



Tropical medicine rounds

Spectrum of skin diseases in Maroon villages of the Maroni area, French Guiana

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Introduction

French Guiana is the only French overseas territory in America, inhabited by multiple communities who arrived through successive waves of migration from Europe, Asia, and Africa. Amerindians are the first autochthonous inhabitant of the country. Maroons (locally called “Businenges” from the colloquial term “Bush Negroes”) are descendants of slaves from former Dutch Guiana, who escaped from coastal plantations and fled to the hinterland. In the West Indies, these runaways survived in isolated mountains, which gave birth to the word “Maroon” from Spanish “cimarrones,” meaning “mountaineers.” In the Guianas, Maroon people settled along the Maroni river where they

Abstract

Background Due to their genetic characteristics and their high exposure to infectious diseases, Maroons are likely to suffer from a specific spectrum of skin diseases. However, skin disorders have never been explored in this population. We aimed to describe all skin diseases in Maroon villages of the Maroni region in French Guiana.

Methods This retrospective study concerned all patients who consulted in the remote health centers of Apatou, Grand-Santi, Papaïchton, and Maripasoula between October 5, 2017, and June 30, 2020. We included all patients registered with a skin disorder (International Classification of Diseases) in the medical database. We excluded patients whose diagnosis was invalidated after cross-checking by a dermatologist.

Results A total of 4741 patients presented at least one skin disease, for 6058 different disorders. Nonsexually transmitted infections represented 71.6% of all diagnoses, followed by inflammatory diseases (9.8%) and bites/envenomations (4.6%). The three most frequent conditions were scabies, abscesses, and impetigo. Besides scabies, neglected tropical diseases (NTDs) were still prevalent as we reported 13 cases of leprosy and 63 cutaneous leishmaniasis. Atopic dermatitis (AD) represented only 2.5% of our diagnoses.

Conclusions With the exception of AD, which was less frequent among Maroons, these results are similar to those previously reported in Amerindians. Therefore, a common exposure to rainforest pathogens seems to induce a common spectrum of skin diseases dominated by infections. The high prevalence of NTDs requires specific public health actions.

created independent kingdoms with strong African cultural traditions. They still dwell along this river, which now constitutes the official border between Surinam and French Guiana. Nowadays, they maintain a traditional way of life in a rainforest environment, but some aspects of their everyday life are undergoing a Westernization process.

Even though about the total number of Maroons in French Guiana is probably close to 100,000,¹ few health data are available for this community. Maroons are likely to present a different spectrum of diseases than their Creole or European neighbors due to their genetic characteristics^{2,3} and high exposure to infectious diseases in a rainforest environment. Several neglected tropical diseases (NTDs) such as cutaneous

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leishmaniasis (CL)⁴ have been reported in Maroons from Surinam. Viruses such as HIV or HLTV^{5,6} have a high prevalence in Maroons, who have benefited from various HIV prevention programs.^{7,8}

Skin diseases among Maroons in French Guiana have never been explored. A previous study conducted among Amerindians, another autochthonous group from the remote areas of French Guiana, showed that most dermatological diseases were infectious, followed by atopic dermatitis (AD). This study also reported a low prevalence of sexually transmitted infections and no case of skin cancer.⁹ Therefore, a similar study carried out in a large Maroon population would help to guide public health actions concerning skin diseases.

Census of the population according to ethnic criteria is not allowed under French law. However, the specific organization of the Guyanese health system makes it possible to study Maroons by referring only to geographical criteria. Indeed, primary care in the French Guiana hinterland is maintained by remote health centers called RHPC (Remote Health Centers for Prevention and Care). Some of these health centers are located in Maroon villages where almost all patients belong to this community (Apatou, Grand-Santi, and Papaïchton). Maripasoula is a small town where significant minorities are present (Amerindians, Haitians, and Brazilians notably) but the majority of the population belongs to the Maroon community. Therefore, collected data from these RHPC (Apatou, Grand-Santi, Papaïchton, and Maripasoula) would yield data which could be extrapolated to the whole Maroon community.

