Prevalence of Common Skin Diseases in Cambodian Public Health Facilities: A 5-Year Study (2018-2022)

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Abstract

Skin diseases affect nearly 30% of the global population. These conditions significantly impact emotional and physical well-being, highlighting the need for better management and care. However, there is limited research and a lack of detailed information regarding the characteristics of common skin conditions in Cambodia. This study period (2018-2022) aims to assess the prevalence of the most common skin diseases in outpatient wards across Cambodia and its regions. Data on skin disease cases were obtained from the Health Management Information System (HMIS), managed by the Ministry of Health. Data was processed using Excel 2019, and geographic mapping was done with Geographic Information System (GIS) 3.x. 1,366,339 skin disease cases, ranging from 0 days to those over 65 years, were reported over five years. The highest prevalence per 1,000,000 from 2018 to 2022 was observed for "other disorders of skin and subcutaneous tissue" (7390, 6540, 6610, 4940, and 4720), followed by pruritus (5400, 5280, 5480, 4260, and 4450) and urticaria (2540, 2210, 2310, 1880, and 1880). The age group with the highest prevalence was 0 to 28 days. Regionally, the Plain region had the highest number of cases (46.35%) of the total number during the study period. While the Tonle Sap Lake region reported the highest cases of skin disorders and pruritus, whereas the Plateau and Mountainous region exhibited a higher male-to-female ratio (M/F = 1.28) compared to other regions (M/F ~0.78–0.80). Despite the high disease burden, Cambodia faces a critical shortage of dermatologists, with only 18 specialists available nationwide, most concentrated in the Plain region. The lack of specialized care and limited diagnostic facilities contribute to the underdiagnosis and misclassification of skin diseases.

Keywords**:** *Prevalence, the most common skin diseases, governmental hospital, Cambodia*

1. Introduction

Skin diseases are in the top 4 of all human diseases and injuries, affecting almost 30% of the world population. The chronicity of skin diseases have emotional, physical impacts, influencing daily activities, quality of life, and well-being, premature death or lower life expectancy, and increased health expenditure on millions of people worldwide (Flohr & Hay, 2021; Lim et al., 2017). However, many developing countries ignore the weight of skin diseases. This may be due to those countries' lack of health facilities, human resources, and treatment guidelines.

In a study conducted in 2013, skin diseases were the most common cause of global burden among 306 diseases and injuries. The study highlighted fifteen cutaneous problems, such as dermatitis 0.38% while acne (0.29%), psoriasis (0.19%), urticaria (0.19%), viral and fungal skin infections (with 0.16% and 0.15%), scabies (0.07%), melanoma (0.06%), pyoderma (0.05%), cellulitis (0.04%), keratinocyte carcinoma and decubitus ulcers (each at 0.03%), alopecia areata (0.01%), and 0.12 percent for other skin and subcutaneous diseases were also reported as common skin problems (Karimkhani et al., 2017).

In 2010, skin condition ranged among the top 10 diseases (Hay et al., 2014). The impact of skin disease was very high. However, these remain less of a consideration in national or global health deliberation. Moreover, skin conditions were confirmed in the four prominent sources of nonfatal problems expressed as years lost due to disability in 2010 and raised the 18th cause of health burden (Hay et al., 2014).

The National Institute of Health report estimated that the explanation on skin diseases in 2022 was about 3.6 billion (Research Portfolio Online Reporting Tools, n.d.). The report from Our World in Data in

2019 stated that skin diseases stand in the top 19 of the health problems and cost 42.88 billion, equal to 1.68% of the total disease burden by cause (Our World in Data, n.d.). A study conducted in 2013 showed dermatitis alone cost 9.3 million dollars (Karimkhani et al., 2017).

Some patients with chronic dermatological diseases like psoriasis and atopic dermatitis suffer from social stigmatization and low self-esteem (Seth et al., 2017). A large-scale study in 13 European countries had mentioned the association between skin diseases with psychological disorders like depression, anxiety, and suicidal ideation (Dalgard et al., 2015). Clinical anxiety is the highest association, followed by depression and suicidal ideation with psoriasis, atopic dermatitis, hand eczema, and leg ulcers (Dalgard et al., 2015). Moreover, vitiligo, acne, and eczema were reported to have the highest impact on the psychosocial well-being of patients of younger ages, single and low-income, and patients with prolonged duration (Ahmed et al., 2013).

In the ASEAN nations, a study from Singapore confirmed updated data regarding the problem of the skin diseases. Burden among elderly patients was the most common, and associated skin problems were dermatitis, viral skin infection, and fungal infection. The three most prevalent dermatoses across all ages were dermatitis, acne vulgaris, and viral skin infections (Yew et al., 2022). On the other hand, a study on emergency skin diseases in children was conducted in Thailand from 1 Jan 2016 to Dec 2019 at the Srinagarind Hospital, Faculty of Medicine, Khon Kaen University, Thailand, by Techasatian et al. (2021) It showed that the most common emergency pediatric skin problems were anaphylaxis, urticaria, eczema, drug eruption, and others (Techasatian et al., 2021).

In order to better understand skin conditions in Cambodia, the terminology "((Prevalence) AND (skin diseases)) AND (Cambodia)" were used to explore relevant studies in PubMed and Google Scholar. After searching, there are fewer relevant studies in dermatology within ASEAN countries and Cambodia. There were 17 articles that had been studied about skin diseases in Cambodia. The understanding of skin diseases in Cambodia was limited. Cambodia is a lower middle-income country located in Southeast Asia, with around 15.6 million people according to March 2019 data (The Ministry of Health, 2022). Cambodia has one capital city, 25 provinces, 183 districts, 1,609 communes, and 13,406 villages. The capital city of Cambodia is Phnom Penh, which is also the largest city in the country. Cambodia is known for its rich history, stunning temples, and beautiful landscapes (Nelsen et al., 2021). Cambodia has four distinct natural regions (National Institute of Statistics Ministry of Planning, 2019). Among them, the plains region has always been the most densely populated in the country, followed by first, the Tonle Sap Region (TSR): Banteay Meanchey, Battambang, Kampong Chhnang, Kampong Thom, Pursat, Siem Reap, Otdar Meanchey, and Pailin Provinces. Second, the Coastal and Sea Region (CSR): Koh Kong, Preah Sihanouk, Kampot, Kep Province. Third, the Plateau and Mountains Region (PMR): Kampong Speu, Kratie, Mondul Kiri, Preah Vihear, Ratanak Kiri, and Stung Treng Province. The last, the Central Plain Region (CPR): Kampong Cham, Tbong Khmum, Kandal, Phnom Penh, Prey Veng, Svay Rieng, and Takeo Province.

The features of prevalent skin disorders in Cambodia are not well documented, and there is a lack of comprehensive research on the subject. To address this gap, we propose conducting a study to gain a deeper understanding of the prevalence and distribution of skin diseases in the country. This research aims to highlight the urgent need for greater attention from the government and healthcare authorities to support dermatological patients. The findings of our study will be instrumental in raising awareness among stakeholders in Cambodia about the impact of skin diseases on the community and in developing more effective strategies and resource allocations to enhance dermatological care and management nationwide.

2. Objective

To evaluate the prevalence and distribution of common skin diseases in the outpatient wards of Cambodian government health facilities from 2018 to 2022, analyze trends across different regions of the country.

3. Materials and Methods

The research question is intended according to the PICO(T) criteria (Population, Intervention, Comparing, Outcome and Timing). As the data on how the burden of skin diseases impacts the Cambodian population has not been well-identified, we aim to provide detailed information through a thorough descriptive study.

The prevalence of skin illnesses will measure the occurrence of skin problems in the Cambodian population and help the policymakers in planning health services for the community. The skin problem in different provinces will share the overall burden of skin diseases, emphasizing the necessity of integrated national and subnational strategies to close the disparity in health outcomes. For health estimates to be more accurate and helpful in addressing health inequalities, data quality, availability, and dependability at the provincial level must be improved. The majority of therapies should target the dermatoses that are most prevalent in each location.

HMIS is a web-based system developed by the Department of Health Information System and Planning, Ministry of Health, Cambodia. The web-based system currently records data on all types of health conditions among the Cambodian population from 1518 public health facilities, while Cambodia had 1661 health facilities in 2022. Diseases are reported as case numbers. All skin diseases case reported in the HMIS web-based system will be extracted, including ICD-10 codes, provinces, types of skin diseases, gender, and age group into an Excel file. All cases of skin diseases will be included in this study. Then, the skin disorders will be categorized using ICD-10 under the following headings: neoplasm (C00–C97), skin and subcutaneous tissue (L00–L99), Tuberculosis (A15-A19), and specific infection and parasite diseases (A00–B99) (table 3.3) (WHO, 2019). Country profile, population, age group, gender, residential area, and the frequency of skin diseases will be mentioned in this study. The group of age will follow according to the Cambodian Ministry of Health data set in the web-based HMIS.

The study excluded 143 health facilities due to technical difficulties in new settings, internet connection, computers, and human resources. Also, 16,185 private sectors were not reported on the web-based because of the limitation of resources. There were 15,054 consultation rooms, of which 56 were for dermatology consultation, and 1,131 private clinics (there were no private clinics working specifically on dermatological diseases until the time of our report) that have not been reported to the web yet. The last updated number of NGOs that work and provide health care services is 49 (DIC/MoH, 2024). They provide reproductive field, medical services, ophthalmology, and dental care services.

The researcher started with an abstract and title search in the search window and screen-read the articles' abstracts after the filters were used. The prevalence of skin diseases and the burden of skin diseases globally, in ASEAN countries, and in Cambodia will be collected over the last 10 years. The terminology to search "((Prevalence) AND (skin diseases)) AND (Cambodia) Filters: in the last 10 years " and ((Prevalence) AND (skin diseases)) AND (ASEAN countries) Filters: in the last 10 years, they were used to explore the relevant studies in PubMed. A country with observer status, like Timor Leste, was not included in the search.

To access the web-based, the researchers were given approval from the Ministry of Health, Cambodia. After approval from the MoH, the researchers were required to ask the assistant from the Department of Information and Planning (DPHI) to access the web-based. The collection process was assisted by a DPHI staff member. Because the Ministry of Health does not allow guest users to access HMIS.

From the HMIS, the data were collected on ICD-10 number, number of patients, diagnosis, sex, age group, and residential area. Currently, the HMIS does not record patient history, association factors, names and surnames of the patients, or other patient identity. HMIS reports only the case number of the patients, age group, gender, and residential area in each health indication that is set by the Ministry of Health. After collecting data from the HMIS, the data were stored in an Excel file. All the information was kept in confidentiality all the time. The authors did not allow anyone else to access or use this data. The confidentiality and privacy were ensured.

This study will be conducted by repeated descriptive retrospective studies designed to describe the prevalence of skin diseases in Cambodia. The social demographic characteristic variables will be categorized by gender, age group, and residential area. Each year, the prevalence of skin diseases will be calculated in

this study and classified by provinces, regions, and the whole country. A ranking of the top 10 skin diseases will be prepared from 2018 to 2022. The overall prevalence for the whole country will be presented as Prevalence (P). This prevalence will be the total number of cases of skin diseases in each year (numerator) divided by the total population in each year (denominator). The prevalence for the four regions will present as P(TSR) for the Tonle Sap region, P(CSR) for the Coastal and Sea region, P(PMR) for the Plateau and Mountains region, and P(CPR) for the Central Plant region, respectively.

4. Results and Discussion

A total of 1,366,339 skin disease cases, ranging from 0 days to over 65 years, were obtained from the HMIS over five years. The highest number of skin disease cases were recruited in the Plain region (46.35%) compared to other regions such as Tonle Sap Lak region (40.07%), the Plateau and Mountain region (9.3%), and the Coastal region (4.28%). Regions with fewer males than females (with a ratio 1) include the Pain Region, Tonle Sap Region and Coastal Region. The Plateau and Mountain Region stands out with more males than females having a mal-to-female ration 1.28, see Table 1.

The frequency of skin disease cases is presented in Table 2. Disorders of the skin and subcutaneous tissue (L80-L90) were the most common over the years, exhibiting a slight decline in both cases and overall prevalence. In 2018, this category accounted for 37.57% (118,721 cases), which decreased to 34.01% in 2022 (79,445 cases). Prevalence was highest in 2018 at 7,385 cases per 1 million, dropping to 4,943 per 1 million in 2022. Dermatitis and eczema (L20-L30) was the second most common category, showing a steady increase in both cases and prevalence. The prevalence rose from 29.69% in 2018 (93,817 cases) to 34.92% in 2022 (81,565 cases), with prevalence figures ranging from 5,836 per 1 million in 2018 to 4,843 per 1 million in 2022. Urticaria and erythema (L50-L54) remained significant, although their prevalence showed a slight decrease over the years. It started at 19.16% (60,532 cases) in 2018 and ended at 18.79% (43,904 cases) in 2022, with prevalence values ranging from 3,766 per 1 million in 2018 to 2,625 per 1 million in 2022. Scabies (B86) remained a notable condition with stable prevalence, representing 7.59% of cases in 2018 (23,979 cases) and 6.50% in 2022 (15,181 cases). Prevalence ranged from 1,492 per 1 million in 2018 to 901 per 1 million in 2022.

Infections of the skin and subcutaneous tissue (L00-L08) revealed a gradual decrease in both cases and prevalence over the years. It accounted for 3.89% of cases in 2018 (12,299 cases), dropping to 3.57% in 2019 (10,264 cases) and 3.68% in 2022 (8,594 cases). The prevalence per year ranged from 765 per 1 million in 2018 to 510 per 1 million in 2022. Disorders of skin appendages (L60-L75) showed minor fluctuations over the five years. The percentage of total cases ranged from 1.32% in 2018 (4,174 cases) to 1.44% in 2022 (3,370 cases), with a peak of 1.57% in 2021 (3,627 cases). Prevalence varied from 260 per 1 million in 2018 to 20 per 1 million in 2022. Papulosquamous disorders (L40-L54) were relatively rare, accounting for less than 1% of total cases each year. Prevalence remained low, ranging from 84 cases in 2018 to 7 cases in 2022. Radiation-related disorders of the skin and subcutaneous tissue (L55-L59) remained significant but showed a slight decrease in prevalence over the years. This condition started at 19.16% (60,532 cases) in 2018 and ended at 18.79% (43,904 cases) in 2022. Prevalence ranged from 3,766 per 1 million in 2018 to 2,625 per 1 million in 2022. Other bacterial infections consistently had very low numbers, with prevalence rates, remaining below 0.05% each year. The number of cases was minimal, with only 159 cases in 2018, and showed a steady trend of minimal cases thereafter. Melanoma and other malignant neoplasms of the skin had minimal cases, accounting for just one case in 2018 and one in 2022, with no cases reported in between. Disorders of the skin and subcutaneous tissue, as well as dermatitis and eczema, were the most prevalent and persistent skin conditions over the five years, while conditions like bullous disorders and malignant neoplasms were either absent or minimally reported. See Table 2.

Figure 1 described skin diseases from 2018 to 2022. There were 17 skin conditions recorded in the web-based. Other Disorders of the Skin and Subcutaneous Tissue (L80-L90) accounted for the highest number of cases, starting at 7,385 per million in 2018 and decreasing to 4,717 per million in 2022, with a consistent downward trend observed over the period. Pruritus (L29) condition exhibited relatively high and consistent case numbers over the years. Starting at 5,403 cases in 2018, it fluctuated but generally remained

high, with 4,454 cases in 2022. The trend shows minor annual fluctuations. Afterward, urticaria (L50) cases slightly decreased, starting at 254 per 1 million in 2018, with a minimal drop to 188 cases per million in 2022. The condition shows only minor annual changes in prevalence. Next, scabies cases declined slightly, from 1,492 per million in 2018 to 901 per 1 million in 2022, with fluctuations in between, showing a general decrease in prevalence. Erythema Multiforme (L51) Cases fluctuated significantly, starting at 1,230 per 1 million in 2018, dropping to 727 per 1 million in 2022. The lowest number was recorded in 2021 (748 cases). This condition shows a downward trend over the years.

Carbuncle of the face (02.0) was a noticeable decline in the number of cases from 684 per 1 million in 2018 to 382 per 1 million in 2022, with the lowest point (432 cases) observed in 2021. This suggests a consistent downward trend over the five years. Exfoliative Dermatitis (L26) condition experienced some fluctuations, beginning with 226 cases per 1 million in 2018, dropping to 170 per 1 million in 2021, and rising to 205 per 1 million in 2022. These fluctuations suggest some variability in the incidence of exfoliative dermatitis. The number of Atopic Dermatitis (L20) cases remained relatively stable, with slight fluctuations, starting at 168 per 1 million in 2018, dipping to 112 per 1 million in 2020, and increasing again to 148 per million in 2022. Overall, the condition showed moderate variation over the years. The number of acne (L70) cases decreased over the years, starting at 147 per 1 million in 2018 and dropping to 108 per 1 million in 2022, showing a steady decline. Later, Rosacea (L71) cases showed minor fluctuations, ranging from 112 in 2018 to 92 in 2022, with a slight dip over the years. The number of impetigo (L01) fluctuated slightly over the years, starting at 81 in 2018, peaking at 128 in 2022 after some fluctuation, and reaching 126 in 2020. Overall, impetigo cases show a slight increase over the period. Psoriasis (L40) cases declined over the years, dropping from 84 cases in 2018 to 65 cases in 2022, showing a gradual decrease in its prevalence. Seborrheic Dermatitis (L21) was consistently low throughout the five years, ranging from 39 in 2018 to 36 in 2022, with a dip to 27 cases in 2020. Seborrheic dermatitis shows relatively low and stable case numbers. The number of Sunburn (L55) was consistently low and declined from 31 per 1 million in 2018 to 20 per 1 million in 2022. The data suggests a steady decrease over the years. Cases of Radiodermatitis (L58) were also consistently low, starting at 27 per 1 million in 2018 and dropping to 5 per 1 million in 2022, showing a significant decrease over time. Leprosy, unspecific (A30.9) were very low throughout the period, starting at 10 per 1 million in 2018 and dropping to 1 per 1 million in 2022. This condition showed a marked decrease over the years. No cases were recorded for Malignant Neoplasm of the skin (C43) across all five years. See Figure 1.

