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Demographic and Histopathological Profile of Skin Biopsies at a Private Laboratory in Abuja, Nigeria: A 10-Year Retrospective Study

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ABSTRACT

Introduction: *Skin diseases contribute substantially to global morbidity, but long-term data describing histopathological patterns in private healthcare settings in sub-Saharan Africa remain limited. This study assessed the demographic, anatomical, procedural, and histopathological characteristics of skin biopsy specimens processed over 10 years in a private diagnostic laboratory in Abuja, Nigeria.*

Methods: *A retrospective cross-sectional descriptive study was conducted using 2,016 consecutive skin biopsy records retrieved from laboratory archives over a 10-year period from January 2016 to December 2025. Data extracted included age group, sex, anatomical biopsy site, biopsy procedure, and histopathological diagnosis. Data were summarized using descriptive statistics, with frequencies and percentages used to describe distributions and cross-tabulations by sex and age group.*

Results: *Females accounted for 54.9% (n = 1,106) of specimens, while the 30–49-year age group was most represented (27.8%, n = 560). The lower limb was the most frequently documented anatomical site (13.6%, n = 275), although the biopsy site was not stated in 30.1% of records. Punch biopsy was the most frequently documented specific procedure (16.8%, n = 339). Benign lesions predominated, accounting for 97.3% (n = 1,961) of specimens, compared with 2.7% (n = 55) classified as malignant. Inflammatory/eczematous dermatoses were the most frequent histopathological category (33.3%, n = 672), followed by lichenoid/interface dermatoses (16.7%, n = 336) and cystic lesions (11.4%, n = 229). Neoplastic lesions accounted for 2.0% (n = 41) of specimens and were predominantly malignant.*

Conclusion: *Skin biopsy specimens processed in this private laboratory were predominantly benign and characterized by inflammatory and other non-neoplastic dermatoses, with a substantial representation among young and middle-aged adults. The high proportion of incomplete documentation highlights the need for standardized pathology request forms and improved clinical information accompanying biopsy specimens. Strengthening collaboration between private and public healthcare sectors could enhance dermatopathological surveillance and improve understanding of skin disease patterns in Nigeria.*

Keywords: *Dermatopathology, Histopathology, Inflammatory dermatoses, Nigeria, retrospective study, Skin biopsy, Skin neoplasms.*

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Introduction

Skin diseases constitute a substantial global public health burden, contributing significantly to morbidity and the demand for dermatological services {1}. In sub-Saharan Africa, accurately characterizing this burden remains challenging because of socioeconomic disparities, environmental factors, and limited access to specialized dermatological and dermatopathological services {2,3}.

Although many dermatological conditions can be diagnosed and managed clinically, histopathological examination remains essential for definitive diagnosis, particularly in neoplastic, autoimmune, and clinically atypical inflammatory disorders {4}. Studies from Nigeria indicate that non-infectious inflammatory dermatoses, particularly eczematous conditions, constitute a substantial proportion of skin biopsy diagnoses, alongside a spectrum of benign and malignant neoplasms {5}. However, long-term institutional data from rapidly urbanizing centres such as Abuja remain limited. Characterizing these patterns is important for informing local diagnostic services, healthcare planning, and appropriate allocation of dermatological resources.

Materials and Methods

This was a retrospective, cross-sectional descriptive study of histopathological records from a private pathology laboratory in Abuja, Nigeria, covering 10 years from January 2016 to December 2025. A total of 2,016 consecutive skin biopsy records meeting the study eligibility criteria and with retrievable relevant data were included.

Data were extracted from the laboratory information system and archived pathology records. Variables included age group and sex, anatomical site of the skin biopsy, tissue acquisition method or biopsy procedure, including punch biopsy, excisional biopsy, and lesion or tissue excision, and histopathological findings, classified into standardized diagnostic regroupings, including inflammatory/eczematous dermatoses, lichenoid/interface dermatoses, cystic lesions, benign fibroepithelial/fibrohistiocytic lesions, and neoplastic lesions.

