in the 1992 Nigerian study [17].

From most of the publications available it is safe to conclude that classic migraine is relatively rare in the African (Table 2). Surprisingly, Levy from Zimbabwe did not encounter migraine with aura in his survey of a large urban population [21]. The population-based studies from Nigeria [16] and Ethiopia [18] recorded very low rates. However,

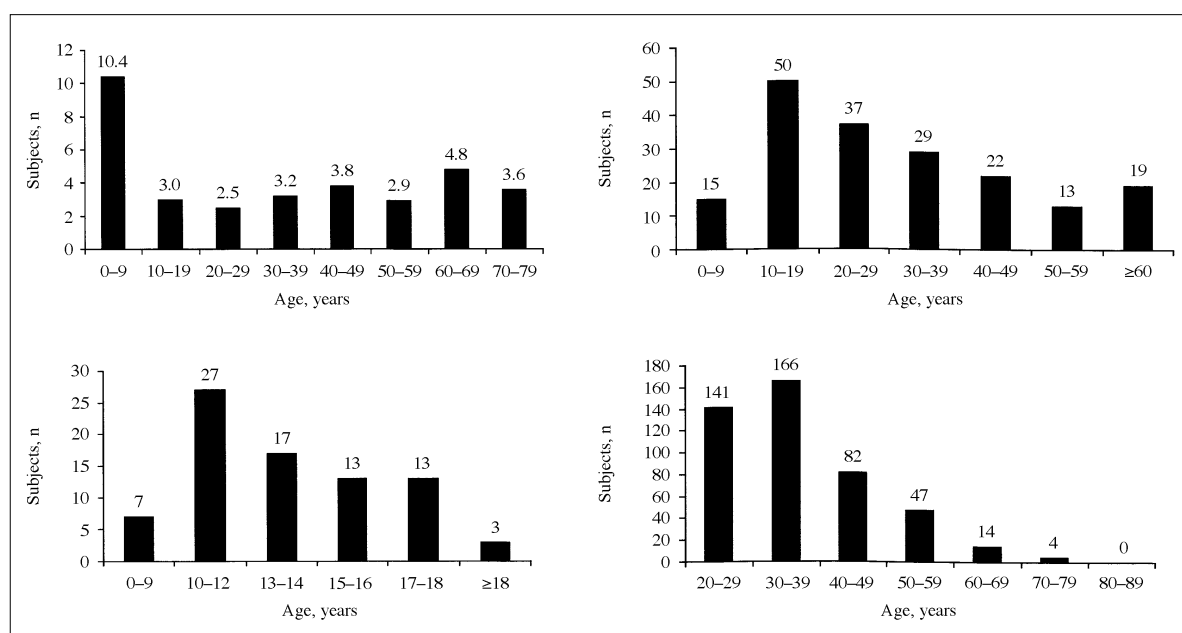
studies from neurology clinics that specifically surveyed headache sufferers in Kenya [9], Tanzania [10] and Sierra Leone [14] reported high rates of 20%–29%. The relative rarity of classic migraine among Africans was commented upon by Lisk in Sierra Leone, who found the condition to be comparatively more common among Lebanese residing in Sierra Leone than among indigenous Africans [14].

Most studies showed that hot climate, particularly exposure to the sun, and physical and emotional stress are the most important trigger factors of migraine in the African. Alcohol and menstruation in women have their contributions. However, food items play a minor role in triggering migraine attacks [12, 18] (Tab. 3).

Khat (*Catha edulis*) is widely used in Ethiopia among various social groups. It is commonly consumed during social recreational gatherings. It has medicinal uses, and it is consumed during ritual and religious ceremonies. Long-distance drivers and students during examination periods chew khat to keep awake. The active substance in khat is cathinone, which closely resembles amphetamine. In a study of 66 khat users, Mekasha [25] found that 25% suf-

fer from frequent headaches. It is therefore not surprising that 12% of the migraine sufferers in the Ethiopian study [18] reported khat as a precipitating factor of their headaches.

In as far as associated conditions are concerned (Tab. 4), epilepsy was seen in 8% and 10.8% of migraine sufferers in two studies in Nigeria [16, 22]. In the same country hemoglobinopathies (sickle cell SS, AS) were associated with



**Fig. 4a-d** Age distribution in migraineurs in African studies. **a** Nigeria [17]. **b** Nigeria [16]. **c** Ethiopia [24]. **d** Ethiopia [18]

**Table 2** Frequency of aura in African migraineurs

Country	Reference	Frequency
Nigeria	Ogunyemi, 1984 [12]	3.9%
Nigeria	Longe and Osuntokun, 1988 [16]	0.4%
Nigeria	Okogbo, 1991 [22]	17.8%
Ethiopia	Tekle Haimanot et al., 1995 [18]	0.3%
Zimbabwe	Levy, 1983 [4]	0%
Tanzania	Matuja, 1991 [10]	20%
Kenya	Amayo et al., 1996 [9]	29%
Sierra Leone	Lisk, 1987 [14]	22%