Our objective here was to describe the spectrum of skin diseases among inhabitants of the Maroon villages of French Guiana.

Materials and methods

We conducted an observational, retrospective study in four health centers located in Maroon settlements areas. These centers gather almost all medical means available in these villages. The largest one, Maripasoula, is a city on the upper course of the Maroni river. Grand-Santi and Papaïchton are located a few hours downstream by canoe, while Apatou is in the Lower Maroni area, an hour-drive away from the major city of Saint-Laurent du Maroni. Concerning the different population groups, Maripasoula and Papaïchton are predominantly inhabited by Aluku Maroons, while the Ndjuka people make up most of the residents of Grand-Santi and Apatou. We selected patients who had consulted a general practitioner or a dermatologist in one of these health centers and were classified with a code from the International Classification of Diseases referring to a skin disorder. Data were collected from the medical files saved in a prospective database through the SISv2 software, and then anonymized and protected for analysis during the study. This software allows practitioners to record medical files and to send requests for teledermatology consultations. On-field

missions by dermatologists from Cayenne are also performed on a bi-monthly basis.

All data from the clinical examinations were cross-checked by a dermatologist to correct quotation errors. We included all patients who had a confirmed dermatological disorder, from October 5, 2017 to June 30, 2020. Patients could present with several dermatological conditions during the study period. Each diagnosis was counted once per patient, regardless of whether it required one or more consultations, and was included in the number of skin disorders. For the same dermatological condition, patients could have several consultations, counted in the number of consultations. Patients whose dermatological diagnosis was invalidated were excluded. Patients with a nationality other than French or Surinamese were excluded.

Collection and analysis of data for this study were authorized by the corresponding French ethical authority (*Commission Nationale Informatique et Libertés*, CNIL) under the authorization number 920438.

Results

Population characteristics and categories of skin disorders

During the study period, 9011 consultations were extracted from SISv2 software. As we aimed to target the Maroon population, we excluded 1411 consultations of patients whose nationality was Brazilian, Chinese, Dominican, or Haitian. Data from these excluded files are available in Table S1 and may be used for comparisons. We also excluded 49 consultations of patients who consulted in a Maroni health center while traveling in the area but dwelt in another region of French Guiana. Finally, we excluded the sexually transmitted diseases ($n = 98$) and all misclassified diagnoses ($n = 347$) which were unrelated to dermatological diseases.

The remaining 7155 consultations were provided to 4741 patients, who formed the study population (Table 1). Among these 4741 patients, 6058 different skin disorders were recorded (Tables 2 and 3). The sex ratio was almost equal (2376 women, 50.1%). The population was rather young, with a median age of 22.³⁻³¹ Underage patients (<18) formed the largest group (59.6%). Most patients were French (54.8%), 12.5% were Surinamese or Guyanese. The nationality of a large group of patients was not recorded but was presumably French or Surinamese (32.2%) as nonresidents are recorded in a specific way.

Among the different recorded skin disorders, infectious diseases were by far the most frequent (71.6%) (Table 2), followed by inflammatory diseases (9.8%) (Table 3). Bites and envenomations represented 4.6% of the recorded disorders. There were few skin tumors (0.5%) and three genodermatoses. A few clinical presentations of interest are presented in Figure 1.