Table 1 Number of skin disease cases by region for 5 years

Region	Number (n)	Male (n)	Female (n)	Ratio M/F
A. Plain Region	633,297	277,267	356,030	0.78
B. Tonle Sap Lak Region	547,494	242,491	305,003	0.80
C. Coastal Region	58,454	25,649	32,805	0.78
D. Plateau and Mountainous Region	127,094	71,321	55,773	1.28

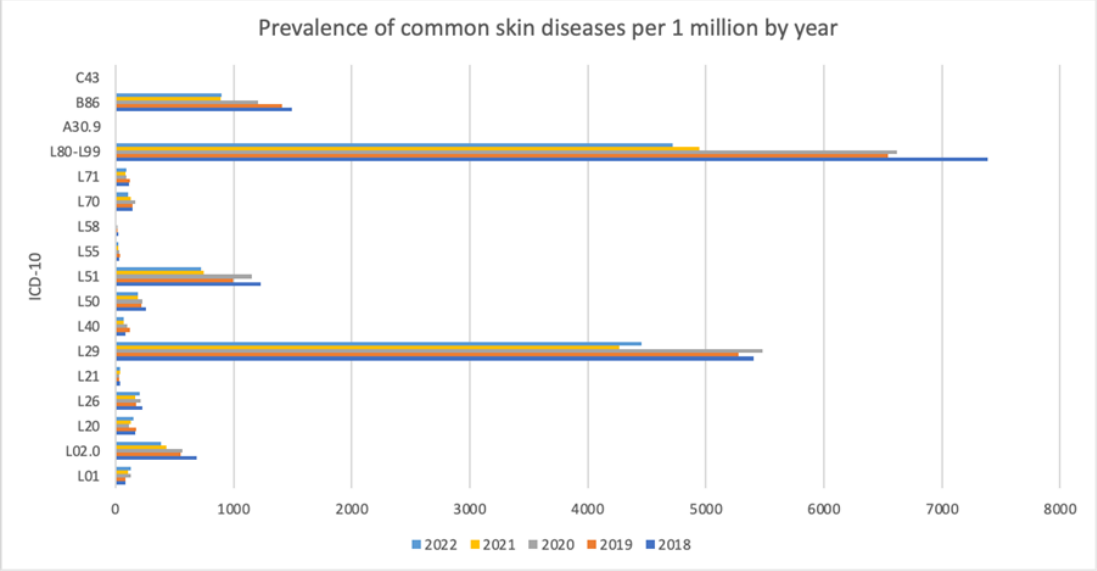

Figure 1 Prevalence of common skin diseases in ICD-10 per 1 million by year

Table 3 showed the data from 2018 to 2022 with age groups. In 2018, a total of 699 cases of other skin and subcutaneous tissue disorders were recorded in the 0-28 days age group, accounting for 0.59% of all cases, with a prevalence of 54,363 cases per 1 million. In 2019, the number of cases slightly decreased to 648, representing 0.62% of the overall cases, while the prevalence increased slightly to 57,574 cases per 1 million. The following year, in 2020, the number of cases further declined to 577 (0.53% of the total), resulting in a decrease in prevalence to 50,450 cases per 1 million. In 2021, the number of cases rose again to 468, comprising 0.57% of the total, while the prevalence decreased to 40,296 cases per 1 million. Finally, in 2022, the number of cases increased to 559 (0.70% of the total), and the prevalence rose once more to 55,314 cases per 1 million.

From 2018 to 2022, the prevalence of cases across various age groups showed significant fluctuations. In the 1 to 4 years age group, cases decreased from 19,115 (16.10%) in 2018 to 15,049 (14.31%) in 2019, continuing to decline to 14,133 (13.08%) in 2020. This trend reversed in 2022, with the number of cases rising to 10,320 (12.99%). Similarly, the 5 to 14 years group saw a decline from 21,799 (18.36%) in 2018 to 18,855 (17.64%) in 2019, followed by a slight increase in 2020 to 18,588 (17.20%). By 2022, cases stabilized at 13,378 (16.84%). The 15 to 24 years age group initially dropped from 16,602 (13.98%) in 2018 to 14,462 (13.75%) in 2019, but saw a rise in 2020 to 15,840 (14.66%) before steadily declining to 11,709 (14.74%) by 2022. For the 25 to 49 years age group, cases decreased from 29,158 (24.56%) in 2018 to 26,938 (25.62%) in 2019, then slightly rising in 2020 to 28,082 (25.98%), before falling again to 20,329 (25.59%) in 2022. The 50 to 64 years age group experienced a similar trend, with cases dropping from 15,112 (12.73%) in 2018 to 11,138 (14.02%) in 2022. The 65 and older age group showed fluctuations, with cases falling from 8,879 (7.48%) in 2018 to 7,013 (8.55%) in 2021, before rising again to 7,329 (9.23%) in 2022. Overall, while most age groups saw a decrease in the prevalence of cases, the 0-28 days and 65+ age groups exhibited some notable fluctuations during this period.