Data were analyzed using descriptive statistics. Frequencies (n) and percentages (%) were calculated to summarize the distribution of specimens according to demographic characteristics, anatomical site, biopsy procedure, and histopathological diagnosis. Histopathological diagnoses were further cross-tabulated by sex and age group to assess their distribution across demographic categories.

Results

A total of 2,016 skin biopsy specimens were reviewed over the 10-year study period. Females accounted for 1,106 specimens (54.9%), males for 845 (41.9%), while sex was not specified in 65 specimens (3.2%) (Table 1). The largest age group was 30–49 years (560, 27.8%), followed by adults with unspecified age (430, 21.3%) and those aged 10–29 years (388, 19.2%). Specimens from the 50–69-year age group accounted for 16.1%, whereas those from individuals aged ≥70 years constituted 2.3% (Figure 1).

Table 1: Distribution of Skin Biopsy Specimens by Sex (N = 2,016)

Sex Category	Frequency (n)	Percentage (%)
Female	1,106	54.9
Male	845	41.9
Not specified	65	3.2
Total	**2,016**	**100.0**

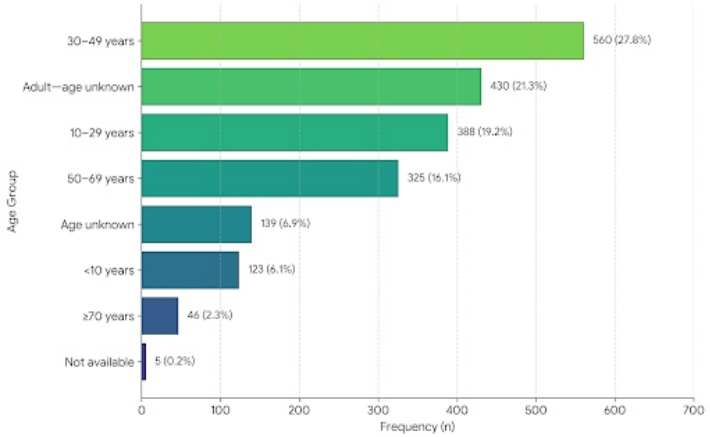

Figure 1. Age Distribution of Skin Biopsy Specimens (N = 2,016)

Anatomical site was not documented in 606 specimens (30.1%). Among specimens with a recorded site, the lower limb was the most frequently represented location (275, 13.6%), followed by the upper limb (199, 9.9%), multiple sites (187, 9.3%), face (135, 6.7%), and scalp (134, 6.6%). The flank/loin was the least frequently represented site (1, 0.1%) (Figure 2).

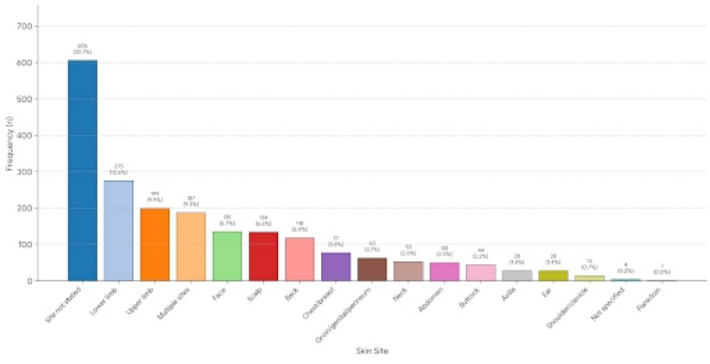

Figure 2. Distribution of skin biopsies according to anatomical site (N = 2,016)

Regarding biopsy procedures, generic descriptions of skin biopsy (31.0%) and tissue (22.8%) accounted for more than half of all submissions. Among specifically identified techniques, punch biopsy was the most frequent (339, 16.8%), followed by lesion/mass/cyst sampling (317, 15.7%) and excisional biopsy/excision (108, 5.4%). Other procedures, including lumpectomy, incisional biopsy, wound/ulcer biopsy, and ablation/cauterisation, each accounted for less than 1% of specimens (Figure 3)

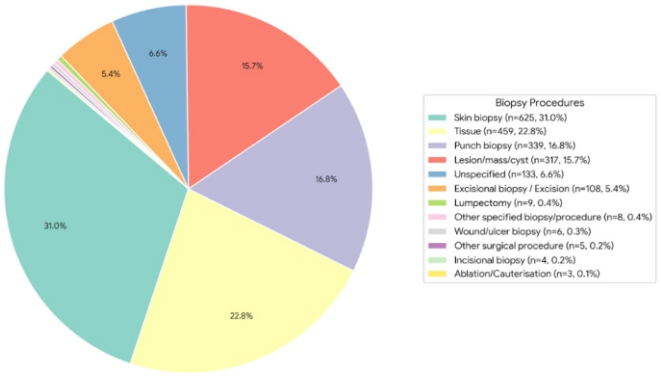

Figure 3. Distribution of skin biopsy procedures (N = 2,016)

Histopathological examination demonstrated a predominance of benign lesions (1,961, 97.3%), while 55 specimens (2.7%) were classified as malignant (Table 2). Inflammatory/eczematous dermatoses were the most frequent diagnostic group (672, 33.3%), followed by lichenoid/interface dermatoses (336, 16.7%), cystic lesions (229, 11.4%), and psoriasiform/psoriatic disorders (190, 9.4%). Benign fibroepithelial/fibrohistiocytic lesions accounted for 166 specimens (8.2%). Neoplastic lesions comprised 41 specimens (2.0%), including 40 malignant and one benign lesion, while follicular/adnexal disorders and tumours accounted for 26 specimens (1.3%), including three malignant lesions.

Table 2: Histopathological Classification and Distribution of Skin Biopsy Findings (N = 2,016)

Histology Regroup	Benign, (n)	Malignant, (n)	Total, (n)	Percentage (%)
Follicular / Adnexal Disorders & Tumours	23	3	26	1.29
Neoplastic Lesions	1	40	41	2.03
Vascular / Haematolymphoid Lesions	43	0	43	2.13
Keratinocytic / Keratotic Lesions	62	0	62	3.08
Verrucous / Viral Lesions	72	0	72	3.57
Melanocytic / Pigmentary Lesions	88	0	88	4.37
Granulomatous / Reactive / Scar Lesions	91	0	91	4.51
Benign Fibroepithelial / Fibrohistiocytic Lesions	166	0	166	8.23
Psoriasiform / Psoriatic Disorders	190	0	190	9.42
Cystic Lesions	229	0	229	11.36
Lichenoid / Interface Dermatoses	336	0	336	16.67
Inflammatory / Eczematous Dermatoses	660	12	672	33.33
Total	**1,961**	**55**	**2,016**	**100.00**

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The sex-stratified analysis showed a female predominance across most major histological categories (Table 3). Inflammatory/eczematous dermatoses were the most common diagnosis among both female and male specimens, occurring in 386 female and 258 male specimens. Lichenoid/interface dermatoses were also more frequent among female specimens (195 versus 136), as were cystic lesions (129 versus 93) and benign fibroepithelial/fibrohistiocytic lesions (93 versus 68). Psoriasiform/psoriatic disorders showed an almost equal distribution between female and male specimens (92 versus 94). Neoplastic lesions were similarly distributed between female (22) and male (19) specimens.

Table 3: Distribution of Histological Diagnoses by sex

Histological Diagnosis	N/S	Female(n)	Male	(n) Total(n)	Percentage (%)
Inflammatory / Eczematous Dermatoses	28	386	258	**672**	**33.3**
ALichenoid / Interface Dermatoses	5	195	136	**336**	**16.7**
Cystic Lesions	7	129	93	**229**	**11.4**
Psoriasiform / Psoriatic Disorders	4	92	94	**190**	**9.4**
Benign Fibroepithelial / Fibrohistiocytic Lesions	5	93	68	**166**	**8.2**
Granulomatous / Reactive / Scar Lesions	5	54	32	**91**	**4.5**
Melanocytic / Pigmentary Lesions	2	46	40	**88**	**4.4**
Verrucous / Viral Lesions	5	30	37	**72**	**3.6**
Keratinocytic / Keratotic Lesions	2	22	38	**62**	**3.1**
Vascular / Haematolymphoid Lesions	2	22	19	**43**	**2.1**
Malignant / Neoplastic Lesions	0	22	19	**41**	**2.0**
Follicular / Adnexal Disorders & Tumours	0	15	11	**26**	**1.3**
Total	**65**	**1,106**	**845**	**2,016**	**100.0**