Table 1 General characteristics of the study population, 4741 patients from Maroon settlements of the Maroni area, French Guiana, 2017–2020

Characteristics	Number of patients <i>n</i> (%)
Gender	
Female	2376 (50.1)
Male	2365 (49.9)
Median age [IQR]	22 (3–31)
Age	
<18	2825 (59.6)
≥18	1916 (40.4)
18–25	419 (8.8)
26–50	1130 (23.8)
51–65	273 (5.8)
>65	94 (2.0)
Nationality	
French	2596 (54.8)
Surinamese	576 (12.1)
Guyanese	17 (0.4)
Unknown	1526 (32.2)
Other	26 (0.5)

Tele dermatology

Among the 7155 consultations, tele dermatology was used in 213 cases (2.9%), and patients were referred to a dermatologist in 171 cases (2.4%). Among them, specialized advices were needed for 50% of skin tumors (18 out of 36 consultations needed for 28 tumors) and for 13.4% of inflammatory diseases (91/680). Concerning infectious diseases, a dermatological advice was needed in 205 cases, mostly for neglected tropical bacterial or parasitic infections such as CL, leprosy, or scabies.

Infectious diseases

Among infectious diseases, bacterial infections were the most common (32.9%). Among them, the most frequent were

cutaneous abscesses (36.1%), impetigo (35.5%), and erysipelas (11.5%). Most patients (96.1%) were treated at home. Impetigo was mostly seen under the age of 18 (89.8%), with a similar sex ratio (46.7% of boys/men). All patients diagnosed with impetigo were treated at home. Erysipelas were more severe as they led to 26 overnight observations and nine transfers (11.7%) to the Cayenne Hospital. Triggering factors such as wounds, intertrigo, or myiasis were involved in 19.6% of cases.

We observed 13 cases of leprosy, including one pediatric case. We recorded seven paucibacillary forms and five multi-bacillary, while one histology was missing. One case of leprosy was diagnosed before 2007, three between 2007 and 2014, and nine between 2014 and 2020. All of them were referred to a dermatologist during one of the specialized on-field missions. One patient was transferred to the Cayenne Hospital because of a type 2 leprosy reaction.

Among skin infections, parasites represented the second most frequent pathogens category (17%). Scabies was the most reported diagnosis (87.5%) and led to 1067 consultations. Children were more concerning (68.1%). A positive contact history within the family was recorded in 50% of cases while contagion in schools or boarding schools was involved in only 3.8%. We also reported 63 cases of CL (6.1%). A parasitological confirmation of CL was available in 35 cases (63.6%), including 23 PCR and 12 skin smears. Species identification was available in 17/35 patients (48.6%), *Leishmania guyanensis* in eight patients, *L. braziliensis* and *L. lainsoni* in six and three patients, respectively. Empiric treatment by intramuscular injections of pentamidine was given in 30 patients. Only one patient whose results showed *L. braziliensis* received a first-line treatment by amphotericin.

We reported fungal infections in 12.4% of cases, including frequent dermatophytosis, *pityriasis versicolor*, and candidiasis. On the other hand, we did not record any case of endemic fungal infection such as lobomycosis or paracoccidioidomycosis. Viral infections were observed in 9.2% of cases, mostly in

Table 2 Infectious skin disorders recorded among 4741 patients from the Maroon settlements areas, French Guiana, 2017–2020 (*n* = 6058 recorded disorders)

Nonsexually transmitted infections <i>n</i> = 4335 (71.6%)			
Bacterial <i>n</i> = 1996 (32.9%)	Parasitic <i>n</i> = 1029 (17%)	Fungal <i>n</i> = 751 (12.4%)	Viral <i>n</i> = 559 (9.2%)
Abscess <i>n</i> = 721	Scabies <i>n</i> = 902	Dermatophytes <i>n</i> = 389	Chickenpox <i>n</i> = 309
Impetigo <i>n</i> = 709	Leishmaniasis <i>n</i> = 63	Pityriasis versicolor <i>n</i> = 186	Herpes simplex virus <i>n</i> = 74
Secondary impetiginization <i>n</i> = 146	Hookworm-related cutaneous	Candida <i>n</i> = 126	Hand, foot, and mouth
Erysipela <i>n</i> = 230	larva migrans <i>n</i> = 17	Undetermined cutaneous	disease <i>n</i> = 51
Cellulitis <i>n</i> = 61	Chiggers <i>n</i> = 17	mycoses <i>n</i> = 50	Viral rash <i>n</i> = 50
Folliculitis <i>n</i> = 37	Myiasis <i>n</i> = 13		Shingles <i>n</i> = 28
Paronychia <i>n</i> = 30	Head lice <i>n</i> = 11		Pityriasis rosea <i>n</i> = 16
Furuncle, carbuncle, ecthyma <i>n</i> = 20	Tungiasis <i>n</i> = 5		Roseola infant <i>n</i> = 13
Leprosy <i>n</i> = 13	Pthiriasis <i>n</i> = 1		Molluscum contagiosum <i>n</i> = 9
Gram-negative intertrigo <i>n</i> = 2			Warts <i>n</i> = 8
Scarlet fever <i>n</i> = 2			Dengue fever <i>n</i> = 1
Other localized infection <i>n</i> = 25			

Table 3 All noninfectious diagnoses among the 6058 dermatological and venereological disorders recorded among 4741 patients from the Upper Maroni, French Guiana, 2017–2020

Genodermatosis <i>n</i> = 3 (0.05%)		Inflammatory <i>n</i> = 591 (9.8%)		Bites and envenomation <i>n</i> = 281 (4.6%)	Others <i>n</i> = 577 (9.5%)
Albinism <i>n</i> = 3	Skin tumors <i>n</i> = 28 (0.5%)				
Wounds, eschars <i>n</i> = 243 (4%)	Benign <i>n</i> = 22	Malignant <i>n</i> = 6	Atopic dermatitis <i>n</i> = 149	Arthropods <i>n</i> = 90	Itching <i>n</i> = 177
Burn <i>n</i> = 145	Pyogenic granuloma <i>n</i> = 8	Basal cell carcinoma <i>n</i> = 3	Urticaria, angioedema <i>n</i> = 109	Snakes <i>n</i> = 47	Apocrine miliaria <i>n</i> = 55
Wounds <i>n</i> = 85	Lipoma <i>n</i> = 6	Melanoma <i>n</i> = 2	Contact dermatitis <i>n</i> = 87	Dogs <i>n</i> = 39	Scars, cheloid scars <i>n</i> = 34
Chronic ulcers <i>n</i> = 13	Skin tag <i>n</i> = 2	Squamous cell carcinoma <i>n</i> = 1	Prurigo <i>n</i> = 66	Hymenopteran <i>n</i> = 27	Cysts <i>n</i> = 32
	Actinic keratosis <i>n</i> = 2		Acne, rosacea <i>n</i> = 47	Fish, stingrays, leech <i>n</i> = 27	Xerosis <i>n</i> = 22
	Nevi <i>n</i> = 1		Seborrheic dermatitis <i>n</i> = 46	Scorpions <i>n</i> = 20	Nail disorder <i>n</i> = 21
	Giant congenital nevi <i>n</i> = 1		Dyshidrosis <i>n</i> = 39	Bat <i>n</i> = 14	Diaper rash <i>n</i> = 19
	Juvenile xathogranuloma <i>n</i> = 1		Psoriasis <i>n</i> = 15	Monkeys <i>n</i> = 6	Acute lymphadenitis <i>n</i> = 16
	Other <i>n</i> = 1		Lichen, lichenification <i>n</i> = 11	Lepidopterism <i>n</i> = 4	Autosensitization dermatitis <i>n</i> = 15
			Lupus <i>n</i> = 2	Cats <i>n</i> = 3	Mouth disorder <i>n</i> = 11
			Keloidal folliculitis <i>n</i> = 2	Pecari tajacu <i>n</i> = 2	Hyperkeratosis <i>n</i> = 5
			Erythema nodosum <i>n</i> = 2	Rat <i>n</i> = 1	Sunburn <i>n</i> = 3
			Vitiligo <i>n</i> = 2	Man <i>n</i> = 1	Foreign matter <i>n</i> = 3
			Kawasaki's disease <i>n</i> = 2		Pigmentation disorder <i>n</i> = 2
			Bullous pemphigoid <i>n</i> = 1		Stasis dermatitis <i>n</i> = 1
			Eosinophilic folliculitis <i>n</i> = 1		Hyperhidrosis <i>n</i> = 1
			Sweet's disease <i>n</i> = 1		Ecchymosis <i>n</i> = 1
			Infancy acropustulosis <i>n</i> = 1		Alopecia <i>n</i> = 1
					Other eruption <i>n</i> = 156

