SHORT COMMUNICATION



# Avoidable Injuries in 1,211 Patients with Dermatological Diagnoses in Claims to the Swedish National Patient Insurance Company during 2016 to 2020

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The occurrence of adverse events due to unsafe care is a significant global issue, ranking among the top 10 causes of death and disability worldwide. Common errors leading to harm include medication errors, diagnostic errors, healthcare-associated infections, and unsafe surgical procedures. Patient safety aims to prevent and reduce risks, errors, and harm in healthcare provision (1). Continuous improvement and learning from errors are fundamental. In dermatology, few studies have been carried out to assess the extent and impact of medical errors and ways to improve patient safety (2–4).

In Sweden, healthcare is managed by 21 county councils organized into 6 healthcare regions. Dermatological care is predominantly provided in primary care and specialized outpatient settings, with greater accessibility in larger cities such as Stockholm, Gothenburg, and Malmö. The Swedish National Patient Insurance Company (Löf) is a mutual insurance company owned by all Swedish county councils, administering the mandatory Swedish patient insurance outlined in the Patient Injury Act (SFS 1996:799). This insurance supplements the Swedish social insurance system by compensating patients for financial losses resulting from avoidable injuries in healthcare. Patients or their representatives can file claims with Löf, and healthcare providers are obligated by the Patient Safety Act (SFS 2010:659) to inform patients about Löf in case of adverse events.

Claims filed with Löf are entered into a database, containing nearly 295,000 claims from 2000 to 2022. According to the Patient Injury Act, compensation is allowed for injuries resulting from examination, care, treatment, or similar procedures if they could have been avoided by choosing a different approach or procedure with the same effect but lower risk. Diagnostic errors, including wrong, delayed, or missing diagnoses, are evaluated retrospectively by medical experts based on professional standards at the time of injury. Compensation is likely if professional standards were not followed and if there are medical or psychological consequences from the injury.

The study aimed to describe the pattern of injuries in Swedish dermatology reported by patients with skin diseases and tumours and determine the extent to which they were considered unavoidable.

## MATERIALS AND METHODS

The claims database at Löf was retrospectively searched for claims registered from 1 January 2016 to 31 December 2020 and with ICD-10-SWE-codes C43.x–C44.x (malignant skin tumors), D03.x–D04.x (malignant melanoma in situ), D22.x–D23.x (benign skin tumours), L00.x–L99.x (dermal diseases), and R 20.x–R23.x (symptoms from skin and subcutis). The diagnosis L90.5 (scar after previous surgery) was excluded. Only patients who have given permission to use their claims for research were included. This search resulted in 3,208 claims that were further analysed.

The data are pseudonymized and the key is stored at Löf without access to the researcher. Data are saved for 10 years to enable possible follow-up questions in connection with the presentation of data. Research data are archived at Karolinska University Hospital. The study was approved by Swedish Ethical Review Authority 2022-06250-02.

## RESULTS

Between 2016 and 2020, Löf received a total of 84,508 claims, with 44% (37,170 claims) settled and compensated by 1 January 2021. Some 3,208 claims (2,012 female and 1,196 male, median age 43 years, range 0–95) met the inclusion criteria for this study. The distribution of claims, compensations, and their relation to the population size in different healthcare regions is detailed in **Table I**. Region Middle had the highest number of settled claims ($n = 299$), while Region North had the lowest ($n = 115$). Region Southeast had the highest number of settled claims per million inhabitants (155/million) compared with the lowest number found in Region Stockholm-Gotland (85/million).

Of the 3,208 claims, 1,663 were related to hospital care (759 inpatients, 173 in A&E departments, and 731 outpatients), 1,217 to primary care, 265 to other care fa-

**Table I. Distribution of claims (all and settled) to LÖF based on gender and the six Swedish healthcare regions**

| Factor | All claims ($n = 3,208$) *n* (%) | Settled claims ($n = 1,211$) *n* (%) | |
|---|---|---|---|
| Sex | | | |
| Female | 2,012 (62.7) | 751 (62) | |
| Male | 1,196 (37.3) | 460 (38) | |
| Region (million inhabitants) | *n* (%)/million | *n* (%)/million | Settled/ claims |
| Stockholm/Gotland (2.52) | 610 (19.0) 242 | 213 (17.6) 85 | 35% |
| South (1.93) | 482 (15.0) 249 | 170 (14.0) 88 | 35% |
| West (1.97) | 612 (19.1) 310 | 243 (20.1) 123 | 40% |
| Southeast (1.10) | 405 (12.6) 368 | 171 (14.1) 155 | 42% |
| