Scientific Research Publishing

Open Journal of Psychiatry, 2026, 16(3), 241-253
https://www.scirp.org/journal/ojpsych
ISSN Online: 2161-7333
ISSN Print: 2161-7325

Addictological Profile of Patients Using Psychoactive Substances Followed at the National Mental Health Center (CNSM) of Libreville in 2025

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How to cite this paper: Dope, K.R., Abessolo, O.1erT.S., Traoré, B.S., Goncé, D.A., Moussavou, I. and Mboussou, M. (2026) Addictological Profile of Patients Using Psychoactive Substances Followed at the National Mental Health Center (CNSM) of Libreville in 2025. *Open Journal of Psychiatry*, **16**, 241-253.
https://doi.org/10.4236/ojpsych.2026.163019

Received: May 18, 2026
Accepted: July 14, 2026
Published: July 17, 2026

Abstract

Introduction: Comorbidity between psychiatric disorders and psychoactive substance (PAS) use represents a major challenge in mental health, with prevalence rates estimated between 40% and 70% in sub-Saharan Africa, depending on the type of pathology and sociocultural context. In Gabon, data remain scarce. This study aimed to investigate the addictive profile of PAS users based on urine drug screening tests performed at the National Mental Health Center (NMHC) in Libreville, Gabon. **Methods:** A descriptive cross-sectional study with an analytical aim was conducted from June 30 to September 30, 2025, among patients who underwent urine drug screening. Urine screening was performed consecutively for all eligible psychiatric patients presenting during the study period. Associations with positivity were assessed using univariate logistic regression for age and chi-square or Fisher exact tests for categorical predictors, with odds ratios (ORs) and 95% confidence intervals (CIs) reported. **Results:** The mean age was 35.1 ± 14.2 years, with 71.8% males. The overall urine-test positivity rate was 65.0% (76/117). Benzodiazepines (46.2%) and cannabinoids (12.8%) were the most frequently detected substances. Younger age was associated with positivity (OR per year = 0.97; 95% CI: 0.94 - 1.00; p = 0.022). Withdrawal symptoms showed higher odds of positivity at the conventional threshold (OR = 4.40; 95% CI: 0.95-20.43; Fisher exact p = 0.050). Sex (OR = 2.02; 95% CI: 0.82 - 5.02; p = 0.125) and previous patient status (OR = 1.68; 95% CI: 0.74 - 3.81; p = 0.212) were not statistically significant. Among test-positive patients, psychotic disorders accounted for

47.4% of diagnoses. **Conclusion:** In this single-center cross-sectional sample, PAS positivity was frequent and mainly driven by benzodiazepines and cannabinoids. The findings support targeted screening and integrated psychiatry-addiction collaboration at the CNSM, while causal inference and national generalization require multicenter prospective confirmation.

Keywords

Psychoactive Substances, Urine Drug Screening, Psychiatric Comorbidity, Gabon

1. Introduction

The use of psychoactive substances (PAS) constitutes today a major global public health problem, due to its impact on morbidity, mortality, and the social disorganization it generates. According to the World Drug Report 2024 of the United Nations, nearly 296 million people used at least one drug in the past year, representing an increase of more than 23% over ten years [1]. This trend is particularly concerning in low- and middle-income countries, where health systems are often ill-prepared to manage the psychiatric and social consequences of such use [2].

In mental health, the relationship between psychiatric disorders and PAS use is close, bidirectional, and complex. Mental disorders can promote substance use in an attempt at self-medication, while chronic drug use can trigger or aggravate psychiatric symptoms [3] [4]. The main substances involved are benzodiazepines, cannabinoids, stimulants (such as cocaine or amphetamines), and opioids, whose neuropsychiatric effects modify brain circuits involved in reward, motivation, and inhibitory control [5].

In sub-Saharan Africa, the prevalence of comorbidity between mental disorders and PAS use varies between 40% and 70%, depending on the type of pathology and the sociocultural context [6] [7]. Young adults, often confronted with unemployment, precariousness, and social exclusion, represent the most exposed population [8]. Beyond traditional consumption of cannabis or alcohol, a concerning emergence of the misuse of psychotropic medications such as anxiolytics and opioid analgesics is observed [9].

In Gabon, available data on PAS use in psychiatric populations remain limited and fragmentary. In nearby West Africa, a Benin psychiatric-consultation study showed that urine testing can identify recent psychoactive substance use more often than self-report, underscoring the need for locally verified biological data [10].

The CNSM of Libreville, the reference structure for psychiatry in Gabon, receives the largest number of patients presenting with behavioral disorders, acute psychotic episodes, or withdrawal syndromes in Gabon. These clinical presentations are generally attributed to PAS use without biological confirmation. This observation raises the need for a descriptive study with an analytical aim based on chromatographic urine tests, in order to better objectify consumption profiles.

The objective of this study was to describe the addictological profile of psychiatric patients at the CNSM of Libreville from the results of urine drug screening tests and to explore associated sociodemographic and clinical factors.

2. Methods

2.1. Study Type, Setting, and Period

This is an analytical cross-sectional study conducted among 117 patients followed at the CNSM of Libreville, the main public reference structure in psychiatry in Gabon. The CNSM has an inpatient ward, an outpatient consultation service, and a toxicology laboratory affiliated with the medical biology department. Urine screening was performed consecutively for all eligible psychiatric patients presenting during the study period, regardless of clinical indication. The survey for this study was carried out from June 30 to September 30, 2025, a period of three (03) months.

2.2. Study Population

The target population was made up of all psychiatric patients (former or new) from the city of Libreville, and the source population consisted of patients received at the CNSM during the study period.

2.3. Inclusion Criteria

- Patients (men or women, former and new) received at the CNSM: the status of former and new patient was sought at the time of urine collection. New patients were those at their first contact with psychiatry.
- Having a complete medical file.
- Having undergone a chromatographic urine drug screening test during the study period.
- Having given verbal or implicit consent for the use of their data for research purposes during urine collection (in accordance with the CNSM institutional policy).

2.4. Exclusion Criteria

- Incomplete files.
- Missing or invalid test results.

A total of 117 patients were retained for the final analysis out of 120.

2.5. Data Sources and Collection Methods

Information was extracted from individual medical files and laboratory forms. The data collected concerned:

- Sociodemographic variables: age, sex, marital status, occupation, nationality, patient status (former or new).
- Clinical variables: reason for consultation (agitation, aggressiveness, withdrawal, behavioral disorder, etc.), principal diagnosis according to the International

Classification of Diseases, 10th revision (ICD-10).

- Biological variables: nature of the sample, technique used, result (positive/negative), and type of substance detected.

All data were entered and validated by double entry in Microsoft Excel 2021.

2.6. Biological Procedures

Urine tests were performed at the CNSM toxicology laboratory according to the standards of psychoactive substance screening.

- Type of sample: fresh urine sample collected in a sterile flask, analyzed within two hours of collection.
- Analytical method: thin-layer chromatography (TLC) for qualitative detection of common psychoactive substances.
- Substances screened: benzodiazepines, cannabinoids (THC), methadone, oxycodone, cocaine, amphetamines, barbiturates, and opiates.
- Positivity criteria: detection of a characteristic spot at a specific migration ratio, compared to the positive control of the kit.
- Results were interpreted by the laboratory biologist, in independent double reading.

For benzodiazepines, a positive result was classified as treatment-linked only when the extracted chart field for current treatment documented active benzodiazepine treatment at the time of urine collection. Benzodiazepine-positive results without documented current benzodiazepine treatment were classified as not linked to documented treatment. The absence of data on the exact delay between drug administration and sample collection and the pharmacokinetic variability of benzodiazepines do not allow positivity to be attributed with certainty to iatrogenic versus non-prescribed use; this limitation is discussed further.

2.7. Statistical Analy

Data were analyzed using Python (v3.11), libraries Pandas, Scipy, Matplotlib, and Seaborn, under statistical supervision. Quantitative variables were expressed as mean ± standard deviation (SD) or median according to their distribution. Qualitative variables were presented as absolute and relative frequencies (percentages).

Univariate analysis: age was analyzed as a continuous predictor using univariate logistic regression, with urine test positivity as the binary outcome. Binary and categorical predictors (sex, patient status, reason for consultation) were analyzed using chi-square tests or Fisher exact tests when expected cell counts were below 5. Effect sizes were reported as odds ratios (ORs) with 95% confidence intervals (CIs). The significance threshold was set at $p < 0.05$. Univariate effect estimates were visualized in a forest plot.

2.8. Ethical Considerations

The study was conducted in accordance with the principles of the Declaration of Helsinki (2013). Ethical approval was obtained from the National Commission for

Medical Research Ethics of Gabon under reference No. 038/MS/SG/DCNM, approved on June 2, 2025. Consent was obtained from participants at the time of urine sample collection in accordance with CNSM institutional procedures. Patient anonymity and confidentiality were strictly preserved, and all data were used exclusively for scientific research purposes.

3. Results

3.1. General Characteristics of the Study Population

A total of 117 patients were included out of 120. Numeric age was available for 100 patients; among these, the mean age was 35.1 ± 14.3 years (range: 15 - 74 years) with a median of 31 years. Seventeen records had missing or non-numeric age entries and were not imputed. The population was predominantly male (71.8%). Former patients accounted for 69.2% of the sample, new patients for 29.9%, and one record had missing patient-status information. After harmonizing spelling variants, all marital-status entries were coded as single. Most patients had no formal occupation or were unemployed (82.1%).

Using mutually exclusive categories derived from the consultation reason field, the most frequent reasons for consultation were aggressiveness/agitation (53.8%), psychotic or behavioral symptoms (27.4%), and withdrawal syndrome (13.7%). These characteristics are summarized in Table 1.

Table 1. Sociodemographic and clinical characteristics of the patients (N = 117).

Variables	Categories	n	%
Age, mean ± SD	35.1 ± 14.3; median 31; range 15 - 74	100	85.5
Age missing/non-numeric	Not imputed	17	14.5
Sex	Male	84	71.8
	Female	33	28.2
Patient status	Former	81	69.2
	New	35	29.9
	Missing	1	0.9
Marital status	Single (incl. spelling variants)	117	100.0
Occupation	No formal occupation/unemployed	96	82.1
	Student/pupil	16	13.7
	Employed/self-employed	5	4.3
Principal reason for consultation	Aggressiveness/Agitation	63	53.8
	Psychotic/behavioral symptoms	32	27.4
	Withdrawal	16	13.7
	Other	6	5.1

3.2. Urine Drug Test Results

The overall positivity rate of urine tests was 65.0% (76/117). The most frequently

detected substance category was benzodiazepines (46.2%; 54/117), of which 29.6% (16/54) were classified as linked to documented current benzodiazepine treatment and 70.4% (38/54) as not linked to documented benzodiazepine treatment. Cannabinoids (12.8%; 15/117) followed. Buprenorphine was detected in 5.1% (6/117), and isolated detections of oxycodone, methadone, and methamphetamine were observed. Because some results were combined positives, substance-category counts overlap. The distribution of the detected substances is presented in Figure 1.

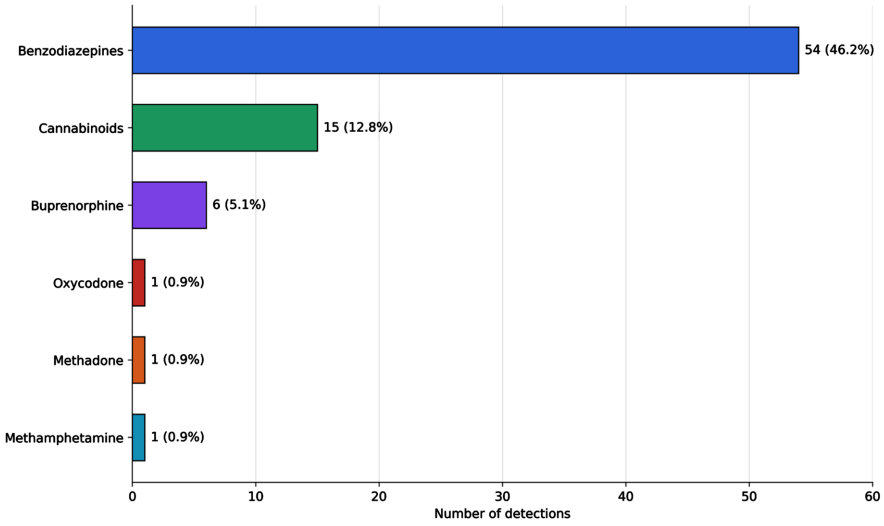

Figure 1. Distribution of substances detected in urine drug tests.

3.3. Distribution of Results by Sex and Patient Status

Women had a numerically higher positivity rate than men (75.8% vs. 60.7%), but this difference was not statistically significant ($\chi^2 = 0.23$; OR = 2.02; 95% CI: 0.82 - 5.02; p = 0.125). Positivity was also numerically higher among former patients than among new patients (69.1% vs. 57.1%), without statistical significance (OR = 1.68; 95% CI: 0.74 - 3.81; p = 0.212). These results are detailed in Table 2.

Table 2. Positivity rate by sex and patient status.

Variables	Categories	Positivity rate (%)	OR (95% CI); p-value
Sex	Male	60.7	2.02 (0.82 - 5.02); 0.125
	Female	75.8	
Patient status	Former	69.1	1.68 (0.74 - 3.81); 0.212
	New	57.1	

3.4. Associations between Positivity and Sociodemographic Variables

Univariate analyses using logistic regression for age and chi-square tests for categorical predictors showed:

- A negative age association with positivity (OR per year = 0.97; 95% CI: 0.94 -

1.00; p = 0.022; numeric age N = 100);

- No statistically significant association between previous patient status and positivity (OR = 1.68; 95% CI: 0.74 - 3.81; p = 0.212; N = 116);
- No statistically significant association between sex and positivity (female vs. male OR = 2.02; 95% CI: 0.82 - 5.02; p = 0.125).

These associations are summarized in Table 3 and illustrated in Figure 2.

Table 3. Univariate associations between urine test positivity and sociodemographic variables.

Predictor	Test/model	Effect estimate	p-value
Age	Logistic regression	OR per year = 0.97 (95% CI: 0.94 - 1.00)	0.022
Sex	Chi-square	Female vs. male OR = 2.02 (95% CI: 0.82 - 5.02)	0.125
Patient status	Chi-square	Former vs. new OR = 1.68 (95% CI: 0.74 - 3.81)	0.212

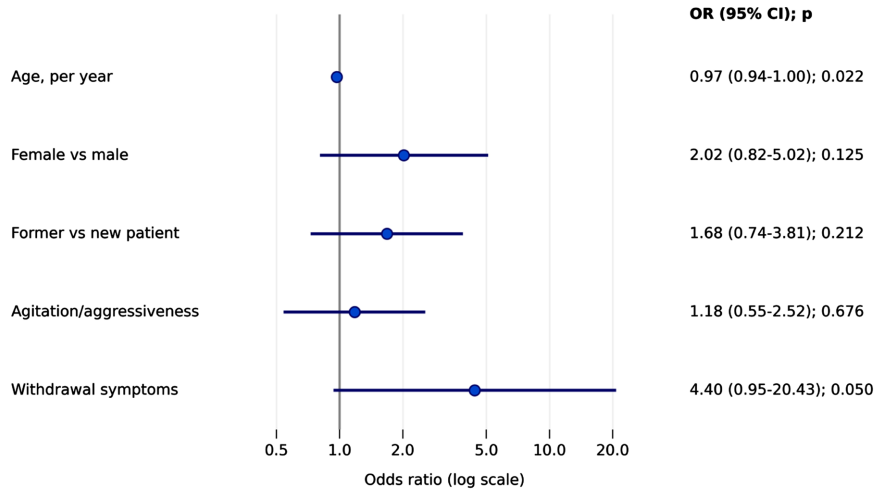

Figure 2. Univariate effect estimates for urine test positivity (forest plot).

3.5. Associations between Positivity and Clinical Variables

Agitation/aggressiveness was not statistically associated with positivity after chi-square testing (OR = 1.18; 95% CI: 0.55 - 2.52; p = 0.676). Withdrawal symptoms showed higher odds of positivity at the conventional threshold (OR = 4.40; 95% CI: 0.95 - 20.43; Fisher exact p = 0.050).

3.6. Associated Psychiatric Diagnosis

Among test-positive patients (N = 76), the most frequent psychiatric diagnosis categories were:

- Psychotic disorders (F20 - F29): 36 patients (47.4%),
- Substance-use disorders (F10F19): 28 patients (36.8%),
- Mood disorders (F30 - F34): 5 patients (6.6%),

- Personality disorders (F60 - F63): 1 patient (1.3%),
- Other diagnoses: 6 patients (7.9%).

The complete distribution of psychiatric diagnoses is presented in Table 4.

Table 4. Distribution of psychiatric diagnoses among test-positive patients (N = 76). All counts and percentages refer to this subgroup.