children (83%). Chickenpox was the most frequent one (55.2%). Twenty-five cases were recorded in adults but did not lead to severe presentations.

Inflammatory diseases

Atopic dermatitis was recorded in 149 patients (2.5% overall). We also reported 18.3% of urticaria and 11.1% of prurigo. Among 87 cases of contact dermatitis, traditional remedies and the application of plants were found as a trigger in 18 cases.

Bites and envenomations

We observed 281 cases of bites or envenomation (4.6%). Most of them were caused by insects: arthropods (spiders, centipedes, ticks, and mosquitos) in 32% of cases and hymenopterans (bees, wasps, and ants) in 9.6%. Snakes were the second most frequent cause of envenomations (16.7%), leading to 17 observations (36%) and 24 transfers (49%). Aquatic animals (fishes, stingrays, and leeches) were involved in 11.6% of cases. Amoxicillin, with or without clavulanic acid, was the only antibiotic given after envenomations.

Skin tumors

Skin tumors were rare (0.5%), as we reported only 22 benign tumors and six malignant tumors including two acral lentiginous melanomas, one squamous cell carcinoma, and three basal cell

carcinomas. All malignant tumors received dermatological advice by tele dermatology, and the two patients with melanoma were hospitalized for an initial evaluation.

Genodermatosis

We reported three cases of oculocutaneous albinism. Two were followed by pediatricians while the third patient, age 70, was known by the dermatologists because of a history of multiple squamous cell carcinomas.

Outcomes

Among the 7155 consultations, 6921 (96.7%) were followed by home outing. Overnight observation in a health center was rarely needed (1.6%), mainly in case of bacterial infections (39.3%) or bites/envenomations (33%) by snakes or scorpions. Similarly, transfers to the Cayenne Hospital (122 cases, 1.7%) were mostly caused by bacterial infections (49.1%), followed by bites and envenomations (23.7%) and burns/wounds (16.4%). The only recorded death due to a skin disease was observed in a patient with extensive burns.

Discussion

This study offers a good insight into the epidemiology of skin disorders in the Maroni area, where the health system is vastly



Figure 1 Clinical presentation of several skin disorders among patients from Maroon settlements area, French Guiana, 2017–2020, extracted from dermatological telemedicine queries and taken with patients' approval; ecthyma and impetigo of the face in a young boy (a); seborrheic dermatitis in childhood (b); several lesions of cutaneous leishmaniasis in a young girl (c); scabies with numerous pustules involving the face, arms, and trunk (d); hookworm-related cutaneous larva migrans in the elbow crease (e); type 2 leprosy reaction or *erythema nodosum leprosum* (f); sequellary foot deformity due to leprous neuropathy (g); cutaneous squamous cell carcinoma in an elderly patient with albinism (h); dermatophytic infection of the scalp (i); acrolentiginous melanoma (j); infantile acropustulosis (k); inflammatory and ulcerated edema of the left hand after a snake bite (l)

based on primary caregivers. Skin infections were by far the main causes of dermatological consultations (71.6%). These data contrast with European epidemiology. In a recent British study about dermatological problems in general practice consultations, only 45 of 318 patients had at least one skin disorder, of which 32% had an infectious disease.¹⁰ However, our data are in line with the proportion of infections in skin disorders recorded among Amerindians of the Upper Oyapock (Teko and Wayampi nations), as reported by Malmontet et al. with a similar methodology.⁹ As Amerindians of the Wayana nation represent a small part of the French or Surinamese patients seen in the health center of Maripasoula, some of them were most likely included in our study population. However, the data from our mostly Bushinengue cohort seem to show that these two autochthonous populations share a common burden of infectious skin diseases.