**Table 3** Trigger factors reported by African migraineurs

Factor	Countries
Mental stress	Kenya [9], Nigeria [12], Zimbabwe [21], Ethiopia [18]
Physical fatigue	Kenya [9], Nigeria [12], Zimbabwe [21]
Heat (hot climate)	Nigeria [12], Sierra Leone [14], Ethiopia [18], Zimbabwe [21], Tanzania [10]
Alcohol	Tanzania [10], Zimbabwe [21],
Menstruation	Zimbabwe [21], Tanzania [10]
Food items	Nigeria (rare) [12], Ethiopia [18]
Khat	Ethiopia [18]

**Table 4** Conditions associated with migraine in Nigeria

Comorbidity	Reference	Frequency among migraineurs
Epilepsy	Longe et al., 1988 [16]	10.8%
	Okogbo et al., 1991 [21]	8%
Hemoglobinopathy (sickle cell AS)	Osuntokun and Osuntokun, 1992 [25]	
	Migraine with aura	60%
	Migraine without aura	20%
	Okogbo et al., 1991 [22]	34%



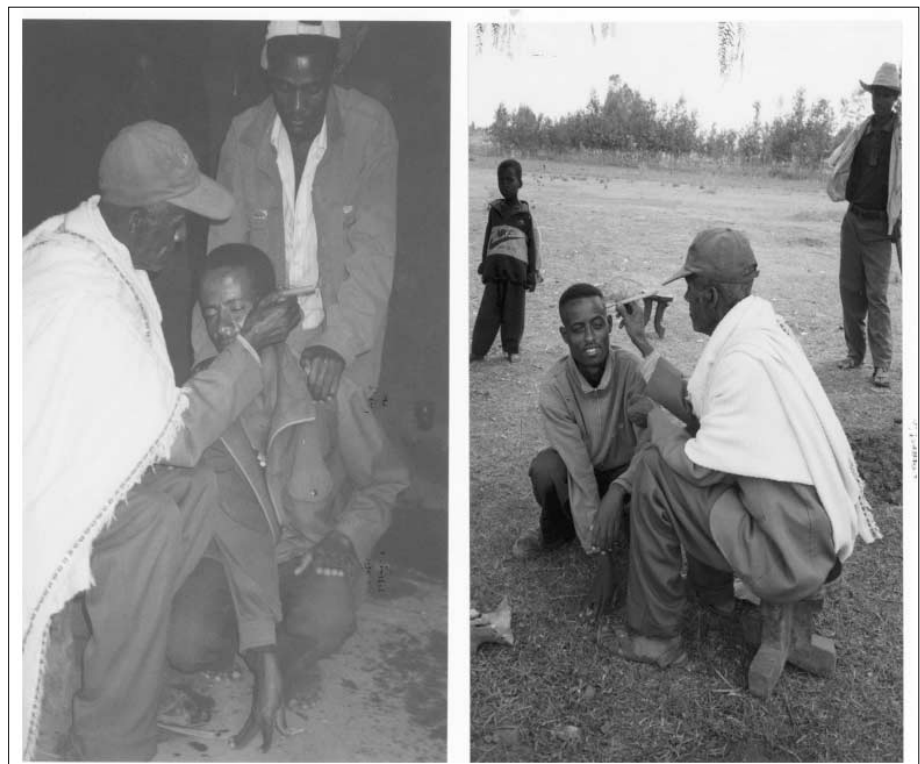
**Fig. 5** A migraine sufferer being offered to sniff a herbal extract prepared by the herbal healer

migraine in 20%–60% of cases. This association was relatively more frequent with classic migraine [26].

Family history of migraine was found in 30%–68% of the migraineurs in the different countries where studies were undertaken [9, 10, 14, 16, 18, 21].

The study of Amayo et al. [9] provides a representative picture of the therapeutic approach to migraine in Africa. There were only few migraineurs on specific medication. As low as 11% used analgesics. The majority opted for self-mediations in the form of traditional and herbal therapies. In Ethiopia different traditional methods are used to deal with acute attacks of headache. For headaches in general (with or without fever) herbal extracts are commonly used. The extract is usually sniffed as shown in Fig. 5. Some patients with chronic headaches apply raw butter on the head. It is believed that the butter would “melt and sink into the scalp” to sooth and calm the throbbing brain within the skull. Others apply a very tight scarf around the head during an acute attack. When the headache is one-sided, throbbing and persistent as in a severe migraine attack, a traditional healer is approached for a cauterization treatment as depicted Fig. 6. Some sufferers are known to perform the procedure on themselves.