In 2022, the prevalence of 'Other Disorders of Skin and Subcutaneous Tissue' was highest in several provinces, with rates exceeding 5,000 cases per 1 million population. These provinces included Siem Reap, Banteay Meanchey, Battambang, Koh Kong, Kampong Cham, Tboung Khmum, Prey Veng, Svay Rieng, and Takeo. Provinces with a prevalence ranging from 4,001 to 5,000 cases per 1 million included Kratie and Kandal. Prevalence rates between 3,001 and 4,000 cases per 1 million were observed in Otdar Meanchey, Kampong Thom, Kampong Chhnang, and Kampot. Ratanak Kiri and Kampong Speu had prevalence rates ranging from 2,001 to 3,000 cases per 1 million. Preah Vihear, Stung Treng, Pursat, and Mondul Kiri showed

a prevalence range of 1,001 to 2,000 cases per 1 million. Pailin had a prevalence between 101 and 1,000 cases per 1 million, while the lowest prevalence was recorded in Preah Sihanouk, with fewer than 100 cases per 1 million. See Figure 2.

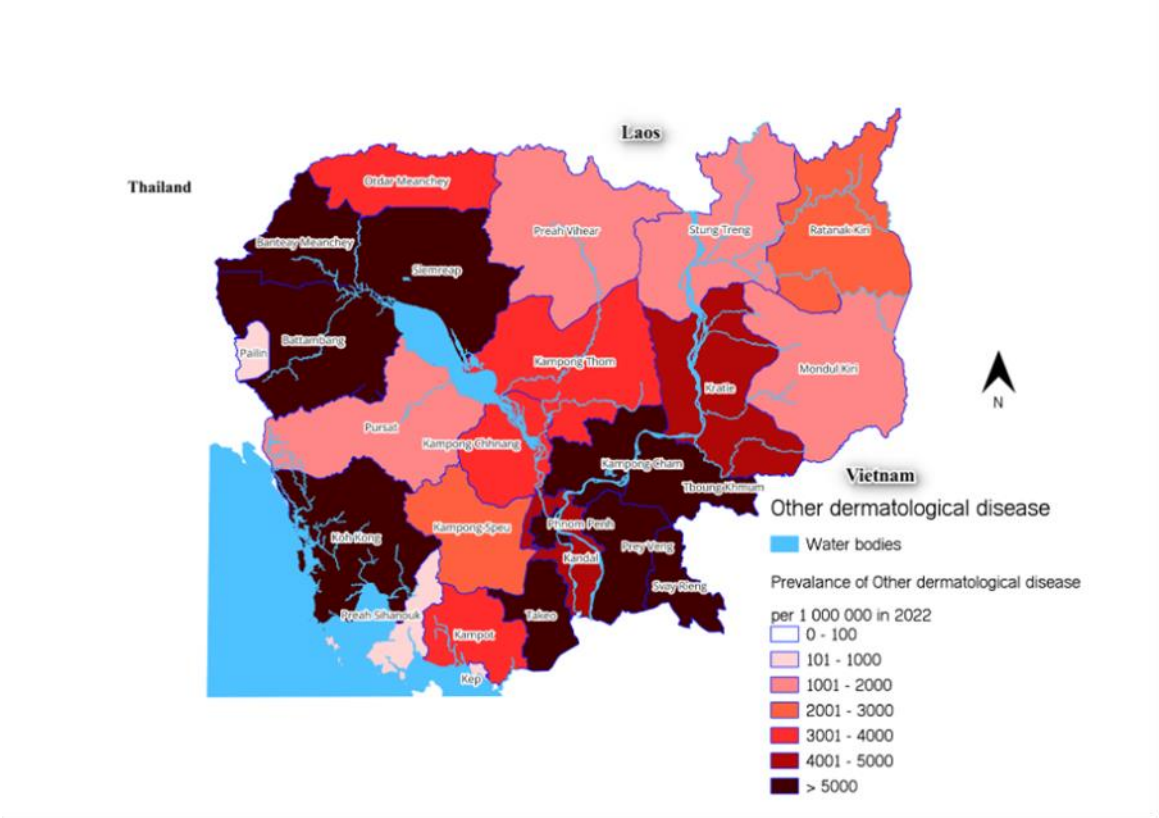

Figure 2 Prevalence of other disorders and subcutaneous tissue per 1 million, Cambodia 2022

Table 2 Prevalence of common skin diseases per 1 million by year

Diseases Description	2018			2019			2020			2021			2022		
	Cases	%	Prevalence	Cases	%	Prevalence	Cases	%	Prevalence	Cases	%	Prevalence	Cases	%	Prevalence
Infection of skin and subcutaneous tissue	12,299	3.89	765	10264	3.57	638	11358	3.813	695	8985	3.888	542	8594	3.679	510
Bullous disorders	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Dermatitis and eczema	93,817	29.69	5836	90970	31.61	5657	95278	31.99	5831	76373	33.05	4603	81565	34.92	484
Papulosquamous disorders	1,356	0.43	84	1955	0.68	122	1654	0.56	101	1187	0.51	72	1099	0.47	7
Urticaria and erythema	60,532	19.16	3766	51507	17.90	3203	56575	18.99	3462	43551	18.84	2625	43904	18.79	261
Radiation-related disorders of the skin and sbucutanous tissue	936	0.30	58	891	0.31	55	881	0.30	54	576	0.25	35	433	0.19	3
Disorders of skin appendages	4,174	1.32	260	4265	1.48	265	4255	1.43	260	3627	1.57	219	3370	1.44	20
Other disorders of the skin and subcutaneous tissue	118,721	37.57	7385	105159	36.54	6539	108074	36.28	6614	82019	35.49	4943	79445	34.01	472
Other bacterial infection	159	0.05	10	32	0.01	2	29	0.01	2	32	0.01	2	12	0.01	0
Scabies	23,979	7.59	1492	22738	7.90	1414	19758	6.63	1209	14768	6.39	890	15181	6.50	901
Melanoma and other malignant	1	0.00	0		0.00	0		0.00	0		0.00	0	1	0.00	0

neoplasms of skin										
Total	315,974	1966	287,781	1790	297,862	1823	231,118	1393	233,604	1387

Table 3 Frequency and prevalence per 1million of other disorder of skin and subcutaneous (L80-L90) tissue by age

Age	2018			2019			2020			2021			2022		
	Case	%	Prevalence	Case	%	Prevalence	Case	%	Prevalence	Case	%	Prevalence	Case	%	Prevalence
0-28 days	699	0.59	54363	648	0.62	57574	577	0.53	50450	468	0.57	40296	559	0.70	55314
29 days-11 months	7357	6.20	21191	6259	5.95	18362	6105	5.65	17965	4795	5.85	14307	4683	5.89	14113
1-4 years	19115	16.10	13453	15049	14.31	10697	14133	13.08	10020	10252	12.50	7286	10320	12.99	7364
5-14 years	21799	18.36	7835	18555	17.64	6667	18588	17.20	6557	13429	16.37	4641	13378	16.84	4523
15-24 years	16602	13.98	5352	14462	13.75	4764	15840	14.66	5243	12262	14.95	4079	11709	14.74	3916
25-49 years	29158	24.56	5103	26938	25.62	4676	28082	25.98	4768	22063	26.90	3669	20329	25.59	3309
50-64 years	15112	12.73	8212	14554	13.84	7776	15478	14.32	8001	11737	14.31	5885	11138	14.02	5456
≥ 65 years	8879	7.48	10403	8694	8.27	10010	9271	8.58	10336	7013	8.55	7548	7329	9.23	7594
Total	118721	100		105159	100		108074	100		82019	100	87710	79445	100	

To calculate prevalence by age (total number of cases in each group age/total population of each group age*1,000,000)

Table 4 Number of cases and Prevalence per 1million of total common skin diseases in four region and capital city

Region and Capital city	2018		2019		2020		2021		2022	
	Case	Prevalence	Case	Prevalence	Case	Prevalence	Case	Prevalence	Case	Prevalence
A. Plain Region	144439	18251	141355	17886	136684	17020	105219	12902	105600	12755
B. Tonle Sap Lak Region	129210	25037	109507	21826	119744	23488	93007	17964	96026	18270
C. Coastal Region	12447	11156	10684	9636	13436	11926	10943	9564	10944	9422
D. Plateau and Mountainous Region	29878	15872	26235	12800	27998	13443	21949	10376	21034	9797
E. Phnom Penh*	11972	6522	18359	7782	13958	5822	9660	3968	13486	5457

*Phnom Penh also included in Plain region

Table 4 presents the highest prevalence of commonly reported skin diseases in the Tonle Sap Lake region, with the following rates: 25,037 cases per 1 million in 2018, 21,826 per 1 million in 2019, 23,488 per 1 million in 2020, 17,964 per 1 million in 2021, and 18,270 per 1 million in 2022. These figures demonstrate a fluctuation in prevalence over the five-year period. Furthermore, Phnom Penh, the capital of Cambodia, has 17 dermatologists, which corresponds to approximately one dermatologist per one million people, as shown in Table 5. The prevalence of common skin diseases in Phnom Penh is as follows: 6,522 cases per 1 million in 2018, 7,782 per 1 million in 2019, 5,822 per 1 million in 2020, 3,968 per 1 million in 2021, and 5,457 per 1 million in 2022. These figures indicate variability in the prevalence of skin diseases in the capital over the years.

Table 5 showed the total number of dermatologists were 18 working in the public hospitals in 2022. Cambodia had 16 million of the total population in 2022. It had 1 dermatologist per 1million of people. Almost all the dermatologists work in the Plain region, and only one dermatologist works at Tonle Sap Lak region. Cambodia did not have dermatologist in other regions.

Table 5 Total number Dermatologist in Jan 2022, Cambodia

Region	Dermatologist	Dermatologist per 1,000,000 people
A. Plain Region	17	1.01
B. Tonle Sap Lak Region	1	0.06
C. Coastal Region	0	0
D. Plateau and Mountainous Region	0	0
Total	18	1.07

In our study during this five-year period, the prevalence of skin diseases and subcutaneous tissue skin diseases in the Cambodian population was 1.97% (315,974/16,074,940) in 2018, 1.79% (287,781/16,080,687) in 2019, 1.82% (297,862/16,340,109) in 2020, 1.39% (231,118/16,592,450) in 2021, and 1.39% (233,604/16,843,671) in 2022. This translated to approximately 2% of Cambodia's population being affected by skin diseases during the five-year period. Other skin and subcutaneous tissue disorders accounted for up to 37%, including dermatitis and eczema (35%), urticaria and erythema (19%), and scabies (8%), infections of skin and subcutaneous tissue (4%) each year throughout the five-year study; see Table 2. A study from a primary care area in Thailand found that other skin and subcutaneous tissue disorders affected 8.6%, dermatitis affected 29.7%, and urticaria and erythema affected 13.9%, of the total population (29,969) in the area from 2015 to 2019 (Lowell et al., 2001). A study conducted in four districts of Timor-Leste with 1,535 participants, revealed non-infection in 44% (674/1,535), fungal infection in 39% (593/1,535) (dos Santos et al., 2010). A study in South India examining in 1000 children found that infection-related dermatoses were found 346 (50.73%), and non-infection dermatoses in 253 (37.1%) (Jose et al., 2017). Cambodia has a large number of skin disease cases reported in the HMIS, primarily diagnosed as other skin and subcutaneous tissue disorders and pruritus. While the accuracy of these diagnoses was notable; however, this was due to a shortage of human resources, limited laboratory capacity, and the unavailability of dermatohistopathology in the regions.

5. Conclusion

In conclusion, Disorders of the Skin and Subcutaneous Tissue and Dermatitis and Eczema were the most prevalent and persistent skin conditions, while less common conditions like Bullous Disorders and Malignant Neoplasms showed minimal or absent cases. By region, the prevalence of 'Other Disorders of Skin and Subcutaneous Tissue' in 2022 varied significantly across provinces, with the highest rates observed in several regions, including Siem Reap, Banteay Meanchey, and Takeo. Other provinces experienced moderate prevalence, ranging, with Kratie and Kandal leading in this category. Prevalence gradually decreased across subsequent provinces, with the lowest rates found in Preah Sihanouk. This variation highlights regional differences in the occurrence of these disorders and underscores the need for targeted healthcare interventions

in provinces with higher prevalence rates. The data reveals a general decline in the prevalence of other skin and subcutaneous tissue disorders across most age groups from 2018 to 2022. However, fluctuations were observed, particularly in the 0-28 days and ≥ 65 age groups, where prevalence trends exhibited variations over the years. While most age groups, including 1 to 4 years, 5 to 14 years, 15 to 24 years, and 25 to 49 years, experienced decreases in both case numbers and prevalence, certain age groups, such as the 0-28 days and 65+, demonstrated inconsistent trends with occasional increases. These results emphasize the need for further research to explore the factors influencing these fluctuations, particularly among the youngest and oldest populations. Over a five-year period, around 2% of Cambodia's total population who sought consultation at public health facilities were affected by skin diseases. There is a clear need to improve the quality and accuracy of skin disease diagnoses, which predominantly affect the Cambodian population. Meanwhile, human resources, such as dermatologists or general practitioners, should be strongly considered for inclusion in training programs. These study findings underscore the dynamic nature of skin disease epidemiology and highlight the need for ongoing monitoring and targeted healthcare interventions to address the evolving patterns of skin disorder prevalence. This is crucial for effective healthcare management, medical training (such as dermatology programs), human resource allocation, and disease prevention and control. Additionally, improving data management and expanding its scope to include the 143 public health facilities and 16,185 private sectors is essential for better tracking and understanding the trends in skin diseases. Further research to figure out the factors influencing it shall be considered in the near future.

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7. References

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