In this cohort, the most frequent disorders were scabies, impetigo, and dermatophytosis. Scabies was more frequent in

children, which was expected.¹¹ A high prevalence of scabies was also reported in Amerindians of the Oyapock area.⁹ Scabies led to an important number of consultations (14.7% overall). Treatment was often given only to the index patient, without associated treatment of the family and the environment, leading to treatment failure and family outbreaks.¹² As commonly described, scabies was a risk factor for impetigo. Impetigo was more often reported in children, with a notion of reinfestation (1.2 consultations per patient).

Leprosy is a re-emerging disease in French Guiana. Previous data have shown an increase in new cases between 2007 and 2014.¹³ Our data seem to support these conclusions among Maroons, as we recorded three cases between 2007 and 2014 and nine cases between 2014 and 2020, while only one case was recorded before 2007. However, our inclusion criteria meant that we included only patients with active disease or disabilities requiring dermatological care. Therefore, patients with cured leprosy might have been omitted. Though leprosy in

French Guiana was initially found mostly in Maroon people, an epidemiological shift towards Brazilian patients was observed in the 2010s, along with illegal immigration of Brazilian gold miners.¹³ In our Table S1, nine leprosy cases were recorded among Brazilian patients. However, our findings show that Maroon villages are still an active epidemic area, with several cases including an active pediatric infection.

Cutaneous leishmaniasis was another significant NTD in our study. A male predominance was observed, as in the overall population of patients infected with CL in French Guiana. Of the 17 cases with species identification, *Leishmania guyanensis* and *L. braziliensis* were found in 47% and 35% of cases, respectively. In previous data, *L. guyanensis* was responsible for 80%–86% of infections, while *L. braziliensis* represented only 6%–10% of infections.^{14,15} Some data have suggested an increase in the proportion of *L. braziliensis* in the hinterland of French Guiana, possibly due to an increased ecosystem disruption by gold mining or a better detection thanks to new PCR techniques.¹⁵ However, it is also possible that *L. braziliensis* infections were more systematically recorded as this species is harder to treat than *L. guyanensis*. In our supplementary data, CL represented a higher proportion of skin disorders (23.9%). This can be related to the high exposure of these patients, as illegal gold mining camps manned by Brazilian immigrants are known to be particularly favorable environments for CL transmission.¹⁶

Though fungal infections were less frequent, a large number of consultations (13%) were still caused by dermatophytosis, pityriasis versicolor, and candidiasis. The hot and humid tropical environment of the French Guiana hinterland may explain this frequency. Interestingly, we found two cases of lobomycosis but they both concerned Brazilian patients (Table S1). This fungal infection has already been reported in French Guiana in Brazilian patients.^{17,18} Endemic Amazonian mycoses such as lobomycosis or paracoccidioidomycosis do not seem to affect Maroon people in a significant way.

Skin cancers were rarely recorded in this study, mirroring data from the literature. A low prevalence of skin cancers has been reported in Surinamese migrants,¹⁹ and the incidence rate of melanoma in Southern America is lower than the global rate.²⁰ Indeed, dark skin phenotypes give a natural protection against cutaneous carcinomas and melanomas.²¹ In our study, two patients presented with acrolentiginous melanomas, both in advanced stages. In a previous retrospective study of melanomas in French Guiana, dark phototype patients had a higher median Breslow index and were prone to advanced stages.²² This diagnostic delay was explained by an absence of awareness and barriers to health care access in isolated populations. Acrolentiginous melanoma should be subject to increased awareness among physicians and their patients as it is the most frequent histotype in dark phototypes.^{22,23}