It is perhaps appropriate to expand on the reasons for the low prevalence of migraine in the African populations. First, there is the issue of under-diagnosis which arises for a number of reasons. From our surveys we have observed that rural people have a great tolerance to pain. Headache, even if persistent and recurrent, is often perceived as a trivial



**Fig. 6** Ethiopian migraine sufferer being cauterized by a traditional healer. This treatment is commonly used for migraine headaches and other acute pains. Hot bicycle spokes or pieces of iron are used for the procedure

problem. Among the majority of the rural poor, there are other more basic and demanding problems that are given higher priority. Most rural headache sufferers come from a low socioeconomic bracket and are less educated. They lack the awareness. They are therefore less likely to seek proper medical attention. Hence they go for the traditional and herbal treatments. As reported also in the Western literature, migraine sufferers with higher intelligence scores and those from higher socioeconomic groups are more likely to consult a physician [27]. One should also not ignore the fact that medical practitioners in the African setting do not pay a great deal of attention to the problem of headache, which may appear trivial compared with infectious diseases and malnutrition that pose greater threats to public health.

Nevertheless, all these situations considered, the prevalence of migraine among African populations is still lower than that among Europeans. One explanation may be genetic. According to Stewart, the prevalence of migraine among female African-Americans was lower (16.2%) than among female Caucasians (20.4%) [28]. This racial difference seen in the United States may suggest that migraine through genetic determinants may be less prevalent among Africans.

The impact of migraine on individual sufferers and the public has been duly acknowledged and measured in the West. Not so in communities in sub-Saharan Africa. In-depth evaluations of the impact of migraine on absenteeism and productivity have not been specifically performed in Africa. However, two studies have addressed the issue in

two African countries. Among 1540 urban workers and students of higher education in Dar es Salaam, Tanzania, Matuja et al. [19] found that 175 cases had an average of 11.3 lost workdays per year due to headache compared with controls with only 5.7 lost workdays per year for reasons other than headache. Orji and Iloje [23] reported a high incidence of absenteeism among Nigeria schoolchildren with migraine. The paucity of information on this important issue calls for well-designed measurements of the disability and health-related quality of life consequences of headache among Africans.

The widespread and prevalent tension-type headache has not been given due attention in African studies. Well-designed and executed studies on episodic and chronic tension-type headache are lacking. The few studies (Table 5) that have prevalence figures on tension headaches are difficult to compare because of the lack of uniformity in definition and classification. In these studies, there are references to tension headache alone, tension-vascular combination and psychogenic disorders. There is often confusion with the use of the term non-migraneous headache.

The 1-year prevalence of chronic tension-type headache (1.7%) in the Ethiopian study that used the International Headache Society criteria is similar to that reported by Schwartz et al. (2.2%) in the United States [29]. The high (95%) prevalence of tension headache reported by Sebit in Zimbabwe [11] the frequency among headache sufferers referred to a primary care clinic for psychiatric assessment and management.

**Table 5** Frequency of vascular and tension-type headaches in African studies

Reference	Study population	Headache, %	Migraine, %	Tension-type headache, %	Cluster headache, %
Tekle Haimanot et al., 1995 [18]	15 000, rural setting	NR	3	1.7	0.03
Amayo et al., 1996 [19]	711, medical students	88 <sup>a</sup>	33.8	NR	NR
Matuja et al., 1995 [19]	1540, urban workers and students	52	30.8	35.8	NR
Osuntokun et al., 1992 [17]	18 594, urban dwellers	51	5.3	NR	NR
Matuja, 1991 [10]	311, neurology clinic headache cases	20.6	34	11	NR
Ogunyemi, 1984 [14]	1506, university students	60	28.2	19.4	0.3
Dent et al., 2001 [20]	3351, rural setting	23.1	5.1	3.6	0.1
Longe and Osuntokun, 1988 [16]	2925, rural setting	NR	6.3	NR	NR
Levy, 1982 [21]	5028, urban dwellers	20.2	20.8	3.4	NR
Lisk, 1987 [14]	250, clinic headache cases	NR	42	22	NR
Sebit, 1996 [11]	295, clinic headache cases	NR	4.5	95.5	NR

NR, not reported

<sup>a</sup> One episode per 6-month period

Cluster headache is extremely rare in the African according to the literature and our personal experiences.

Migraine in Africans is not as rare as it was reported in earlier reports. It is however under-recognized and accorded low priority. Its clinical manifestations in Africans are similar to those seen in other populations. It is an undertreated conditions where a low percentage of the sufferers receive specific treatment. The majority of migraineurs resort to herbal and traditional healers. There are few studies that have addressed the issue of disability assessment. Hence the impact on health facility utilization and sickness absence from work are not well documented. The prevalence and impact of chronic tension-type headache has also been poor-

ly investigated in African populations. It is the wish of many neurologists practicing in Africa that future headache epidemiological investigations will be comprehensive and use protocols that are closely related to the classification of the International Headache Society [30]. Migraine disability assessment will also be essential because, as Lipton observed, "disability is a powerful predictor of treatment needs; failure to include it in the evaluation of a patient with migraine is a major barrier to health care" [31].

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