CLINICAL SPECTRUM OF DERMATOLOGICAL DISEASES

AT A REGIONAL HOSPITAL

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DECLARATION

I, Zateen Modi, declare this research report is my own unaided work. It is being submitted for the Degree of Masters of Medicine (in submissable format with my protocol and extended literature review) at the University of Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at another university.

7 Day of December 2020

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ABSTRACT

Background

The frequency of skin disorders varies considerably worldwide and is based on age; ethnicity; gender and geographical region amongst other factors. Tertiary referral hospitals, as well as private practices, serve specific patient profiles and are not necessarily representative of the general population. There is therefore a need for regional hospital research to meet the dermatologic requirements of specific communities.

Objectives

This study aims to document the demography and spectrum of dermatological diseases seen at a regional hospital.

Methods

A retrospective cross-sectional chart review of all patients (in/out-patients and adults/ children) seen at the dermatology department at Tambo Memorial Hospital between 6 February 2014 and 31 August 2018. All patients were diagnosed by staff (registrars and consultants) of the Division of Dermatology at the University of the Witwatersrand, with the academic head consulted via tele-dermatology for difficult cases. The diagnoses were made clinically with histopathology and biochemical investigations being performed where necessary. The demography and diagnoses were recorded for each patient. The demography was summarized using descriptive statistics. The skin disorders were classified according to the International Classification of Diseases (ICD 10) codes. The patients were divided into 2 age groups: children (0-18 years) and adults (>18 years).

Results

We recorded 3150 patients, with 2334 adults (75.7%) and 749 children (23.8%). Females predominated amongst both the adults (60.7%) and children (52.1%). Black Africans comprised the majority of patients across all age groups. The 5 most common diseases identified were eczemas (41.4%; CI 39.7-43.1); infectious diseases (13.3%; CI 12.1-14.5);

acne (12.4%; CI 11.2-13.5); papulosquamous disorders (7.6%; CI 7.5-7.7) and pigmentary disorders (5.3%; CI 5.1-5.5).

Conclusion

The results of this study are largely consistent with epidemiologic data on skin diseases in South Africa. Noteworthy findings are the dominance of eczema and acne in our study which consolidate the shifting trend in the prevalence of skin disorders. Infections which previously predominated have decreased possibly indicative of general improved living conditions and improved access to specialist healthcare clinics.

We are hopeful that the data generated by this study will contribute to an essential drug list which prioritizes common conditions. We have compiled a provisional list, based on our findings and suggest that this could assist towards a national, standardized drug list.

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ABBREVIATIONS

ART	Anti-retroviral therapy
CI	Confidence intervals
DALY	Disability-adjusted life year
EDV	Epidermodysplasia verruciformis
GBD	The Global Burden of Disease
HIV	Human Immunodeficiency Virus
HPV	Human papilloma virus
HSV	Herpes simplex virus
ICD	International Classification of Diseases
TMH	Tambo Memorial Hospital

Chapter 1: Protocol with Extended Literature review

1.1 Extended Literature Review

1.1.1 Background

The skin is the largest human organ and its myriad functions include sensation, temperature and hydration regulation as well as immunological surveillance. It also serves a significant role in the determination of our identity and physical appearance. This organ therefore regulates to some degree our physical and social interactions with our environment, and skin disorders have the potential to significantly impact on both our physical and mental well-being[1].

1.1.2 Burden of Skin Diseases

The Global Burden of Disease (GBD) study provides measurements of disability and mortality for amongst other conditions skin disorders[2]. The study included data on 306 diseases and injuries in 188 countries, including the sub-Saharan region. The 'burden of disease is approximated using the measurement of disability-adjusted life year (DALY). One DALY equates to the loss of 1 year of healthy life. This metric allows for the cross-comparison of a variety of diseases. In the 2013 GBD study, skin conditions accounted for 1.79% of the global burden of disease and were the 18th leading cause of global DALYs. Skin disorders were the fourth leading cause of disability worldwide (excluding mortality) and affect 1.9 billion people at any given time. Skin ailments are a common cause of hospital visits worldwide. The GBD revealed variations in the burden of disease based both on geography and age[2].

1.1.3 Geography of Skin Diseases

Geographical disparities have been documented for mortality from skin malignancies and infectious causes of skin disorders[3]. Boyers et al reviewed global mortality from conditions with skin manifestations. Their analysis was based on data from the 2010 GBD study. They surmised that there was a significant disparity in the rate of melanoma deaths between developed and developing countries. The rate in developed countries was almost 5 times higher, a consistent trend since 1990. The possible reasons for the higher rate in developed countries include populations which are predominantly fair-skinned, emphasis on outdoor activities, tropical latitude and ultraviolet light exposure from indoor tanning facilities. The mortality associated with basal and squamous cell carcinomas were marginally higher in developed countries[3].

In developing countries, unsurprisingly infections account for the bulk of deaths from skin diseases[3]. The 5 conditions with significantly higher mortality rates in developing countries include measles, syphilis, bacterial skin infections, cellulitis and varicella. The mortality from measles is astonishingly 197 times higher in developing countries, mainly in Africa. Factors contributing to measles mortality include poor health facilities, general infrastructure deficiencies, location and financial support. This discrepancy in measles mortality between developed and developing countries has decreased since 1990, as a result of improved vaccination programs. Syphilis caused markedly higher mortality (41 times) in developing countries, especially in Africa. This is notwithstanding the easily available and relatively low-cost treatment (penicillin) for treatment of the condition[3].

The mortality figures reflect the differing disease burdens between developed and developing countries.

1.1.4 Influence of Age on Skin Disorders

Skin disorders affect all ages from birth to the elderly but individuals at the extremes of age bear an unequal burden. The 2013 GBD study revealed the following noteworthy findings (see Figure 1.1 below)[2]:

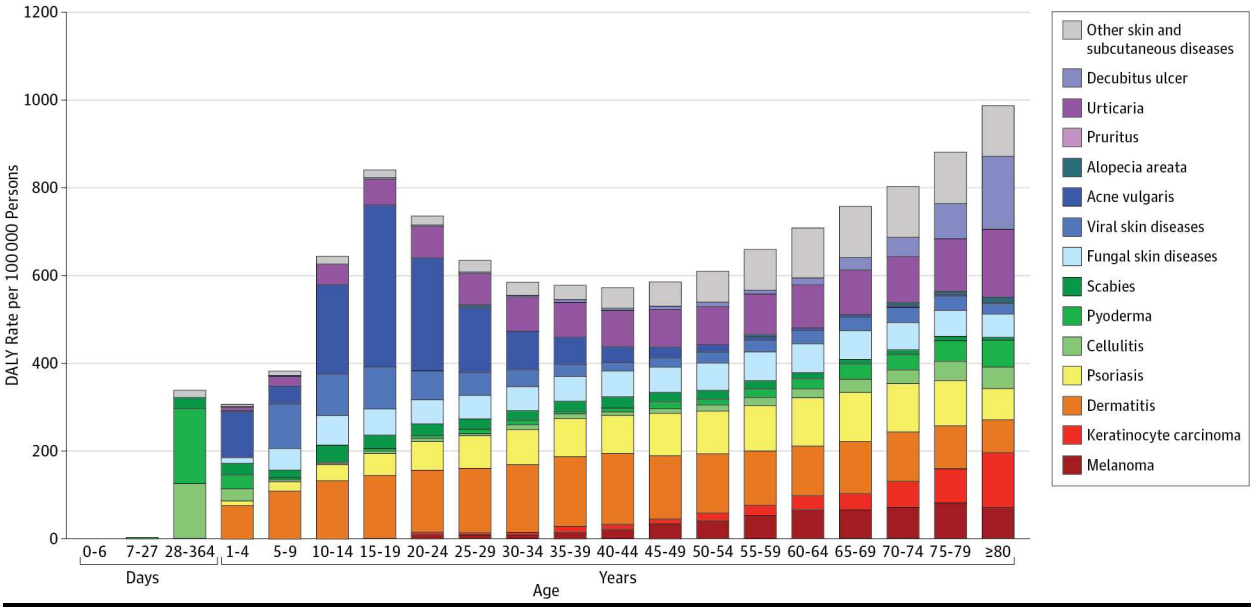

Figure 1.1 Age Distribution of Skin and Subcutaneous Disease Burden[2]

This figure above shows DALY rate per 100 000 persons from 15 skin disease categories throughout the human life span[2].

- The impact of dermatitis was constant in all age groups
- In younger children (<5 years) infections (viral warts, bacterial skin diseases and scabies) predominated
- Acne vulgaris accounted for a significant burden between the ages of 1 and 30 years
- Psoriasis, alopecia areata, urticaria, fungal skin diseases and decubitus ulcer occur more commonly in older age categories
- Keratinocyte carcinoma and melanoma occur with increasing frequency in advanced age, with the greatest rates in those above 75 years

Multiple studies have documented skin diseases in childhood, both in developed and developing countries. The table 1.1 below summarizes some of these, focusing predominantly on regional studies.

Table 1.1 Spectrum of skin diseases in Childhood

Author	Year	Setting	No. of children	Mean Age	3 most common conditions
Findlay et al[7]	1974	Private practice, Transvaal, South Africa White patients	9877	Not given All <12yrs	Eczema Verruca vulgaris Impetigo
Wenk, Itin[8]	2003	Referral Hospital, Aargau, Switzerland	1105	6.8yrs	Atopic Dermatitis Pigmented naevi Warts
Komba, Mgonda[9]	2010	Dar es Salaam, Tanzania	420	14±2.8yrs	Acne vulgaris Dermatophytosis Pityriasis versicolor
Kiprono et al[10]	2015	The Regional Dermatology Training Center (RDTC) skin clinic, a tertiary referral clinic in Northern Tanzania.	340	4.2yrs	Skin infections and infestations Eczema Urticaria and drug reactions
Ayanlowo et al[11]	2018	Lagos University Teaching Hospital, Nigeria	6373	8.31±5.44	Skin infections and infestations Eczema Papulosquamous eruptions
Kelbore et al[12]	2019	Wolaita Sodo Teaching and Referral Hospital, Ethiopia	1704	Not available	Skin infections and infestations Eczema Pigmentary diseases

1.1.5 Skin Diseases in South Africa

Three epidemiological studies of skin diseases in South Africa have recently been published (see table 1.2 below). In 2003 Hartshorne published a retrospective study on dermatological disorders in Johannesburg, South Africa[4]. The study conducted in 1999, surveyed the dermatological outpatients in five academic hospitals under the auspices of the University of the Witwatersrand. These were all public sector hospitals, based in urban areas. They are tertiary referral hospitals for surrounding areas. The study included patients of all race groups and the relative frequency of conditions was documented for each group. Unfortunately, there was no analysis of the effect of age on the frequency of specific conditions. This study included a large number of patients with presumed Human Immunodeficiency Virus (HIV)-related skin disorders (seborrheic dermatitis; varicella zoster; Kaposi sarcoma and warts)[4]. The study was done in an era where anti-retroviral therapy (ART) was not widely available in the public sector. Presumably the profile of HIV-related skin disorders has changed with the widespread availability of ART.