Age-stratified analysis demonstrated that inflammatory/eczematous dermatoses were concentrated in young and middle-aged adults, with the highest frequencies among the 30–49-year (169) and 10–29-year (140) groups (Figure 4). Lichenoid/interface dermatoses and cystic lesions showed a similar predominance among younger and middle-aged adults. Neoplastic lesions occurred predominantly in adult and older age groups, with the highest frequencies among the 30–49-year (15), 50–69-year (11), and ≥70-year (8) groups. Overall, the histopathological profile was dominated by benign inflammatory and non-neoplastic conditions, with malignant lesions constituting a relatively small proportion of the biopsy specimens.

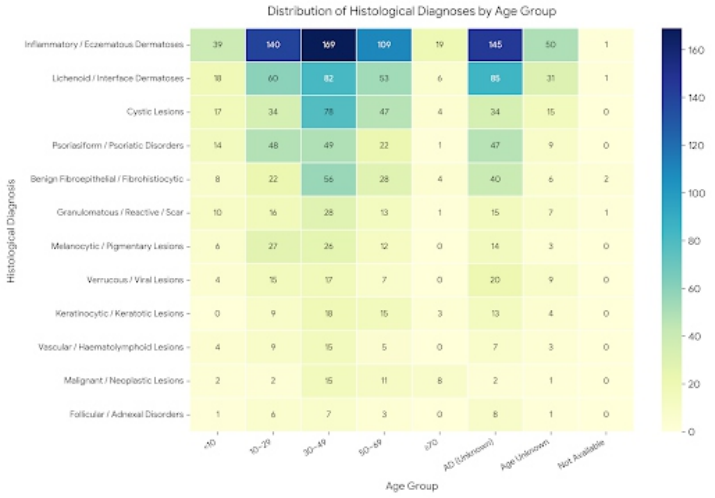

Figure 4: Distribution of Histological Diagnoses by Age Group

Heatmap representing the Distribution of Histological Diagnoses by Age Group.
Each cell displays the exact frequency value with clear axis labels, a sequential colour gradient (where darker shades indicate higher frequencies), and gridlines for enhanced legibility:

Discussion

This 10-year retrospective study of 2,016 skin biopsy specimens provides useful insight into the demographic, procedural, anatomical, and histopathological patterns of skin disease encountered in a private diagnostic laboratory in Abuja, Nigeria. Skin disorders constitute a substantial global health burden, with considerable effects on morbidity and quality of life {1}. Long-term institutional data are therefore valuable for characterizing local disease patterns, identifying diagnostic-service gaps, and informing resource allocation, particularly in settings where dermatopathological data remain limited.

Females accounted for 54.9% of the specimens, compared with 41.9% from males. This female predominance is broadly consistent with findings from several Nigerian dermatological studies. A prospective study from Benin City reported that females constituted 53.1% of patients, while the Calabar experience reported a male-to-female ratio of 1:1.5 {3,6}. Differences in healthcare-seeking behaviour, greater concern regarding visible skin lesions, and the distribution of inflammatory and other disorders for which women may be more likely to seek specialist care could partly explain this pattern. However, because the present study examined laboratory submissions rather than population-based prevalence, the observed sex distribution may also reflect referral and biopsy practices.

The 30–49-year age group constituted the largest proportion of specimens (27.8%), followed by those aged 10–29 years (19.2%).

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This substantial representation of young and middle-aged adults is consistent with Nigerian studies showing that a large proportion of dermatological morbidity occurs in younger age groups{3,7,8}. In the Benin City study, more than two-thirds of patients were younger than 40 years, while the Kaduna study reported that approximately three-quarters were younger than 40 years {3, 7}. The relatively low proportions of specimens from children aged <10 years (6.1%) and adults aged ≥70 years (2.3%) should not necessarily be interpreted as lower disease prevalence. Differences in referral patterns, clinical diagnosis without biopsy, healthcare-seeking behaviour, and disease spectrum may account for the lower representation of these age groups.

An important finding was the substantial proportion of specimens with incomplete anatomical and procedural documentation. The anatomical site was not stated in 30.1% of records, while 31.0% were submitted simply as "skin biopsy" and 22.8% as "tissue." Such nonspecific descriptions limit meaningful clinicopathological correlation and reduce the epidemiological value of laboratory databases. This is particularly important in dermatopathology because interpretation often depends on the anatomical location, clinical morphology, duration, and suspected diagnosis. A recent two-centre Nigerian study demonstrated the importance of clinicopathological correlation in skin disease diagnosis and further supports the need for complete clinical information on pathology request forms {9}. Standardized requisition forms with mandatory fields for anatomical site, clinical diagnosis, age, and sex could substantially improve diagnostic communication and future retrospective audits.

Among the documented anatomical sites, the lower limb was the most frequent (13.6%), followed by the upper limb (9.9%). The predominance of the extremities may reflect the occurrence of chronic inflammatory, ulcerative, traumatic, and neoplastic lesions in these regions. This is also relevant to Nigerian studies of cutaneous malignancies, in which the lower limb has been identified as an important site of malignant skin lesions {10,11}. However, the high proportion of specimens without documented anatomical sites limits direct comparison with other series and emphasizes the need for improved documentation.

Punch biopsy was the most frequently documented specific biopsy procedure (16.8%). This is consistent with its established role in dermatopathology as a relatively simple and minimally invasive method of obtaining representative full-thickness skin tissue {12}. Punch biopsy is particularly useful for many inflammatory dermatoses and selected neoplastic lesions because it permits assessment of epidermal and dermal architecture. Nevertheless, optimal diagnostic yield depends on appropriate lesion selection, biopsy depth, and communication of the clinical differential diagnosis {13}. The relatively high proportion of nonspecific procedural descriptions in this study therefore represents an important area for improvement in clinical documentation and specimen submission practices.

The histopathological spectrum was dominated by non-neoplastic inflammatory disorders. Inflammatory/eczematous dermatoses constituted 33.3% of all specimens, while lichenoid/interface dermatoses accounted for 16.7%, together, these categories represented approximately half of the study specimens. This predominance is consistent with the broader Nigerian dermatological literature, in which eczematous and other inflammatory dermatoses constitute a major proportion of dermatological morbidity{3,7,8}.

The Kaduna study, for example, reported eczematous dermatitis as the most common dermatological disorder, accounting for 35% of cases, while eczematous dermatitis was also the leading diagnosis in the Benin City series{3,7}.

Cystic lesions (11.4%) and psoriasiform/psoriatic disorders (9.4%) were other important diagnostic categories. Their relatively high representation demonstrates that skin biopsy services are used not only for suspected malignancy but also for benign and inflammatory conditions in which clinical diagnosis may be uncertain. Histopathological examination remains particularly valuable in such circumstances because clinically similar lesions may have different pathological diagnoses and management implications{13}.

Neoplastic lesions accounted for 2.0% of the specimens in the corresponding histological category, although 40 of the 41 lesions in this category were malignant. When malignant classifications occurring within other regroupings are also considered, the overall number of malignant specimens was 55 (2.7%). This distinction is important when interpreting the malignant burden of the dataset. Nigerian studies have documented a broad spectrum of cutaneous malignancies, including squamous cell carcinoma, Kaposi sarcoma, melanoma, basal cell carcinoma, and dermatofibrosarcoma protuberans {10,11,14}.