Moreover, albinism is a rare skin disease but an important risk factor for skin cancers.²⁴ We reported three cases of

albinism in a population roughly estimated at 36,000 inhabitants,^{25–28} mirroring reported rates in African countries such as Nigeria.²⁹ Because of cultural beliefs and lack of education concerning this pathology, patients with albinism may suffer from discrimination and have lesser access to health care.^{29,30} However, qualitative studies have never been performed on this issue in French Guiana, and semi-structured interviews could provide useful data on the level of stigma associated with albinism. Health care providers should be aware of the importance of prevention and education for sun protection as chronic skin damage can be found since 12 months of age.^{31,32}

In our study, inflammatory diseases were also common, the most prevalent being AD (2.5% overall). This prevalence is similar to that found in adults living in Cameroon³³ or in the mainland French population (4%) but much lower than reported among Amerindians of French Guiana⁹ despite a similar lifestyle. Conversely, some studies suggest that patients with dark phototypes are more likely to have AD than fair-colored patients.^{34,35} Data concerning the role of filaggrin mutations are contradictory.^{36,37} An African ancestry background is more likely to induce a stronger Th2 immune response and an allergic disease.³⁸

In our study, bites and envenomations were frequent, particularly snakebites, which are associated with a high mortality and are now considered an NTD.³⁹ No patient died in our cohort, possibly showing the effects of recent public health actions in the management of snakebites.⁴⁰ However, improvements should be made concerning the use of antibiotics after a snakebite or infection with aquatic-borne pathogens. All our patients with snakebites or infections in the aquatic context were treated with amoxicillin, which is not efficient against bacteria belonging to the *Aeromonas* genus, often reported after snakebites. Cephalosporins or quinolones are recommended in case of skin infection caused by a snakebite or aquatic route of infection.⁴¹

Despite important genetic variations between Maroons and Amerindians, the spectrum of skin diseases among these two autochthonous populations is almost identical. These findings highlight the importance of a common exposome in the harsh environment of the Amazon rainforest. A few exceptions are worth noticing: AD was much rarer among Maroons than in Amerindians. Endemic mycoses such as lobomycosis and paracoccidioidomycosis were not found in Maroon patients, and cases detected in French Guiana seem to be limited to Brazilian gold miners. Therefore, the mining activity in the Amazon environment seems specifically linked to the risk of deep mycoses infection. These data provide useful hints for all populations living in the Amazon basin.

This retrospective study has several limitations. Though the remote health centers are almost the only care providers in these areas, we cannot rule out that some patients living in these villages looked for health care in Saint-Laurent or in Surinam. Clinical outcome was sometimes missing, which can be explained by medical nomadism between different health

centers, geographical barriers to health care, and a lack of faith in Western medicine. Skin disorders were initially recorded by general practitioners, who are less trained than dermatologists. We aimed to limit these biases by cross-checking all diagnoses by a dermatologist, but a few misclassifications could have been unnoticed. On the other hand, this study shows that the use of teledermatology helps to manage specific skin disorders such as tumors, leishmaniasis, or leprosy. Dermatology is the first specialty represented in teleconsultations requests in French Guiana.⁴² Teledermatology also plays an important part in the dermatological training of GPs working in remote areas.⁴³

Despite these limitations, this study provides data on a large population which has been little studied. These findings will help to improve the management of skin disorders in Maroons in French Guiana as well as in other countries with important communities such as Surinam, Guyana, Jamaica, or Brazil. This study confirms that, excepting AD, the Amazonian exposome is the main factor responsible for the spectrum of skin diseases observed in different populations of the area.

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Supporting Information

Additional Supporting Information may be found in the online version of this article:

Table S1 Causes for consultation in excluded patients whose nationality was Brazilian, Chinese, Dominican, or Haitian, Maroon settlements areas, French Guiana, 2017–2020.