Principal diagnosis category (ICD-10) among positive patients	n	%
Psychotic disorders (F20 - F29)	36	47.4
Substance-use disorders (F10 - F19)	28	36.8
Mood disorders (F30 - F34)	5	6.6
Personality disorders (F60 - F63)	1	1.3
Other	6	7.9

4. Discussion

4.1. Study Limitations

This study has several limitations. First, the urine tests used did not detect certain substances commonly encountered in psychiatric settings, notably alcohol, tramadol, ketamine, solvents, synthetic psychostimulants (e.g., "boosters" or cathinones), and the majority of new psychoactive products (NPP), exposing a probable underestimation of actual consumption. Second, although the proportion of benzodiazepine positivity linked to documented treatment (29.6%) versus not linked (70.4%) was identified, this distinction does not entirely eliminate interpretive limitations: the absence of data on the exact delay between drug administration and sample collection, possible exposures before admission, and the pharmacokinetic variability of benzodiazepines do not allow positivity to be attributed with certainty to iatrogenic use or non-prescribed use. Third, certain clinical variables, including the intensity of agitation, detailed consumption history, and the exact delay between drug administration and urine collection, were incomplete, which may have reduced the robustness of certain statistical associations. Thus:

- The cross-sectional nature does not allow establishing a causal link between consumption and psychiatric disorder;
- Qualitative chromatographic screening does not quantify substance levels or poly-consumption;
- Clinical data rely partly on medical records whose precision varies by clinician.

However, the sample size (117 cases) and the use of chromatographic tests strengthen the internal consistency of this single-center dataset, although they do not establish national representativeness.

4.2. Sociodemographic and Clinical Profile of Test-Positive Patients

The typical profile suggested by the revised analyses is that of a young adult, often without formal employment, whose urine test reveals predominantly benzodiaz-

epine positivity. The classification as not linked to documented treatment suggests possible non-prescribed use or undocumented exposure, but the exact interpretation requires verification of prescription names, doses, and timing in the source medical records.

4.3. Main Substances Identified and Local Specificities

Benzodiazepines (46.2%) and cannabinoids (12.8%) dominated the detected substance categories. After replacing Pearson correlations with tests appropriate to the variable types, younger age remained associated with positivity, withdrawal symptoms showed borderline evidence of higher odds, and sex, previous patient status, and agitation/aggressiveness were not statistically significant. Psychotic disorders were the most frequent diagnosis category among positive patients, representing 47.4% of positive cases. The 65.0% positivity rate observed is close to the 69.2% lifetime substance-abuse prevalence reported among Nigerian psychiatric inpatients [6]. Comparisons with regional estimates should remain cautious because studies differ in sampling frame, substance detection window, and biological versus self-report measurement [7] [8]. These differences could be explained by the screening methodology (chromatographic tests here versus immunoenzymatic elsewhere) and by the clinical profile of patients managed at the CNSM

4.4. Misuse of Benzodiazepines and Contextual Factors

The predominance of benzodiazepines in this series is notable and contrasts with the African trend where cannabis remains the most consumed substance [7]-[8]. This result suggests non-prescribed use of psychotropic medications available in pharmacies without strict prescription, a phenomenon already described in several studies in West Africa [9]. Anxiolytic self-medication and prolonged prescriptions in psychiatry could also explain this strong presence. The numerical difference by former patient status was not statistically significant in the revised analysis (OR = 1.68; p = 0.212), so it should not be interpreted as evidence of persistent dependence despite psychiatric care. South African community psychiatry clinics have documented frequent long-term benzodiazepine prescribing as a contributing factor to dependence [11], and a Burkina Faso psychiatric-ward study supports the relevance of drug-use screening in West African psychiatric follow-up settings [12].

4.5. Vulnerability of Young Adults and Early Anchoring of Consumption

The logistic regression result for age (OR per year = 0.97; 95% CI: 0.94 - 1.00; p = 0.022) suggests higher positivity among younger patients in this sample, consistent with regional evidence that substance-use vulnerability often begins early in youth and young adulthood. Several studies conducted in general and university populations in East Africa confirm the early onset and normalization of psychoactive substance use among young people. Mutiso *et al.* [13] demonstrated,

within a large cohort of Kenyan students, a high prevalence of substance use associated with mental disorders, suggesting a bidirectional link between use and psychological distress. Concordantly, Atwoli *et al*. [14] had already reported that more than one in two students in Eldoret (Kenya) declared having experimented with at least one psychoactive substance, often in connection with academic stress and peer influence. These data thus underline the early anchoring of addictive behaviors in African educational contexts and their possible role as entry points toward subsequent psychiatric disorders, as also observed by Kiburi *et al*. [15]. These observations reinforce the need for prevention and screening programs targeted at young psychiatric patients at the beginning of their therapeutic journey.