The relatively small proportion of malignant specimens in this private laboratory series should not be interpreted as evidence of a low population burden of skin cancer. It may instead reflect the referral profile of the laboratory, with patients with clinically suspected or advanced malignancies more likely to be managed or investigated in tertiary hospitals and specialist oncology centres. In the University of Calabar Teaching Hospital, for example, 162 cases of major dermatological malignancies were documented over the study period, with squamous cell carcinoma and Kaposi sarcoma among the leading diagnoses {11}. Similarly, a study from Benin City demonstrated a diverse spectrum of malignant skin tumours requiring histopathological diagnosis {14}.

Age stratification showed that malignant/neoplastic lesions were concentrated among adults aged ≥30 years, with the highest frequencies in the 30–49-, 50–69-, and ≥70-year groups. This pattern is consistent with the generally increasing risk of cutaneous malignancy with advancing age and cumulative exposure to environmental risk factors. The distribution of skin malignancies also varies according to pigmentation, anatomical site, environmental exposure, and socioeconomic factors {10,11,14}. The relatively small number of malignant specimens in the present study, however, precludes more detailed age-specific inference.

The predominance of inflammatory and benign lesions in this series has important implications for dermatopathology practice in Nigeria. Although malignancy constitutes an important component of skin biopsy services, the majority of specimens in this private laboratory were submitted for evaluation of inflammatory, cystic, psoriasiform, and other non-neoplastic conditions. This pattern reinforces the continuing importance of dermatopathology expertise in differentiating clinically overlapping inflammatory dermatoses and in providing definitive diagnoses when clinical assessment is inconclusive.

Overall, the findings demonstrate a predominantly benign and inflammatory histopathological spectrum, with substantial representation among young and middle-aged adults and a modest proportion of malignant specimens.

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The high frequency of incomplete anatomical and procedural documentation represents an important quality-improvement opportunity. Standardization of pathology request forms, improved clinician–pathologist communication, appropriate biopsy selection, and integration of private-sector laboratory data with public-sector dermatological surveillance could strengthen the quality and epidemiological usefulness of dermatopathology services in Nigeria.

The study's strengths include its large sample size (N = 2,016) and 10-year study period. However, its retrospective design resulted in incomplete documentation, while the absence of clinical and follow-up data limited clinicopathological correlation. Despite these limitations, the study provides a useful baseline for characterizing skin biopsy patterns and strengthening dermatopathology surveillance in Nigeria's private healthcare sector.

This study has several limitations. The retrospective design and reliance on laboratory records resulted in incomplete documentation, particularly for anatomical sites and biopsy procedures. The absence of clinical information, including presenting features, clinical diagnoses, treatment, and follow-up, limited clinicopathological correlation. As the study was conducted in a single private A laboratory in an urban setting, the findings may not be generalizable to public-sector facilities or rural populations and may be influenced by referral patterns. Finally, the dataset represented biopsy episodes rather than longitudinal patient follow-up, precluding assessment of individual disease trajectories and treatment outcomes.

Conclusion

This 10-year retrospective analysis establishes a baseline profile of dermatological conditions managed within a private laboratory setting in Abuja, Nigeria. The findings reveal a high burden of non-infectious inflammatory and eczematous dermatoses predominantly affecting young adults, with a notable female healthcare-seeking preponderance. While limitations such as retrospective missing data and private-sector referral biases exist, the study underscores the indispensable role of histopathology in definitive dermatological diagnosis. Improving clinical documentation on requisition forms and fostering integrated health data networks will be vital for optimizing future patient care, resource allocation, and dermatological disease surveillance in Nigeria.

Recommendations

Histopathology request forms should be standardized with mandatory fields for anatomical site, age, sex, and clinical diagnosis to improve documentation and clinicopathological correlation. Continuous training should promote appropriate biopsy techniques and complete clinical information. Public–private data collaboration should be strengthened to improve national dermatopathology surveillance. Future prospective studies should incorporate clinical correlation, treatment monitoring, and patient outcomes to better define the clinical and socioeconomic burden of skin disease in Nigeria.

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Conflict of interest and disclosures

There was no conflict of interest.

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