Dermatology is an outpatient-centred specialty frequently dealing with non-acute medical conditions.\textsuperscript{[1]} However, dermatologists admit and manage patients who are severely ill and/or have complicated cutaneous diseases.\textsuperscript{[2]} The reasons for dermatology inpatient admission can range from the severity of the disease and comorbid diseases to lack of transport and psychosocial support.\textsuperscript{[3-6]} However, dermatology inpatient services are not only required by primarily dermatology-admitted inpatients, as inpatients in other disciplines also benefit from dermatology consultation services.\textsuperscript{[7]}

Dermatology input on the consultation service improves the early and correct diagnosis and appropriate management of cutaneous issues in addition to minimizing unnecessary investigations.\textsuperscript{[8-9]}

Previous studies indicate that demographic and clinical indications for inpatient dermatology management differ between study settings and the period of study.\textsuperscript{[7]} In South Africa (SA), a younger population is admitted compared with developed countries such as Australia and the UK.\textsuperscript{[10,11]} Furthermore, in Australia, dermatitis or eczema and ulcers were the most frequent indications for admission,\textsuperscript{[12]} whereas in India, immunobullous disorders, connective tissue diseases and infections accounted for the majority of admissions.\textsuperscript{[13-14]} In Spain, surgery was the most common indication for dermatological admissions.\textsuperscript{[8,15]} In contrast, atopic dermatitis, extensive psoriasis and severe drug reactions accounted for the majority of dermatology admissions in Cape Town, the largest metropolitan area in the Western Cape Province of SA.\textsuperscript{[16]} A slightly different admission profile was observed in Durban, KwaZulu-Natal Province, where drug-induced Steven Johnson syndrome, dermatitis and seborrhoeic dermatitis were among the most common indications for admission.\textsuperscript{[17]} No study on dermatology inpatient consultations has been done in SA. However, it can be expected that different specialties and cutaneous conditions might be observed, as has previously been shown in other settings.

Currently, there is a dearth of information on the characteristics of patients managed by dermatologists in the hospital inpatient service in SA, particularly in KwaZulu-Natal.\textsuperscript{[18]} In this study we set out to describe the clinical spectrum of inpatient dermatology diseases managed at a quaternary SA hospital. We also aimed to describe the age, gender and outcomes of dermatology admissions. In addition, we also characterise the patients managed in the dermatology consultation service. This is important for health services planning and infrastructure provision.\textsuperscript{[19]}

**Methods**

**Study design and setting**

We carried out a single-institution, retrospective chart review of all hospital inpatients treated by dermatologists from 2015 to 2020 at Inkosi Albert Luthuli Central Hospital (IALCH) in Durban, KwaZulu-Natal, SA. This is a quaternary referral and teaching hospital. It caters for referrals from the tertiary and other hospitals in the province providing specialist and subspecialist service under
four main domains/disciplines, namely surgery, medicine, mother-
and-child care and the perioperative services. We included any
patient who had at least one admission during the study period
meeting one of the following criteria: inpatient admission, or
discharge department was dermatology and/or had an inpatient
stay with a dermatology International Classification of Diseases
(ICD) code, and/or inpatient stay included occupancy of a bed in
dermatology with a dermatology ICD code, capturing dermatology
inpatients and consultations. All dermatology diagnoses were taken
at the ICD hierarchy level 3.

Statistical analysis
Convenience sampling was done for the current study. A data
analyst from the IALCH information technology department
assisted in extracting the required demographic and clinical data
from MEDITECH 6.15 electronic medical records system into an
Excel sheet (Microsoft Corp., USA). The following demographic
data were collected: patient age, gender, race, referring clinical
facility and patient’s payer type. Clinical data on the ICD 10
dermatology diagnosis at the hierarchy level 3 for the chosen
admission and the associated admitting specialty and/or discipline
were also collected. The data were then analysed using the Statistical
Package for Social Sciences (SPSS) version 22.0 (IBM Corp., USA).
Descriptive statistics such as frequencies and percentages were used
to summarise categorical variables, while continuous variables were
described using either means and standard deviations or medians
and the interquartile range (IQRs), as appropriate. Comparisons
of count data were done using the χ2 or Fisher’s exact tests as
appropriate, whereas comparisons of continuous data were done
using the independent Student t-test. All analyses were done at the
0.05 significance level.

Ethical considerations
The study was approved by the IALCH ethics committee and the
University of KwaZulu-Natal’s Biomedical Research Institutional
Review Board (ref. no. BREC/00004454/2022). All patient
information was de-identified and patient confidentiality was
maintained by using unique study patient identification numbers.
No informed consent was obtained from participants as this is a
database study.