The 2015 study by Dlova et al provided valuable insights but may not be widely applicable in our setting[5]. The authors reviewed the record of 7064 predominantly Black patients from a private healthcare facility, situated in an urban area. This was the first study to document skin diseases in Kwazulu Natal and may assist in documenting local regional differences in the spectrum of skin diseases if present. The majority of their patients (86.9%) were adults and there was a marked female predominance (74.1%). In their cohort acne was the most common condition diagnosed. An unusual finding in this study was the relatively low frequency (10.3%) of infectious cases seen. The authors ascribed this to the improved living conditions of the population under review and changes in health seeking behavior.

The recently published letter on the epidemiology of skin diseases seen at public sector referral hospitals in Kwazulu Natal may represent a more accurate picture of the current profile of dermatological conditions that we are challenged with[6]. This study described the skin conditions documented at referral hospitals in Durban. The study was conducted over a 3-month period and included both adults (77.6%) and children (22.4%). A

significant limitation in this study was the short duration (3 months) with seasonal bias. Notwithstanding this limitation, it is the most recent publication outlining the disease profile in the public sector in this country. There was a female predominance, which was not as marked (65%) as seen in the private healthcare study discussed above. The disease profile in this study was similar to that of Hartshorne and infections accounted for 16.5% of conditions categorized.

There have been other studies documenting skin diseases in South Africa previously but these were done many decades ago and may not accurately reflect current disease profiles[5].

Table 1.2 Spectrum of skin diseases in South Africa

Author	Year	Setting	No. of patients	3 most common conditions
Hartshorne[4]	2003	Johannesburg; 5 tertiary referral hospitals (public sector)	5355	Eczema; infections; acne
Dlova et al[5]	2015	Durban; private practice	6664	Acne; eczema; dyschromias
Dlova et al[6]	2018	Durban; tertiary referral hospitals (public sector)	3814	Eczema; infections; acne

1.1.6 Motivation for this study

The differences in the frequency of skin disorders highlight the need for regional research in an effort to truly comprehend and manage the dermatologic requirements of specific communities. There are only 220 practicing dermatologists in South Africa with most working in private urban areas[6]. Dermatology services are therefore very limited in the public sector, which services approximately 85% of the country's population[6]. A means of addressing the above, and alleviating the burden of dermatological disease on our healthcare system, is to target the most common skin diseases. Information on the spectrum of diseases and the number of patients requiring this service is scarce. This knowledge could enable improved services and an equitable distribution of the limited resources. We require recent, relevant research to elucidate the skin diseases that are common in the general public setting. It is also important and necessary to get data from areas that represent the greater general population, as tertiary and quaternary hospitals, as well as private practices, serve specific patient profiles. The spectrum of skin disorders can vary between rural and urban areas[13].

In the face of this need to both improve and expand dermatology services the Division of Dermatology; University of the Witwatersrand established a once a week outpatient dermatology service at Tambo Memorial Hospital (TMH) in 2014. The specialist outreach program was designed to

- Make our service easily accessible to a peri-urban community
- Decrease the number of patients requiring tertiary referral.

TMH is a Level 2 regional hospital serving the geographical areas of Boksburg; Benoni; Kempton Park and sections of Germiston and the surrounding informal settlements. The catchment area consists of approximately 1.2 million people.[11] The current dermatology service provides both in and out patient care.

This aim of this study is to document the profile of skin diseases seen at TMH, a regional hospital. Taking into account the setting, we anticipate that the findings of this study would be representative of skin diseases in the South African public sector. We hope to highlight

the skin diseases that are most common and prevalent. This study may help in the establishment of an efficient framework for the development of further outreach services at similar facilities countrywide. The findings could further assist in the establishment of an essential drug list for common dermatological conditions.

1.2 Study Objectives

1.2.1. To describe the demography of the population seeking dermatological consultation at a regional public hospital

1.2.2. To outline the clinical spectrum of dermatological disease in adults and children

1.2.3. To provide, through the data obtained an essential drug list for similar outreach clinics.

1.3 Methods

Study Design: Retrospective record review. Descriptive study.

Study Population: All patients seen by the dermatology division at TMH (both in-patient consults and out-patients)

Inclusion Criteria: All patients seen by the dermatology division at TMH from 6 February 2014 to 31 August 2018 (4.5 years).

Exclusion Criteria: Patients with incomplete information i.e. no specific diagnosis/ age/ gender/ race documented

Data Collection: Data will be collected from the dermatology clinic records at TMH utilizing a data collection form. (See Appendix A)

Data entry and storage: Each study subject will be assigned a random study number. Data will be obtained from the clinical records using a data collection form. Data from the collection form will be entered into an Excel spread sheet. At no point will records be removed from the site or identifiers entered in the study database.

Data Analysis: As this is a descriptive study the sample size will be realized from the records available. Baseline and demographic characteristics will be summarized using descriptive statistics (means, standard deviations for continuous variables such as age and percentages for categorical variables such as race.)

1.4 Ethics Approval

Permission to embark on the study will be obtained from

- The CEO of TMH
- The Human Research Ethics Committee of Wits University

1.5 Limitations

Since this study is retrospective the accuracy of the data is based on the records available.

This study only covers a 4.5 year period due to the clinic's inception in 2014

1.6 Funding

The collection and printing costs will be borne by the candidate.

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Chapter 2: Submissible Article

Title: CLINICAL SPECTRUM OF DERMATOLOGICAL DISEASES AT A REGIONAL HOSPITAL, A Study from Gauteng, South Africa

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Abstract

Background

The frequency of skin disorders varies considerably worldwide and is based on age; ethnicity; gender and geographical region amongst other factors. Tertiary referral hospitals, as well as private practices, serve specific patient profiles and are not necessarily representative of the general population. There is therefore a need for regional hospital research to meet the dermatologic requirements of specific communities.

Objectives

This study aims to document the demography and spectrum of dermatological diseases seen at a regional hospital in Gauteng, South Africa.

Methods

A retrospective cross-sectional chart review of all patients (in/out-patients and adults/ children) seen at the dermatology department at Tambo Memorial Hospital between 6 February 2014 and 31 August 2018. All patients were diagnosed by staff (registrars and consultants) of the Division of Dermatology at the University of the Witwatersrand, with the academic head consulted via tele-dermatology for difficult cases. The diagnoses were made clinically with histopathology and biochemical investigations being performed where necessary. The demography and diagnoses were recorded for each patient. The demography was summarized using descriptive statistics. The skin disorders were classified according to the International Classification of Diseases (ICD 10) codes. The patients were divided into 2 age groups: children (0-18years) and adults (>18 years).

Results

We recorded 3150 patients, with 2334 adults (75.7%) and 749 children (23.8%). Females predominated amongst both the adults (60.7%) and children (52.1%). Black Africans comprised the majority of patients across all age groups. The 5 most common diseases identified were eczemas (41.4% CI 39.7-43.1); infectious diseases (13.3% CI 12.1-14.5);

acne (12.4% CI 11.2-13.5); papulosquamous disorders (7.6% CI 7.5-7.7) and pigmentary disorders (5.3% CI 5.1-5.5).

Conclusion

The results of this study are largely consistent with recently published epidemiologic data on skin diseases in South Africa. Noteworthy findings are the dominance of eczema and acne in our study which consolidate the shifting trend in the prevalence of skin disorders. Infections which previously predominated have decreased possibly indicative of general improved living conditions and improved access to specialist healthcare.

We are hopeful that the data generated by this study will contribute to an essential drug list which prioritizes common conditions. We have compiled a provisional list, based our findings and suggest that this could assist towards a national, standardized drug list.

Introduction

The Global Burden of Disease (GBD) study revealed variations in the burden of disease based both on geography and age[1]. The pattern of skin diseases differs between countries and even within regions in the same country due to multiple factors including environmental influences, standard of hygiene, communal practices and population genetics[2]. Three epidemiological studies of skin diseases in South Africa have been published in this millennium (see table 2.1 below). Studies done prior to this period may not be an accurate reflection of current disease profiles, which have changed following the abolishment of apartheid in 1994.

Table 2.1 Recently published studies of Skin diseases in South Africa

Author	Year	Setting, Demography	No. of patients	3 most common conditions
Hartshorne[3]	2003	5 referral hospitals, Johannesburg Multi-ethnic population adults and children	5355	Eczema; Infections; Acne
Dlova et al[4]	2015	Private practice, Durban Black African adults and children	6664	Acne; Eczema; Dyschromias (Pigmentary disorders)
Dlova et al[5]	2018	Durban; tertiary referral hospitals (public sector)	3814	Eczema; Infections; Acne

In this post-apartheid era, the studies detailed above represent different clinical settings. The study by Hartshorne was conducted at public sector hospitals in Gauteng, prior to the widespread availability of anti-retroviral therapy (ART)[3]. The 2015 study by Dlova et al provided valuable insights but may not be widely applicable in our setting as the patients were recruited from a private healthcare facility[4]. The 2018 article by Dlova et al documenting skin diseases at public sector referral hospitals in KwaZulu Natal may be more representative, but this was documented over a 3-month period only[5].

Multiple studies have analyzed skin diseases in childhood, both in developed and developing countries. In developing countries in Africa skin infections and infestations are amongst the most common skin conditions seen, whilst in the developed world they do not feature[6-11]. The variances in the frequency of skin disorders highlights the need for regional research in an effort to truly comprehend the dermatologic requirements of specific communities especially those that are more representative of the general population, as tertiary referral hospitals and private practices serve specific patient profiles.

The aim of this study was to document the clinical spectrum of skin conditions seen at Tambo Memorial Hospital (TMH). TMH is a Level 2 regional hospital serving the geographical areas of Boksburg; Benoni; Kempton Park and sections of Germiston and the surrounding informal settlements in Gauteng. A specialist dermatology outreach service was established at the facility in 2014. We anticipate that the findings of this study will serve to highlight the dermatological diseases that are common and prevalent in the public health sector at a regional level and enable improved services and an equitable distribution of limited public sector resources.

Methods

Setting and data collection

A retrospective cross-sectional chart review, of all patients (in/out-patients and adults/children) presenting to the dermatology department at the Tambo Memorial Hospital between 6 February 2014 and 31 August 2018, was conducted. All patients were diagnosed by staff (registrars and consultants) of the Division of Dermatology at the University of the Witwatersrand, with the academic head consulted via tele-dermatology for difficult cases. The diagnoses were made clinically with histopathology and biochemical investigations being performed where necessary. The data from the initial visit and the principal diagnosis was recorded. Patients with incomplete information in whom no diagnosis was obtained were excluded. Patients who came for subsequent

repeat visits were excluded. The patients were divided into 2 age groups: children (0-18years) and adults (>18 years). The skin disorders were classified according to the International Classification of Diseases (ICD 10) codes. Specific sub-types in certain categories e.g. eczema were also documented. The data was captured onto specific data collection forms (Appendix A) and entered on a Microsoft Excel Spreadsheet.

Ethics to conduct the study was obtained from the University of the Witwatersrand Faculty of Health Sciences (Appendix B) and permission obtained from the superintendent of the Tambo Memorial Hospital (Appendix C).

Statistical Analysis

The Predictive Analytics Software (PASW) version 21.0 for Windows (SPSS Inc., Chicago, IL, USA) was used for all analyses. Data were tested for normal distribution using the Kolmogorov-Smirnov test. To investigate the differences between groups, a Mann-Whitney U test was used for two groups and a Kruskal-Wallis H test for more than two groups. The chi-square test and Fisher's exact test were performed for categorical variables. Confidence intervals (CI) were calculated for the prevalence of all skin diseases. This provided a 95% accuracy towards the frequency of the specific skin diseases in the studied population. *P* values of less than 0.05 were considered to be statistically significant.

Results

A total of 3150 case records were included and the demographic findings of the study group are summarized in Table 2.2 below.

Table 2.2 Demographic findings in 3150 patients

Median age (Range)	39 years (0-90)	
	N	%
Age groups		
Children	749	23.8
Adults	2334	74.1
Undocumented age	67	2.1
Gender		
Female	1490	47.3
Male	973	30.9
Undocumented gender	687	21.8
Ethnicity		
African	2431	77.2
White	576	18.3
Coloured	15	0.5
Indian	98	3.1
Undocumented ethnicity	30	1

Females predominated amongst adults (60.7%) and children (52.1%). Black Africans comprised the majority of patients in both adults (75.8%) and children (88.2%). In all ethnic groups females were significantly more common than males (p: 0.038, Chi-Square test). The median age was 45 (1-88) years in males and 47 (1-90) years in females, respectively (p: 0.036, Mann-Whitney U test). Whites (56 years) and Indians (67 years) were significantly older than African (34 years) and Coloured (38 years) patients ($p < 0.01$, Kruskal- Wallis test).

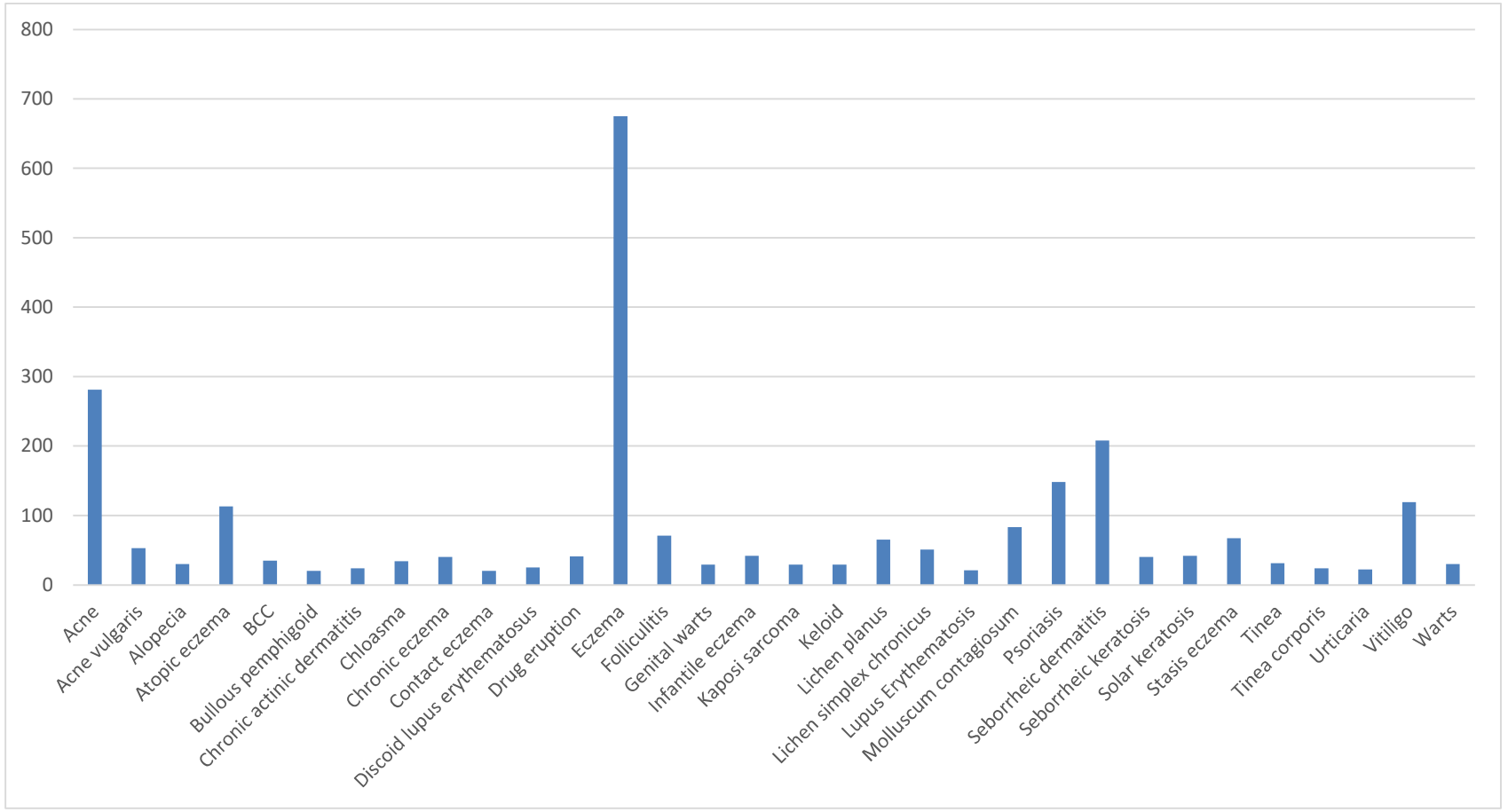

Figure 2.1. Clinical spectrum of dermatological diseases at Tambo Memorial Hospital

There were 157 different diagnoses in the cohort. The complete list of diagnoses made and number of patients in each category can be seen in Appendix D. The diagnoses were regrouped into 12 main disorders according to the International Classification of Diseases (ICD 10) codes (Table 2.3) and the 5 most common disorders were compared amongst the various age, gender and ethnic groups (Table 2.4).

Table 2.3 Skin disorders according to ICD 10 codes

	n	Prevelance (%)	95% CI
Eczema	1304	41.4	39.7-43.1
Infectious diseases	420	13.3	12.1-14.5
Acne	390	12.4	11.2-13.5
Papulosqamous disorders	238	7.6	7.5-7.7
Disorders of Pigmentation	167	5.3	5.1-5.5
Reactive dermatoses	145	4.6	4.4-4.8
Benign skin tumours	121	3.8	3.6-3.9
Malignant skin tumours	83	2.6	2.4-2.8
Connective tissue diseases	68	2.2	2.1-2.3
Hair disorders	43	1.4	1.3-1.5
Bullous diseases	36	1.1	0.9-1.2
Others*	135	3.4	3.2-3.6

*Sarcoidosis, pruritus, genodermatosis, pellegra, keloids were categorized into others.

Eczemas were the most common skin diseases diagnosed in males (39%) and females (32.8%). This was followed by infectious diseases in males (15.2%) and acne and its variants in females (17.4%). There were significant changes in the frequency of skin disorders between genders ($p< 0.01$, Chi-square test). The most common skin disorder was eczemas in both age groups (35% in adults and 61.9% in children). However, the distribution of skin disorders in adults and children were significantly different from each other. In adults eczemas were followed by acne (15.1%) and papulosquamous disorders

(9%), whereas in childhood eczemas comprised the majority of skin diseases, followed by infections (16.4%). (p<0.01, Chi-square test).

Table 2.4 shows the distribution of skin disorders in ethnic groups. Eczemas were significantly the most common skin disease in all ethnic groups followed by infections, except in Indians whereas papulosquamous disorders were the second most common skin disease (p<0.001, Chi-square test).

Table 2.4 The five most common skin disorders

Skin Diseases	Black (n=2431)	White (n=576)	Indian (n=98)	Coloured (n=15)
Acne	336 (13.8%)	44 (7.6%)	5 (5.1%)	2 (13.3%)
Eczema	1025 (42.2%)	213 (37.0%)	47 (48%)	6 (40%)
Infectious diseases	346 (14.2%)	65 (11.3%)	6 (6.1%)	1 (6.7%)
Papulosquamous diseases	150 (6.2%)	62 (10.8%)	22 (22.4%)	1 (6.7%)
Disorders of Pigmentation	134 (5.5%)	22 (3.8%)	9 (9.2%)	0 (0%)
Others	440 (18.1%)	170 (29.5%)	9 (9.2%)	5 (33.3%)

The five common skin diseases documented will be analyzed further.

Eczema

The prevelance of eczema in this study group was 41.1% (CI: 39.7-43.1). It was statistically the most common disorder in both genders and in all age and ethnic groups.

The prevalence amongst the various ethnic groups was Blacks:79%; Whites:16%; Indians:3%; Coloureds:<1%. The ethnicity was unavailable for 1% of patients.

The majority of eczema cases were diagnosed in young children, with prevalence tapering off in patients older than 70 years. See figure 2.2 below. The median age of patients with eczema was 35 years, and the median age of patients with atopic eczema was 4 years. This was statistically significantly lower than the other subtypes of eczemas ($p<0.001$, Kruskal-Wallis test).