4.6. Global Complexification of Addictions

The recent evolution of consumption profiles on a global scale reflects a progressive shift toward more complex and polymorphic forms of addiction. Volkow and Blanco [16] underlined that the opioid crisis, initially confined to Western contexts, illustrates the multifactorial dynamics of the addictive phenomenon, where biological, psychological, and social vulnerabilities interact closely. These authors insist on the need to approach dependence as a chronic brain disease, integrating the dimension of associated psychiatric disorders. This neurobiological and systemic approach to addiction finds a particular resonance in the African psychiatric context, where patients frequently present multiple comorbidities requiring integrated care.

4.7. Psychosis-Addiction Comorbidity

The proportion of psychotic disorders among positive patients (47.4%) is compatible with a clinically important psychosis-addiction overlap, but the cross-sectional design cannot determine directionality. According to Buckley [17], PAS use can precipitate an acute psychotic episode in vulnerable subjects, while in schizophrenic patients, it can exacerbate positive symptoms, compromise adherence, and increase relapse risks. However, the study does not allow determining whether consumption precedes psychosis. This link is also documented in European studies [18] [19], but rarely analyzed in African contexts where biological diagnosis remains poorly systematized.

4.8. Sociological Dimensions and Gender

These results reflect a dual problem: on one hand, pharmacological iatrogenic dependence (benzodiazepines) linked to the growing medicalization of anxiety and sleep disorders; on the other hand, the psychosocial vulnerability of young people, favoring recourse to psychoactive substances as a coping strategy against stress or isolation. The sociological profile observed, young adults, unemployed, single, reflects the social disaffiliation frequently associated with PAS use in African urban contexts [20]. The higher numerical positivity rate among women (75.8%) should be interpreted cautiously because sex was not statistically associated with positiv-

ity (p = 0.125). Rather than implying a sex-specific risk, this finding may reflect sampling, treatment exposure, or undocumented medication use and should be explored in a study designed for gender-stratified analysis. Recent regional data reinforce the need for objective screening and medication-exposure documentation: a Benin psychiatric-consultation study showed that urine testing identified recent psychoactive substance use more often than self-report [10], South African community psychiatry clinics documented frequent long-term benzodiazepine prescribing [11], and a Burkina Faso psychiatric-ward study supports the relevance of drug-use screening in West African psychiatric follow-up settings [12].

5. Conclusions

This single-center cross-sectional study at the CNSM of Libreville indicates that psychoactive-substance use is a frequent finding among psychiatric patients undergoing consecutive urine screening. Benzodiazepines and cannabinoids were the dominant detected categories, and a substantial proportion of benzodiazepine-positive results appeared unrelated to documented current treatment, suggesting possible non-prescribed or undocumented exposure in this clinical population.

Exploratory univariate analyses identified younger age as an associated factor and withdrawal symptoms as showing borderline evidence of higher odds of positivity, whereas sex, previous patient status, and agitation/aggressiveness were not statistically significant. Among test-positive patients, psychotic disorders were the most frequent diagnostic category, highlighting the close overlap between severe psychiatric presentations and substance use in this setting.

These findings support strengthening systematic urine screening, improving prescription documentation, and fostering integrated collaboration between psychiatry and addiction medicine at the CNSM. Because the design was cross-sectional and single-center, the results should be interpreted as associative rather than causal and cannot be generalized nationally without confirmation in larger prospective multicenter studies. Future investigations should also systematically record care setting and broaden biological screening to better characterize substance-use profiles in Gabonese psychiatric practice.

Authors' Contributions

Dope Koumou R.: Conceptualization, Methodology, Investigation, Data Curation, Project Administration, Writing, Original Draft.

Abessolo Ondo 1er T.S.: Investigation, Resources, Formal Analysis, Software (Python statistical pipeline), Visualization (figures and effect-estimate plot).

Traoré B. S.: Supervision, Conceptualization, Writing, Review & Editing.

Goncé D. A.: Formal Analysis, Methodology (statistical supervision), Visualization.

Moussavou I.: Investigation, Resources (clinical setting and biological sampling at the CNSM).

Mboussou M.: Supervision, Conceptualization, Writing, Review & Editing.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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