Results
A total of 4 867 patients were managed by the dermatology service
during the study period. Of these, 183 (3.8%) were dermatology
inpatient admissions whereas the remainder, 4 684 (96.2%), were
seen as consults from other specialties. The trends of dermatology
inpatient admissions over the study period are shown in Fig 1. The
median (IQR) age of the study population was 42.0 (28.0 - 58.0)
years. Females accounted for 2 527 (51.9%), while black African,
coloured, Indian/Asian, white and unclassified patients constituted
3 146 (64.6%), 106 (2.2%), 1 129 (23.2%), 431 (8.9%) and 55 (1.1%),
respectively.

Characteristics of dermatology inpatient admissions
The median (IQR) age of the dermatology inpatients was 37 (23.00
- 52.00) years. The median (IQR) number of admissions for the
dermatology inpatients was 1.00 (0; 18.00). Most of the admitted
patients were females (Table 1). Bullous diseases – pemphigus and
pemphigoid – were the most common dermatological diagnoses
in those admitted. The spectrum of dermatological conditions
managed on the inpatient service is shown in Fig 1.

Characteristics of dermatology consultation service
Dermatological consultations were received from a wide range
of disciplines, as indicated in Fig. 2. The median (IQR) age of
the patients in the consult service was 42.0 (29.0 - 58.0) years,
and there was a slight female preponderance at 2 425 (51.8%).
Females also predominated in the medical (58.2%) and mother-
and-child (97.2%) disciplines, whereas males predominated in
the perioperative (34.8%) and surgical (44.7%) disciplines.
The most common conditions necessitating consults to dermatology
were the cutaneous abscess, furuncle and carbuncles grouping of
diagnoses (464 (10.8%)), followed by cellulitis (426 (9.09%)) and
decubitus ulcers (403 (8.60%)). The remainder constituted other
ICD dermatology diagnoses and/or combinations thereof (Fig. 2).
Most of the consults were observed from the surgical discipline,
accounting for 2 430 (51.9%), followed by medicine (1 616 (34.6%),
the perioperative discipline (356 (7.6%)) and finally the mother-
and-child discipline (282 (6.0%)). The most frequently requesting
specialties were plastic surgery (1 010 (21.6%)), nephrology (252
(5.4%)) and haematology (241 (5.1%)) (Table 2). Consults were seldom
requested from paediatric surgical subspecialties.

Discussion
In this study we describe the clinical spectrum and characteristics
of inpatient dermatology diseases managed at a quaternary SA
hospital. As expected, >90% of all dermatology inpatient services are
offered in the consultation service, with only 3.8% being managed
as dermatology inpatients. The median (IQR) age of the study
population was 42.0 (28.0 - 58.0) years. Dermatology-admitted
inpatients were younger than patients managed in the consultation
service, with median ages of 37 years and 42 years, respectively.
Females predominated in both the dermatology-admitted inpatient
and the consultation services, with 55.7% and 51.8%, respectively.
Moreover, females predominated within the medical and mother-
and-child disciplines, in contrast with the perioperative and surgical
disciplines, where males predominated. Differences were noted for
the most prevalent diseases managed within both populations.
The top three dermatology diagnoses managed in the inpatient
service were pemphigus, bullous pemphigoid and psoriasis, while
bacterial infections – abscesses, furuncles, carbuncles, cellulitis and
decubitus ulcers – predominated in the consultation service.
In recent years, there has been a paradigm shift toward greater
provision of dermatology services in outpatient settings, possibly
owing to the advent of effective outpatient treatments and as a
cost-reduction measure. However, inpatient dermatology services
are essential for the correct diagnosis and management of often
unattended, previously existing cutaneous conditions seen in patients admitted for other reasons. Within our hospital,
consultations from other departments predominate the inpatient
workload for our dermatologists, as observed in other countries.
Unlike in other studies, the discipline of surgery, mostly
through the plastic and reconstructive department, had the
greatest need for the dermatology consultation service. This may
be explained by common diseases encountered or managed
by dermatology and plastic surgery, such as cutaneous malignancies
and keloids. The less surgically demanding lesions tend to be
referred to dermatology, and vice versa, at our facility. Unlike in
other studies, general internal medicine and general surgery
were not the main referring disciplines, as these specialties are not
present at our facility.
The order of consultations from other specialties was largely
similar to that found in other studies, especially for internal
The most common cause of admission in our dermatology wards was severe, uncontrolled immunobulbous disorders, both the pemphigus and pemphigoid groups of diseases. These findings are similar to those reported in Indian hospitals, but they differ from those from Australia and Brazil, where eczema/dermatitis predominated dermatology admissions. These findings also differ from results from Spain, which indicate neoplasms as the main cause of admission, possibly due to the increased focus on dermatological surgery in their service. Furthermore, unlike findings in India and Brazil, we had few infective indications for admission by the dermatology team. Likewise, our current findings also differ from previous observations in our setting, where cutaneous adverse drug reactions such as Stevens-Johnson syndrome and toxic epidermal necrolysis predominated the dermatology admissions during a period when our antiretroviral regimens consisted of non-nucleoside reverse transcriptase inhibitor drugs such as nevirapine and efavirenz. This shows that admission trends may vary depending on other conditions being managed and/or prevalent in the community at the time. Unlike the findings of Sen et al. in India, where the median age of the dermatology admitted inpatients was in the fifth decade, we found a younger inpatient population in our study. In the same study by Sen et al., males outnumbered females, demonstrating that patient characteristics and dermatology services are different in different countries.