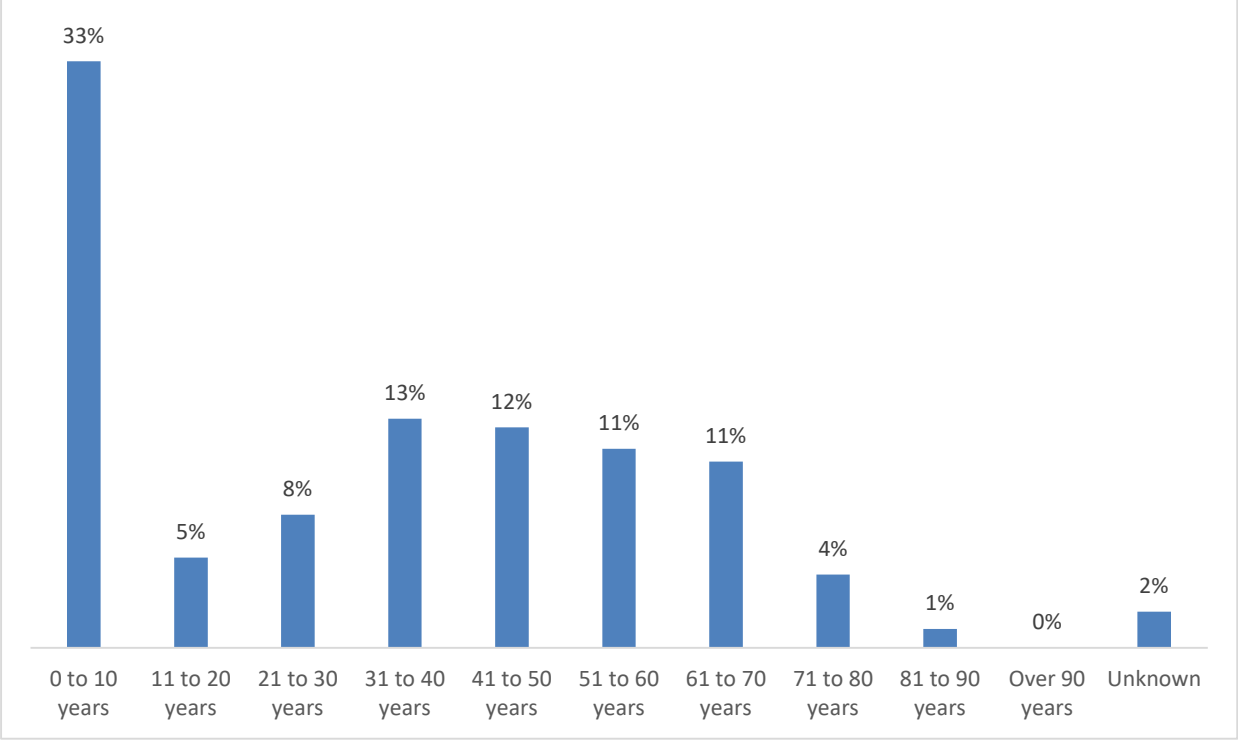

Figure 2.2 Age distribution of 1238 Eczema patients

Unfortunately, the majority of our patients with eczema did not have their subtype noted (see Table 2.5 below).

Table 2.5 Eczema Subtypes

	N	%
Seborrheic	208	16.0
Atopic and infantile	153	11.7
Stasis	67	5.1
Contact dermatitis	23	1.8
Hand and Foot	19	1.5
Nummular	18	1.4
Unclassified	816	62.5

Infectious Diseases

We calculated the prevelance of infectious diseases at 13.3% (CI: 12.1- 14.5). This was the second most common disorder in children.

The majority of cases diagnosed with infectious disases were children <10years (24%). (See figure 2.3 below). Viral infections were more common in younger patients than bacterial and fungal infections. Molluscum contagiosum was significantly more commonly seen in children; with the median age of affected individuals being 5 years (p<0.001, Kruskal-Wallis test).

The prevalence of infectious diseases amongst the various ethnic groups was as follows: Blacks:82.4%; Whites:315.5%; Indians:1.4%; Coloureds:0.2%. The race group was unavailable for 0.5% of patients. The ethnic composition of patients diagnosed with infectious diseases did not show any difference from the study cohort (p=0.434, Fisher's exact test).

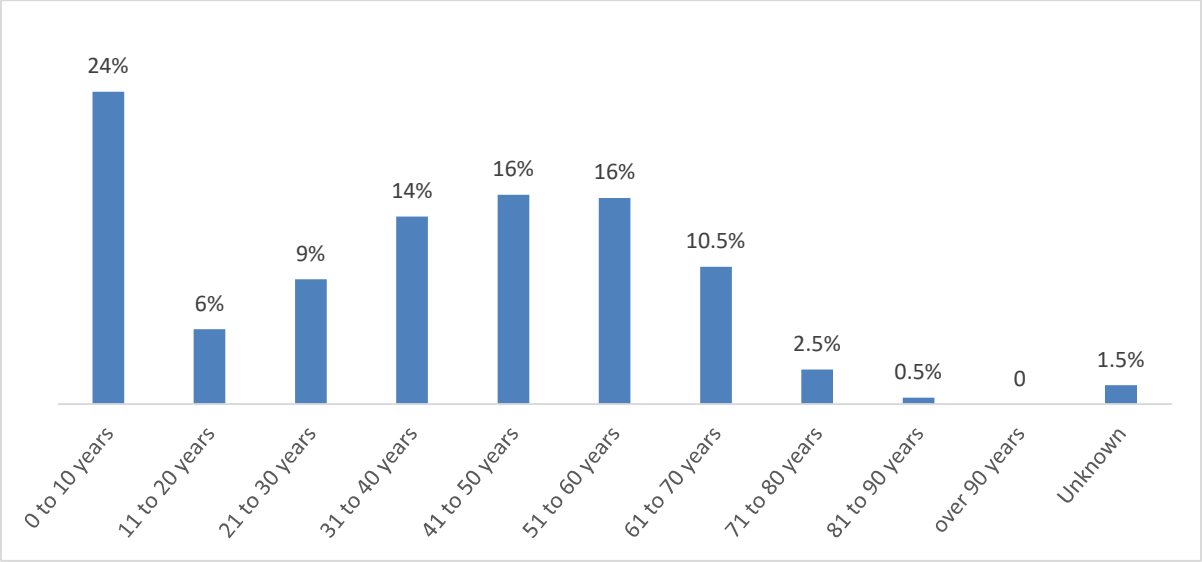

Figure 2.3 Age distribution of 420 patients with an infectious disease

Table 2.6 Infectious Diseases

Infectious Diseases	n	%	Median age (years)
Bacterial Infections	105	25%	39
Folliculitis	71	16.9%	37
Viral Infections	182	42.9%	16
HPV	86	20.4%	37
• Non-specified warts	30	7.1%	
• Genital warts	29	6.9%	
• Flat warts	17	4%	
• Verruca vulgaris	8	1.5%	
• EDV	4	0.8%	
Molluscum contagiosum	82	19.5%	5*
Fungal Infections	129	30.7%	47.5
Superficial fungal infections	104	24.7%	47.5
Parasitic Infestations	6	1.4%	4.5
Scabies	6	1.4%	4.5

HPV, Human papilloma virus; *EDV*, epidermodysplasia verruciformis; *HSV*, herpes simplex virus.

* $p<0.001$, Kruskal-Wallis test

Acne

The prevelance of acne was 12.4% (CI: 11.2-13.5). This was the second most common disorder in adults. Female patients comprised the majority of acne patients except in the subtypes of nodulocystic acne and the other variants, where 73.7% and 71.4% of patients were male respectively ($p<0.001$, Fisher's exact test).

The vast majority of patients with acne were aged between 11 and 40 years, with a median age of 30 years. See figure 2.4 below. The gender distribution was females:66%; males:29% and undocumented:5%.

The prevalence amongst the various ethnic groups was Blacks:86%; Whites:11%; Indians:1%; Coloureds:1%. The race group was unavailable for 1% of patients.

The majority of acne subtypes were unclassified. The median age was 29 years, which is statistically significantly lower than rosacea and steroid induced rosacea (53 and 52.5 years, respectively) (p=0.02, Kruskal-Wallis test).

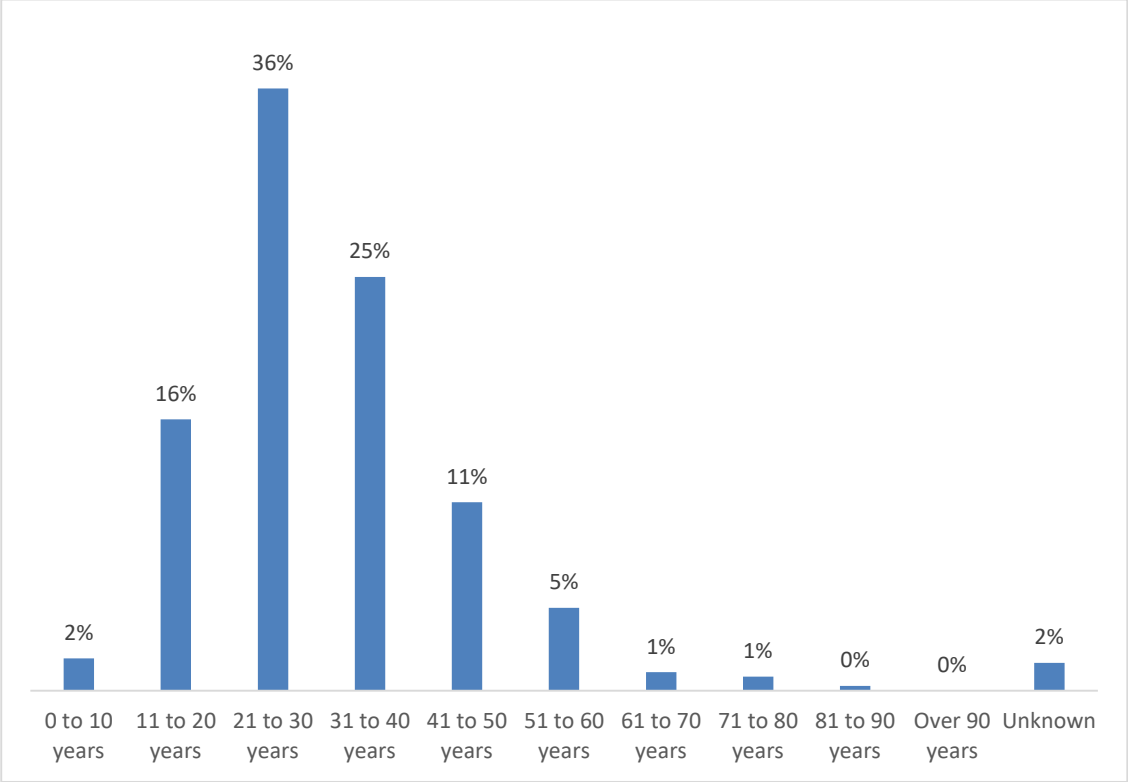

Figure 2.4 Age distribution of 390 patients with acne

Table 2.7 Acne and its variants

	N	%
Acne vulgaris	53	13.5
Nodulocystic acne	19	4.9
Steroid induced acne	11	2.8
Steroid induced Rosacea	12	3.1
Rosacea	8	2.1
Pseudofolliculitis barbae	6	1.5
Acne keloidalis nuchae	1	0.3
Unclassified	280	71.8

Papulosquamous disorders

The prevelance of papulosquamous disorders in this study group was 7.6% (CI: 7.5-7.7). The gender distribution was females: 56%; males: 33% and undocumented: 11%. There was no statistically significant difference in gender distribution for the papulosquamous disorders (p:0.055, Chi-square test).

The majority of papulosquamous diseases cases were diagnosed between the ages of 40 to 60 years (51%). See figure 2.5 below. The median age of psoriasis and lichen planus patients was 50 and 47.5 years, respectively. Significantly, pityriasis rosea was diagnosed in younger patients (median age of 19 years) compared to psoriasis patients ($p<0.001$, Kruskal-Wallis test).

The prevalence amongst the various ethnic groups was Blacks: 63%; Whites: 26%; Indians:9%; Coloureds:<1%. The race group was unavailable for 1.5% of patients. Papulosquamous disorders were the second most common skin disease diagnosed in Indians ($p<0.001$, Chi-square test).

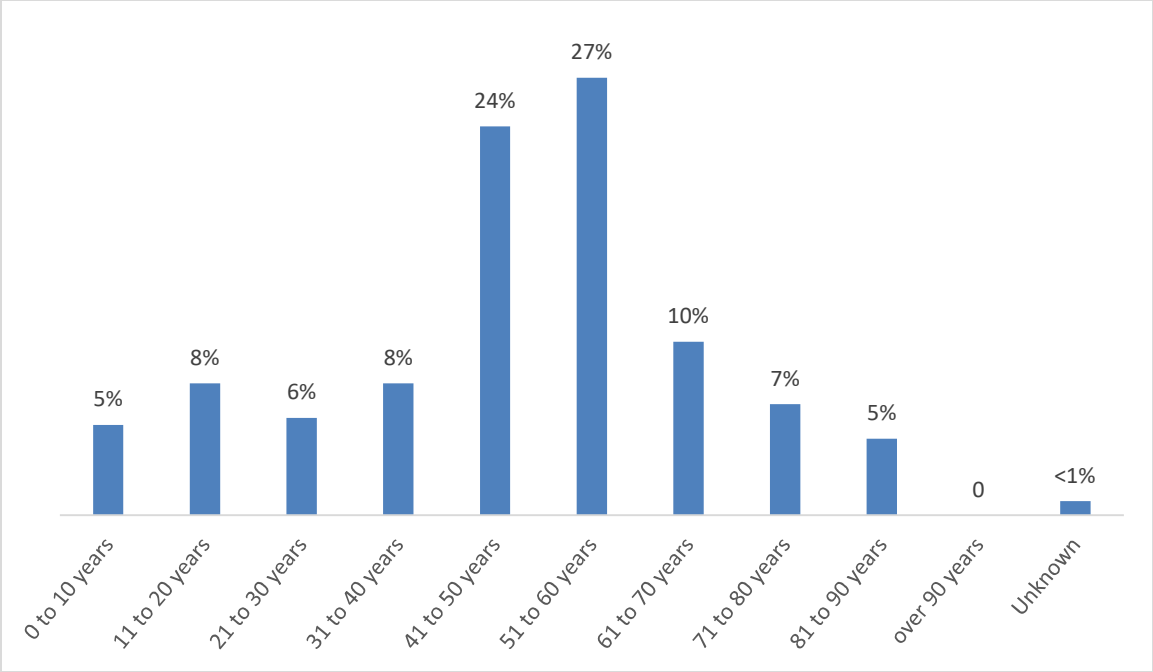

Figure 2.5 Age distribution of 238 patients with papulosquamous disorders

Table 2.8 Papulosquamous disorders

	N	%
Psoriasis	148	62
Lichen planus	71	30
Pityriasis rosea	6	2.5
Pityriasis rubra pilaris	6	2.5
Lichenoid dermatosis	5	2
Ashy dermatosis	2	<1%

Disorders of Pigmentation

In this study, the prevelance of disorders of pigmentation was calculated at 5.3% (CI: 5.1-5.5). The age groups of patients with pigmentation disorders showed two peaks, one in the first decade (20%), the second in the fifth decade (18%). See figure 2.5 below. The median age of patients diagnosed with pigmentation disorders was 46 years.

The gender distribution was females:61%; males:19% and undocumented:20%.

The prevalence amongst the various ethnic groups was Blacks:80%; Whites:13%; Indians:5%; Coloureds:0%. The race group was unavailable for 2% of patients.

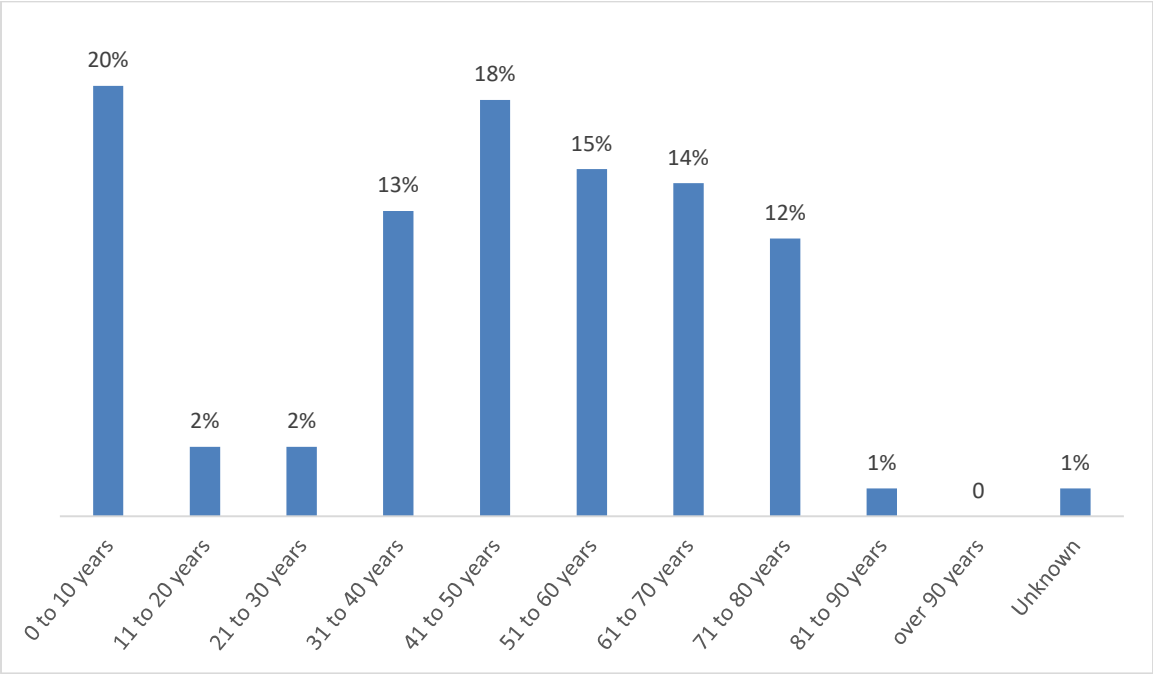

Figure 2.6 Age distribution of 167 patients with pigmentation disorders

Table 2.9 Disorders of Pigmentation

	N	%
Vitiligo	119	71
Chloasma (Melasma)	34	20
Albinism	7	4
Ochronosis	4	2.4
Postinflammatory hyperpigmentation	3	1.8

Discussion

The results of this regional public sector hospital study ratify the findings of recent epidemiologic studies of dermatology in South Africa [3,5]. Adult patients accounted for the majority of our consults (74.1%). In a comparable study Dlova et al had a similar proportion (77.6%) of adults [5]. In South Africa adults comprise 69,5% of the population[12]. The racial breakdown in our study (Blacks 77.2%; Whites 18.3%; Coloureds 0.5% and Indians 3.1%) is reflective of the South African population at large with some minor differences. According to the most recent national census Blacks represent 79.2% of the population; Coloured 8.9%; Whites 8.9%, and Indians 2.5%. The discrepancies in the proportion of Coloured (0.5%) and White patients (18.3%) in this study compared to national figures can be attributed to the racial representations at provincial level. In Gauteng Coloureds account for 3.5% and Whites 15.6% respectively [12]. There were more females than males (ratio 3:2). This "over-representation" of females was consistent across all age groups and is in accordance with data from regional studies [3-5, 13,14]. The median age for females and males was 47 and 45 years respectively.

In keeping with previous studies conducted in public sector hospitals from South Africa, this study has shown that in 3150 patients seen over 4.5-year period, the most common skin diseases were eczema, infectious diseases and acne [3-5]. The comparison of the results of this study with the most recently published South African data[3-5] is presented in Table 2.10 below

Table 2.10. Comparison of the results of this study with previous studies from South Africa published in the last 2 decades

Author	Year	Period of the study	Setting	No. of patients	Ethnicity	Gender	Adults (A) Children (C)	Age (years)	3 most common conditions
Hartshorne[3]	2003	The year 1999 (1 year)	Johannesburg 5 tertiary referral hospitals (public sector)	5355	Black- 76.1% White- 10.9% Indian- 6.7% Coloured- 6.1%	M: 42.1% F: 57.9%	Not available	Blacks: 28.96 Whites: 53.52	Eczemas (31.2%) Infections (22.4%) Acne (16%)
Dlova et al[4]	2015	2003-2010 (8 years)	Durban (private practice)	6664	Black	M: 25.9% F: 74.1%	A: 86.9% C: 13.1%	Adults: 35.5 Children: 11.3	Acne (44.3%) Eczemas (15.9%) Dyschromias (11.6%)
Dlova et al[5]	2018	1January-31 March 2013 (3 months)	Durban 5 tertiary referral hospitals (public sector)	3814	Black- 69% Indian- 24.7% Colored and whites- 6.3%	M: 35% F: 65%	A: 77.6% C: 22.4%	Not available	Eczemas and papulosquamous disorders(41%) Infections (16.5%) Acne and Rosacea (9%)
This Study	2020	6 February 2014-31 August 2018 (4.5 years)	Johannesburg Level 2 regional hospital (public sector)	3150	Black- 77.2% White- 18.3% Indian- 3.1% Coloured- 0.5%	M: 39.5% F: 60.5%	A:75.7% C: 24.3%	Median age: 39 Blacks: 34 Whites: 56 Indians: 67	Eczemas (41.4%) Infections (13.3%) Acne (12.4%)

In our cohort, eczema was the most common diagnosis occurring in 41.1% of all cases (CI: 39.7-43.1). The frequency of eczema in this study is very similar to that documented by Dlova et al (41%) and Hartshorne (31.2%).[3,5] Our patient profile is similar to theirs in that all 3 studies were conducted at public hospitals and included both adults and children.

Eczema was the most common disease in both adults (36%) and children (61.9%) but was more prevalent in childhood. Based on data gleaned mainly from self-administered questionnaires the prevalence of eczema in adults varies between 6-14% [15]. It has been estimated that between 5-20% of children suffer from eczema worldwide[16]. The high prevalence of eczema in younger children can be attributed to the increased number of hospital visits in this age group, reflecting greater parental care; lack of requisite expertise in the primary health care setting or severity of the disease necessitating specialist referral[17].

Eczema was the most common skin disease amongst all ethnicities. Our data did not reflect any racial bias which is consistent with both international and local reports[18]. In a multi-ethnic study in London, United Kingdom eczema was the leading diagnosis in both African and Asian patients and in a local study it was the most common skin disorder in all races [5,19]. Eczema is more prevalent in urban areas and developed countries. The condition appears to be increasing in incidence, specifically in Africa, east Asia and north-western Europe[18]. This increasing incidence is mirrored in our results. Strikingly, in studies from the apartheid era eczemas did not feature as much[20]. In 1970 Dogliotti diagnosed eczema in only 12.9% of his 2000 patients in a Johannesburg public sector referral hospital.[20] Our study shows an increasing trend of eczema comparable to studies conducted in the post-apartheid era at public referral centers.

In the sub-analysis of our patients with eczema, the majority (62.5%) were unclassified with the more common subtypes being seborrheic (16%) and atopic (11.7%). The large number of patients in whom the eczema was unclassified is similar to that described by Hartshorne and Dlova et al (31% and 44.1% respectively)[3,4]. In the study by Hartshorne an unsurprisingly high proportion (32.7%) of patients had the seborrheic variant[3]. This

study was based on data from 1999, prior to the ready availability of antiretroviral therapy (ART) in the public sector. The rollout of ARTs in 2004 has been shown to have a strong impact on the regression of HIV associated seborrheic eczema [21]. Similar to our study, Dlova at al[5] conducted their study in the post-ART era and reported seborrheic dermatitis in 13.4% of their study population with both the studies ratifying the positive effect of ARTs.

The frequency of cases with infectious diseases by Hartshorne[3] in the pre-ART era was 22.4% and by Dlova et al[5] in the post-ART era 16.5%. In our study the prevalence was calculated at 13.3%, which replicates the positive effect of implementing ART in the public sector, and might also be attributed to the socioeconomic improvement described by Dlova et al [5]. The most prevalent infectious diseases in our study were viral infections which were seen in younger patients. Warts were diagnosed in 2.7% of all of our patients, a figure very similar to that reported by Dogliotti (2.25%) in 1970, a study conducted prior to the current HIV epidemic[20]. In support of this finding was the finding by Afesllari et al that there were no significant differences in the size, number, or clinical type of verrucae between HIV-negative patients and HIV-positive patients on ART[22].

Acne was identified in 12.4% of the patients in our cohort. The worldwide prevalence of acne is 9.5% and in recent studies it ranged between 9% and 16% [3,5,23]. The majority (66%) of patients with acne were female. In a descriptive study from the United States of America 65.2% of patients with acne were female [24]. Females accounted for 73.5% of study subjects in a local study describing acne in Blacks attending public sector institutions [25]. These figures suggest that acne is more common in females regardless of race and geography[26].

Acne can occur in neonates but usually begins in the prepubescent stage (7-12 years). The prevalence of acne is believed to decrease with increasing age. In our cohort however, the majority (61%) of patients with acne were between 11 and 40 years of age. This figure is consistent with Hartshorne's and that of Collier et al. where the majority of

patients with acne were adults [3,26]. There is a discrepancy in the literature on the prevalence across age groups due to differences in both diagnostic criteria and study methodology [27]. There are few studies which have directly compared acne prevalence in different ethnic groups but a recent review concluded that the condition occurs commonly in all groups [27]. In our group acne and rosacea were more common in black patients (13.8%) compared to white patients (7.6%). This finding might be explained by the fact that our Black patients had a median age of 34 years which is consistent with the age predilection for acne. On the other hand, the median age in white patients was 56 years, which is an uncommon age group for acne. The finding of steroid induced acne and steroid induced rosacea is presumably seen in black patients who abuse topical steroids for skin lightening purposes. This is a public health matter of concern and is being addressed through patient education.

In our study, 51% of the patients with papulosquamous disorders were seen in the 40 to 60-year age group, in keeping with published data [3]. Psoriasis was the most common papulosquamous disease being diagnosed in 5% of patients. A recent systematic review of the worldwide epidemiology of psoriasis noted the prevalence to be between 0.1% and 5.1%, and in local studies it ranged between 0.65% and 2.9% [3,5,28]. The proportion of females (56%) is likely a reflection of female preponderance in this cohort. A systematic review of the global epidemiology of psoriasis concluded that there was no consensus in incidence rates based on gender [30]. Psoriasis and other papulosquamous disorders (22.4%) were more common in Indian patients in this study, a finding consistent with local data but at odds with the systematic review quoted above which showed psoriasis to be more common in whites [3,5,29].

Vitiligo, the most common pigmentary disorder has a worldwide prevalence ranging from a low of 0.7% to a high of 2.3% [30]. In our group vitiligo accounted for 4% of patients. The figures in previous South African studies ranged between 1.2% and 3% [3,5]. Hospital-based studies have been shown to have a higher prevalence when compared to community studies [31]. As reflected in our results vitiligo has no predilection for race but we did have a disproportionately high number of vitiligo in females in the first and fifth

decades of life. It has been noted that females of all ages seek specialist help more often, likely due to a greater perceived negative social impact of the condition [31].

Limitations of the study

This is a retrospective descriptive study conducted in a single center. Therefore, the results of this study cannot be generalized to the entire South African population.

Due to the retrospective nature of the study, in the majority of the cases the subtypes of the skin diseases were not recorded. We were therefore unable to accurately present the subtypes of common skin diseases in all patients.

The association of HIV and the skin is well established. We could not document this in our study as it was retrospective and HIV results were unfortunately not documented as a routine at our clinic.

Conclusion

This retrospective descriptive study was conducted at a regional hospital over a duration of 4.5 years which makes the results valuable in reflecting the prevalence of skin diseases in our population. The results of this study are largely consistent with recently published epidemiologic data on skin diseases in public sector referral hospitals in the country [3,5]. The statistical comparison of the results within the parameters of gender, ethnicity and age groups highlights the contextual importance of this study. Noteworthy findings are the high prevalence of eczema, a decline in infections overall and the consistent epidemiology of acne. These figures consolidate the shifting trend in the prevalence of skin disorders observed by Dlova et al[4]. Infections which previously predominated have decreased possibly indicative of general improved living condition and improved access to specialist services (like at TMH). We are hopeful that the data generated by this study will contribute to an essential drug list which prioritizes common skin conditions (see Appendix E for our recommendations)and improved access to specialist healthcare.
We have compiled a provisional list, based on our findings and suggest that this could assist towards a national, standardized drug list.

This would apply especially to resource poor settings where the availability of dermatologic treatment is governed by the cost of medications. The finalization of an essential drug list for dermatology requires further engagement with the relevant authorities and is ongoing.

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Chapter 3: Appendices

Appendix A: Patient Data Collection Sheet

Study Number _____

Gender Female □ Male □

Age

Paediatric (<14 years) □ Adult □

Race

Black □ White □ Indian □ Coloured □

Diagnosis

Eczematous Disorders / Dermatitis □

Atopic/Chronic □ Contact Dermatitis □ Seborrheic Dermatitis □ Other □

Sebaceous Disorders □

Acne □ Rosacea □ Hidradenitis Suppuritiva □ Other □

Inflammatory Disorders □

Psoriasis Vulgaris □ Lichen Planus □ Granuloma Annulare □ Ichthyosis □

Other □

Bullous Diseases □

Bullous Pemphigoid □ Linear IGA □ Pemphigus Vulgaris □

Other □

Pigmentary disorders □

Vitiligo □ Melasma □ Albinism □

Other □

Adverse Drug Reaction □

Exanthematous □ Pustular □ Urticarial □ DRESS □

SJS / TEN □Other □

Cutaneous Cancers □

Kaposis Sarcoma □Mycosis Fungoides □ Premalignant Keratosis □ SCC □

Melanoma □BCC □Other □

Infections □

Impetigo □ Erythrasma □ Molluscum Contagiosum □

Erysipelas □ HPV/warts □ HSV □

Syphilis □ Tinea Capitis □ Tinea Pedis □

Tinea other □ Candidiasis □ Sporotrichosis □

Mycetoma □Histoplasmosis □ Cryptococcosus □

Other □

Cutaneous TB □

PNT □ Lupus Vulgaris □ Other □

Disorders of Hair and Nails □

Androgenic Alopecia □ Alopecia Areata □ Traction Alopecia □

Onychomycosis □ Other □

Autoimmune Diseases □

Sarcoid □ Lupus □ Other □

Genodermatoses □

Miscellaneous □

Appendix B: WITS HREC Ethics Clearance Certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

R14/49 Dr Zateen Modi

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M190547

NAME: (Principal Investigator)	Dr Zateen Modi
DEPARTMENT:	School of Clinical Medicine Tambo Memorial Hospital Charlotte Maxeke Johannesburg Academic Hospital
PROJECT TITLE:	A clinical spectrum of dermatological diseases at a regional hospital
DATE CONSIDERED:	31/05/2019
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Kapila R. Hari
APPROVED BY:	CB Penny Dr CB Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	06/06/2019

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on the Third Floor, Faculty of Health Sciences, Phillip Tobias Building, 29 Princess of Wales Terrace, Parktown, 2193, University of the Witwatersrand. I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report**. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in **May** and will therefore be due in the month of **May** each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix C: Tambo Memorial Hospital Approval Letter

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

OFFICE OF THE CEO
Dr. A. Naidoo
Tambo Memorial Hospital
: (011) 898-8317
: (011) 892-0358
: AvisN@gpg.gov.za

MEMO

To : Dr Zateen Modi

From : Dr A Naidoo
Chief Executive Officer

Date : 9 April 2019

Subject : **Request to Carry Out Research at Tambo Memorial Hospital**

This serves to grant permission Dr Zateen Modi to carry out a research study: *A Profile of Dermatology Diseases at a Regional Hospital at* Tambo Memorial Hospital. This permission is granted in light of improving the skill capacity of the Gauteng Department of Health.

The permission is granted in line with the code of ethics or research.

The information of the Gauteng Health Department will be used for the purpose of research and it will be utilized discreetly and confidentiality will be maintained at all times.

The permission is granted in good faith with the notion and understanding that the abovementioned clause is upheld.

Furthermore, there should be no financial implication to the hospital.

The collection of data will be the responsibility of the researcher.

Yours Sincerely,

.....
Dr A Naidoo
Chief Executive Officer

TAMBO MEMORIAL HOSPITAL
DR. A. NAIDOO
2019 -04- 09
CEO
GAUTENG PROVINCIAL GOVERNMENT

Appendix D: Complete List of Skin Diseases Documented

Skin Diseases	N	%
Abscess	1	<0.1
Acne	281	8.9
Acne keloidalis nuchae	1	<0.1
Acne vulgaris	53	1.6
Actinic cheilitis	8	0.3
Albinism	7	0.2
Alopecia	30	1
Alopecia areata	4	0.1
Ashy dermatosis	3	0.1
Atopic eczema	113	3.6
Autoimmune blistering dermatoses	6	0.1
BCC	35	1.1
Bowenoid papulosis	2	<0.1
Bullous pemphigoid	20	0.6
Bullous drug eruption	4	0.1
Burns	1	<0.1
Chronic actinic dermatitis	24	0.9
CCCA (central centrifugal scarring alopecia)	6	0.2
Cheilitis	3	0.1
Chicken pox	3	0.1
Chloasma	34	1.1
Chronic eczema	40	1.2
Chronic paronychia	3	0.1
Chronic urticaria	6	0.2
Contact eczema	20	0.5
Cysts (acne ,sebaceous, others)	1	<0.1
Deep fungal infection	9	0.3
Dermatofibroma	2	0.1
Diaper dermatitis	2	0.1
Discoid lupus erythematosus	25	0.8
DPN (dermatosis papulosa nigra)	4	0.1
Drug eruption	41	1.4
Ecthyma	1	<0.1
Eczema	675	21.6

Epidermodysplasia verruciformis	4	0.1
Epidermoid cyst	2	0.1
Erythroderma	17	0.6
Erythema induratum	2	0.1
Erythema multiforme	9	0.3
Erythema nodosum	4	0.1
Facial eczema	9	0.3
Fixed drug eruption	7	0.2
Frontal fibrosing alopecia	3	0.1
Flat warts	17	0.5
Folliculitis	71	2.2
Foot eczema	2	0.1
Fungal infection	15	0.4
Furunculosis	2	0.1
Genital warts	29	0.9
Genodermatosis	1	<0.1
Haemangioma	1	<0.1
Hand and Foot eczema	6	0.2
Hand eczema	11	0.3
Hand-Foot and mouth disease	3	0.1
Herpes simplex infection	3	0.1
Herpes zoster	3	0.1
Higroma (cystic)	1	<0.1
Ichthyosis	19	0.6
Impetigo	7	0.2
Infantile eczema	42	1.2
Insect bite	2	0.1
Intertrigo	9	0.3
Kaposi sarcoma	29	0.9
Keloid	29	0.9
Lamellar icthyosis	5	0.2
Leukocytoclastic vasculitis	9	0.3
Leucomelanoderma	4	0.1
Leprosy	4	0.1
Lichen planus	65	2.1
Lichen simplex chronicus	51	1.7

Lichenoid dermatosis	7	0.2
Lichenoid drug reaction	6	0.2
Lipodermatosclerosis	4	0.1
Lichen planopilaris	6	0.2
Lichen sclerosus	7	0.2
Lupus Erythematosis	21	0.7
Melanoma	3	0.1
Molluscum contagiosum	83	2.6
Mycetoma	1	<0.1
Mycosis fungoides	3	0.1
Myxedema	1	<0.1
Neck eczema	3	0.1
Neurofibromatosis	6	0.2
Nevus	3	0.1
Nipple eczema	4	0.1
Nodulocystic acne	19	0.6
Nummular eczema	18	0.5
Ochronosis	4	0.1
Panniculitis	1	<0.1
Paronychia	2	0.1
Pellegra	1	<0.1
Pemphigus vulgaris	9	0.3
Pigmented purpuric dermatoses	1	<0.1
Pityriasis rosea	6	0.2
Pityriasis rubra pilaris	6	0.2
Pityriasis versicolor	13	0.3
Poroma (eccrine)	1	<0.1
Postinflammatory hyperpigmentation	3	0.1
Pruritus	16	0.5
Prurigo nodularis	6	0.2
Pseudofolliculitis barbae	5	0.2
Psoriasis	148	4.7
PEP (Polymorphous eruption of pregnancy)	1	<0.1
Purpura fulminans	1	<0.1
Papular Pruritic Eruption of HIV	13	0.4
Rosacea	8	0.2

Sarcoidosis	7	0.2
Scabies	6	0.2
SCC	5	0.2
Scleroderma	3	0.1
Seborrheic dermatitis	208	6.6
Seborrheic keratosis	40	1.3
Syphilis	5	0.2
Skin cancer (Basal cell carcinoma, others)	5	0.1
Skin tags (basal cell papillomas)	16	0.6
Solar keratosis	42	1.3
Sporotrichosis	1	<0.1
Stasis eczema	67	2.1
Stasis ulcers	3	0.1
Steatocystoma multiplex	3	0.1
Steroid induced acne	11	0.3
Steroid induced rosacea	12	0.4
Stevens Johnson Syndrome	13	0.4
Sunburn	2	0.1
Tuberous Sclerosis	1	<0.1
Tinea capitis	31	1.6
Tinea corporis	24	0.8
Tinea faciale	7	0.2
Tinea incognito	18	0.6
Tinea pedis	11	0.3
Ulcers	5	0.2
Urticaria	22	0.8
Vascular malformation	1	<0.1
Vasculitis	6	0.2
Verruca vulgaris	8	0.3
Vitiligo	119	3.8
Warts	30	1
Xanthoma	1	<0.1
Xerosis	11	0.3

Appendix E: Provisional Essential Drug List (EDL) Based on Study Findings

	Drugs currently available (Hospitals with Dermatology services in Gauteng)	Suggested EDL	Comment	NAPPI CODE
ECZEMA	*TOPICALS* Emollients UE 500g PMA 500g	Emollients UE 500g PMA 500g		 802565018 838136001
	Topical steroids DOVATE cream /ointment 25G BETNOVATE cream / OINTMENT 15g	DOVATE cream/ointment 25G BETNOVATE cream /ointment 15g		 807249009 / 807230006 708313019 / 708348009
	PERSIVATE cream/ointment 15g	PERSIVATE cream / ointment 15g		754064018 / 754072002
	CORTODERM cream/ointment 15g		CORTO - DERM cream 15g is not needed if the others listed above are available	716227006 / 716286009
	Betnovate 1:4 in UEA 400g	Betnovate 1:10 in UEA 400g Betnovate 1: 4 in UEA 400G Betnovate 1:10 in PMA 400g Betnovate 1:4 in PMA 400g	Steroid dilutions are rarely available possibly because of the need for compounding.	
		ADVANTAN cream/ointment 20g	Not available anymore Has the benefit of fewer side effects eg less	793108 / 793086

			atropho - genecity	
	SYNALAR gel 30g	SYNALAR gel 30g		768294002
		PROTOPIC cream/ointment 30g	Topical calcineurin inhibitor ointments have a role in children with chronic facial eczema and in both children and adults with adverse reactions from topical steroids	712758001 / 712759001
	SYSTEMIC DRUGS			
	ALLERGEX syrup 100mls	ALLERGEX syrup 100mls		702145010
	PHENERGAN 10mg/ 25mg	PHENERGAN 10mg/25mg		754757005 / 705462005
		ATERAX 25mg	Aterax tablets are no longer available	
		TEXA 10mg	Non sedating anti - histamines are essential for school going children and working adults	703314005
	PRELONE syrup 50mls	PRELONE syrup 50mls		805149023
	ASPELONE syrup 50mls	ASPELONE syrup 50mls		714552001
	PREDNISONE 5mg	PREDNISONE 5mg		788783009
		CELESTONE soluspan 5ml vials	injectable steroids are not available.	711231002

		DEPO MEDROL 2ml vials	Needed for the patients with acute severe eczema.	718475003
	IMURAN 100mg	IMURAN 50mg		732516005
	SANDIMMUNE NEORAL (Ciclosporine) 25mg capsules	SANDIMMUNE NEORAL (Ciclosporine)25mg	SANDIMMUNE NEORAL is available only at the tertiary hospitals and in limited supply.	815918003
		THALIDOMIDE 100mg	Should become available on motivation	709228001
		Biologics eg Omalizumab For refractory cases of atopic eczema	when available in the future at tertiary academic hospitals under motivation	
INFECTIONS Bacterial	*Topicals* CHLOROMEX eye ointment	CHLOROMEX ointment		713724005
		SUPIROBAN ointment 15g (generic of bactroban)		715837001
		NASEPTIN 15g ointment for staph carriers		826294014
		Potassium Permangenate Crystals (condys crystals)	Inexpensive But an ideal antiseptic	756342
	Systemic PURMYCIN 125mg/250mg sus	PURMYCIN 125mg/250mg sus		758396007 / 758418019
		ZITHROMAX P 200 SUS 15mls/30mls	ZITHROMAX P SUS is not available	830720006 / 830720014
		PURMYCIN125mg/250 mg		758396007 / 758418019

Viral	ZITHROMAX 500mg tablets (3s)	ZITHROMAX 500mg tablets (3's)		832278009
	CLOXIN 250mg/500mg cap	CLOXIN250mg/500mg		809632012 / 809640015
		Cephalosporine syrups and tablets e.g. CIPROHEXAL	Cephalo - sporine syrups and tablets are not readily available for dermatology patients	
		Penicillin e.g. Pen VK 250mg or 500mg Penicillin injectables PENILENTE LA 2.4 M Units	Inexpensive but not available Ideal for patients with syphilis BUT no longer available	753521008
	DOXYCYL CAP 100mg	DOXYCYL CAP 100mg	Now used routinely for STDs	809667029
		ZOVIRAX eye 4.5 G ointment	Not available	779407008
	ALDARA sachets	ALDARA sachets		851884008
		PODOPHYLLIN (powder) e.g. 20% podophyllin in TBCo	Inexpensive BUT unavailable Would be ideal for Genital warts	
	ZOVIRAX 200mg sus 125mls	ZOVIRAX 200mg sus 125mls		789313006
	ZOVIRAX tablets	ZOVIRAX tablets 200mg		838225004
		FAMVIR 125mg/250mg	FAMVIR is easier to prescribe re : compliance as	826715001/815853009

			it is given three times a day compared to acyclovir	
Fungal	*Topicals*			
		Whitfields ointment	Not available Inexpensive yet effective	
	NYSTATID UNG 15g	NYSTATID UNG 15g		797022007
	CANDIZOLE TOP cream/ointment	CANDIZOL cream /ointment		797006001
		PEVARYL cream 30g	More broad spectrum against candida and dermatophytes	754498026
		LAMISIL 1% 15g	Not available	792705009
	Systemic			
	NYSTATID oral DRP	NYSTATID oral DRP	A Much needed drug for tinea capitis which is Not available	835285006
		MICROCIDAL 125mg tab		729566005
	Austell – FLUCONAZ 150mg	Austell-FLUCONAZ 150mg	Always in short supply	704357001
	SPORONOX 100mg caps	SPORONOX 100mg caps	Ideal for Onychomycosis	786322004
		LAMISIL 250mg tabs	But unavailable	792713001
Parasitic				
		POTASSIUM IODIDE	Not available , Inexpensive	