The major strength of this study is the large sample size, taken over 5 years, which gives a broader reflection of the contribution of inpatient dermatology services within a quaternary teaching hospital. We have demonstrated the dermatology consultation services offered to other departments, and the need to recognise the requirement for these services within any hospital set-up. Furthermore, we delineated the diseases warranting dermatology admission and necessitating dermatology consultations from other disciplines. These findings should assist health planners by providing evidence of the utility of dermatology, not only to primarily dermatology-admitted patients, but to other specialties for the provision of holistic care to patients. The continuing downsizing of dermatology services and residency programmes in several hospitals shows an underappreciation of the impact of the specialty, especially from the dermatology consultation service offered to other specialties. However, the principal limitation of the current study is its retrospective nature, which causes information bias.

**Conclusion**

Even though dermatology is mostly considered an outpatient service, many inpatients benefit from dermatology services, especially through its consultation service. Most consultations were received from plastic and reconstructive surgeons, while bacterial infections, decubitus ulcers...
Fig. 2. Spectrum of top dermatological diagnoses in the consultation service (N=147).
and lower limb ulcers were the three most common referred diagnoses overall. Dermatology consultations should be promoted as they reduce hospitalisation costs and improve outcomes in patients with concomitant skin diseases admitted by other specialties.[20] This is especially so for patients with cutaneous manifestations of internal diseases not otherwise easily diagnosed by other specialties.[14] This also offers an opportunity to educate and improve dermatology diagnosis for primary referring specialties.[14] This is especially important given that the burden of cutaneous diseases in the hospital is great, and the expertise regarding the recognition and management of these disorders is limited outside the specialty.[14]

Declaration. This study project was led by LM and done in partial fulfilment for her MMed Dermatology degree at the University of KwaZulu-Natal under the main supervision of AM.

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Author contributions. LM and JM conceptualised, designed and collected the data for the study. JM performed statistical analyses. Both LM and JM drafted the manuscript with AM and KD revising the manuscript for clinical validity. All authors read and approved the final version of the manuscript.

Funding. None.

Conflicts of interest. None.

Table 2. Referring discipline and the most frequent dermatology diagnosis by specialty

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Specialty</th>
<th>Consults, n</th>
<th>Most common diagnosis</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine</td>
<td>Cardiology</td>
<td>194</td>
<td>Psoriasis</td>
<td>54 (27.8)</td>
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<td></td>
<td>Gastroenterology</td>
<td>115</td>
<td>Pruritus</td>
<td>36 (31.3)</td>
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<tr>
<td></td>
<td>Geriatrics</td>
<td>25</td>
<td>Decubitus ulcers</td>
<td>8 (7.0)</td>
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<tr>
<td></td>
<td>Haematology</td>
<td>159</td>
<td>Cellulitis</td>
<td>39 (24.5)</td>
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<tr>
<td></td>
<td>Neurology</td>
<td>236</td>
<td>Decubitus ulcer</td>
<td>46 (19.5)</td>
</tr>
<tr>
<td></td>
<td>Nephrology</td>
<td>252</td>
<td>Cellulitis</td>
<td>33 (13.1)</td>
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<tr>
<td></td>
<td>Oncology</td>
<td>176</td>
<td>Pruritus</td>
<td>23 (13.1)</td>
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<td></td>
<td>Pulmonology</td>
<td>125</td>
<td>Psoriasis</td>
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<td>Rheumatology</td>
<td>241</td>
<td>Vasculitis</td>
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<td>20 (25.6)</td>
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<td>Ear, nose and throat</td>
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<td>Neurosurgery</td>
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<td>Decubitus ulcer</td>
<td>59 (26.3)</td>
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<td>Orthopaedics</td>
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<td>Ophthalmology</td>
<td>53</td>
<td>Cellulitis</td>
<td>15 (28.3)</td>
</tr>
<tr>
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<td>Plastic surgery</td>
<td>1010</td>
<td>Decubitus ulcer</td>
<td>209 (20.7)</td>
</tr>
<tr>
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<td>Urology</td>
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<td>Ulcer of lower limb</td>
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<td></td>
<td>Vascular</td>
<td>424</td>
<td></td>
<td>235 (55.4)</td>
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<tr>
<td>Mother and child</td>
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<td>Acanthosis nigricans</td>
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<td>Impetigo</td>
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<td></td>
<td></td>
<td>Acanthosis nigricans</td>
<td>12 (12.1)</td>
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<td>Atrophic disorders of skin</td>
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<td></td>
<td>Critical care</td>
<td>187</td>
<td>Decubitus ulcers</td>
<td>42 (22.5)</td>
</tr>
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</table>


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