			Ideal for Deep fungal infections	
	ASCABIOL lotion	ASCABIOL Lotion		704857
		2% or 4% or 5 % sulphur in UEA or PMA	Always in short supply Not always available Ideal for scabies in various age groups	
		SKABIRID (PERMETHRIN)	NOT AVAILABLE Ideal for scabies and lice	713148
	Systemic ZENTEL 200mg/ml SUS ZENTEL 400mg tab	ZENTEL 200mg/ml SUS ZENTEL l 400mg tab		789720019 712381001
		BILTRICIDE (Praziquental 600mt)	Would be ideal and cost effective long term	708607004
		IVERMECTIN	Should become available on motivation	
ACNE	*Topicals* BENZAC -AC 5 gel 15G	BENZAC- AC gel 15G		807842029
	RETIN A CREAM 20g		RETIN A is an “irritant “on black skins esp with the highveld climate.	760242003
		DIFFERIN.1% gel 30g	DIFFERIN would be cause less skin irritation	827215002
	2% SULPHUR in UEA	4% SULPHUR in UEA	4% would be more suitable	

			for patient with Rosacea	
		ROSEX gel 30g	ROSEX gel : ideal for fair skin patients with rosacea	
	Systemic drugs DOXYCYL 100 MG	DOXYCYL 100MG		809667029
	PURBAC 480MG	PURBAC 480 MG		758248016
	DIANE 35	GINETTE 35	The generics of Diane 35 would be more cost effective allowing a bigger supply	897214005
	ORATANE 20MG	ACNETRET 10MG	Acnetret is the cheapest Isotretinoin of all the generics Roaccutane and Oratane are available in limited supply because of cost	711877001
Papulo - sqamous disorders PSORIASIS	*Topicals* All the steroids listed above as for eczema	Topical steroids listed above		
	Liquid paraffin	Liquid paraffin DOVOBET ointment 30g DOVONEX ointment 30g BETNOVATE scalp lotion or	For severe scales on scalp Not available Ideal for intertriginous areas	708636001
		XAMIOL gel 30G	Not available Ideal for scalp psoriasis	7171911001

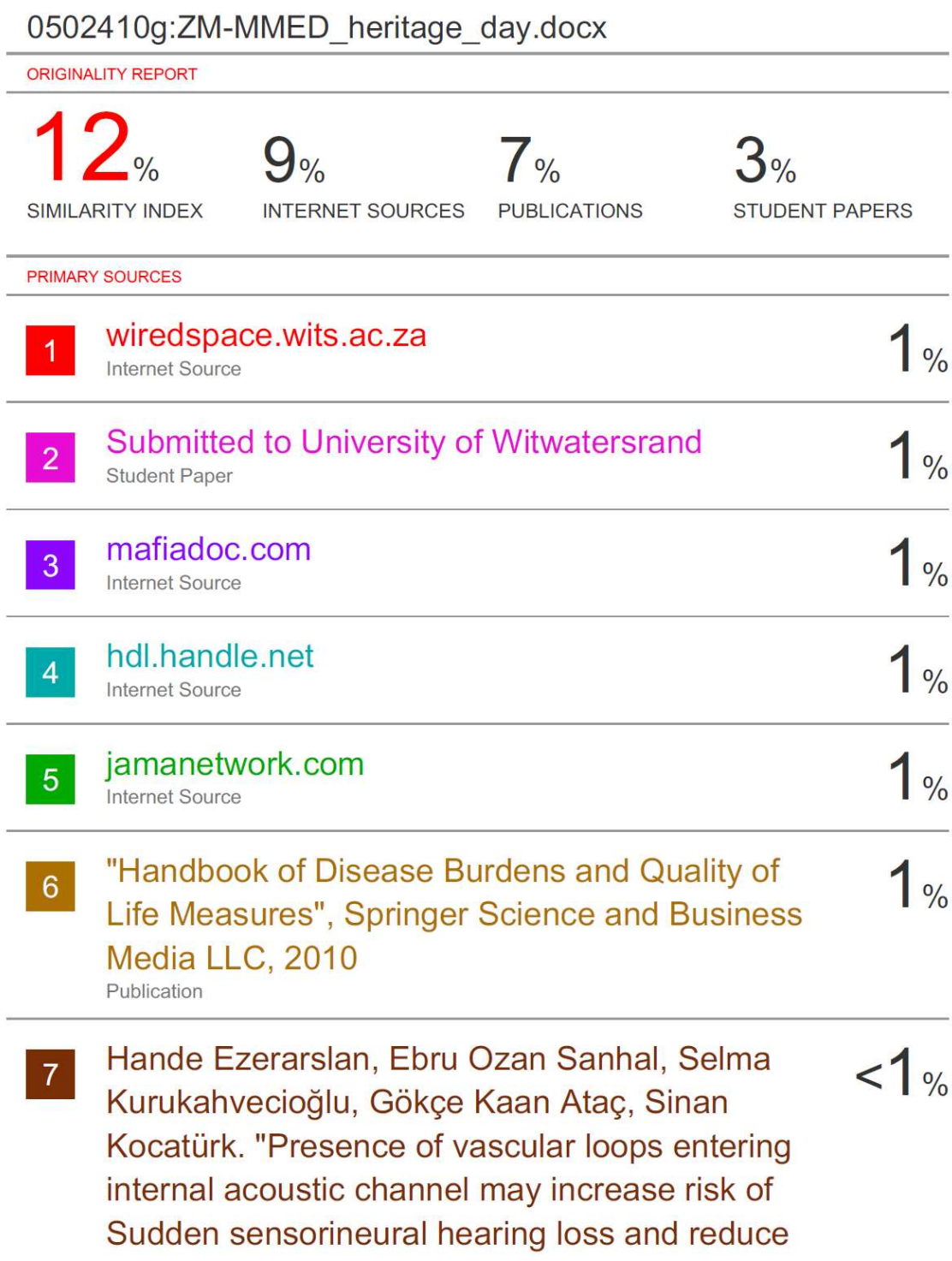
	Systemic	CELESTONE soluspan 5ml vials		711231002
	METHOTREXATE 2.5MG	METHOTREXATE 2.5MG	For thick plaques and nail psoriasis	742465004
	NEOTIGASON 10MG/25MG	NEOTIGASON 10MG/25MG		817740007
	NEORAL SANDIMMUN	NEORAL SANDIMMUN		815918003
		Biologics e.g. STELLARA	Should be available at tertiary academic hospitals under motivation	
Lichen Planus	*Topicals*	OXSPORALEN 5mg tablets	Should be available if PUVA is considered for the patient	
	Topical steroids as listed for eczema	Topical steroids listed above		
		KENELOG IN ORABASE 30g		
	Systemic	CELESTONE SOLUSPAN or equivalent intralesional steroid	Not available anymore Ideal for oral lichen planus	711231002
	PREDNISONE	PREDNISONE		
	NEOTIGASON SANDIMMUNE NEORAL	NEOTIGASON		
	CICLOSPORINE	CIclosporine used as a mouth wash		
Pityriasis Rubra Pilaris	Topical steroids and retinoids listed above	Topical steroids and retinoids listed above (Neotigason)		

Disorders of pigmentation Vitiligo	All topical steroids listed above PREDNISONE	All topical steroids listed above PREDNISONE OXSPORALEN 5mg tablets	Not available Needed for PUVA treatment of vitiligo	
Reactive dermatoses	Topical and systemic Antibiotics listed above	Topical and systemic antibiotics listed above		
Benign skin tumours Multiple Solar keratosis	Standard Surgical equipment	Standard surgical equipment EMLA 5 % CREAM & PATCH Topical and systemic ALA (Amino laevulinic acid)	Would be ideal for minor surgical procedures especially for children (excision warts and mollusca) Should be available at all tertiary and academic hospitals for performing PDT (Photo Dynamic Therapy). This is currently not available at Gauteng academic hospitals	826367011 / 840106009
Malignant skin tumours E.g. superficial basal cell carcinomas Premalignant solar keratosis and clinically suspected Squamous cell carcinomas Bowens disease	ALDARA sachets EFUDIX ointment 30G	ALDARA sachets EFUDIX ointment 30G	Should be available at all tertiary hospitals Should become available at regional hospitals	851884008 722367

Connective Tissue Diseases	Topical and systemic steroids As listed above PLASMOQUINE 200 METHOTREXATE 5MG CELLCEPT 250MG TAB IMURAN 50 CYCLO - PHOSPHAMIDE (ENDOXAN)	Topical and systemic steroids Celestone 5ml vials Depo Medrol for intramuscular injection PLASMOQUINE 200 METHOTREXATE 5MG CELLCEPT 250MG TAB IMURAN 50 CYCLO - PHOSPHAMIDE (ENDOXAN) THALIDOMIDE BIOLOGICS e.g. MABTHERA	Not available at regional outpatient clinics Should be available at academic centres on motivation	794333001 742465004 833630 707162001 732516005 723274
Hair disorders	SYNALAR GEL BETNOVATE SCALP LOTION RETIN A cream PREDNISONE NEOTIGASON NEORAL SANDIMMUN	SYNALAR GEL BETNOVATE SCALP LOTION RETIN A cream /ointment Intralesional steroids Celestone soluspan 5ml vials Prednisone 5mg tablets Neotigason 10mg /25mg	NOT AVAILABLE Not available at clinics	NAPPI CODES AS ABOVE
Bullous disorders	Topical / systemic steroids All Immunosuppresives LISTED ABOVE	Topical and systemic steroids All immunosupressives LISTED ABOVE Biologics e.g. Rituximab MABTHERA 100MG INJ	Rituximab should be available on request and motivation	853232008
OTHERS URTICARIA	ALLERGEX	ALLERGEX		

	PHENERGAN NEORAL SANDIMMUN	PHENERGAN TEXA 10 NEORAL SANDIMMUN BIOLOGICS EG. XOLAIR (Omalizumab)	Not available Not available at clinics Need non-sedating antihistamines Should be available at tertiary centres on request for CHRONIC IDIOPATHIC URTICARIA	
Chronic panniculitis		POTASSIUM IODIDE	Not available. HIGHLY EFFECTIVE THERAPEUTIC DRUG	
Granulomatous Disorders	Drugs are listed above	All drugs above apply		
Cutaneous TB	RIFAFOUR E-275	RIFAFOUR E-275 All immunosuppressives listed above	Should become available on request	701608006
Cutaneous Sarcoid		Biologics e.g. MABTHERA		
HIV Dermatology			Treatments are Multi - disciplinary	

Appendix F: Turnitin Report



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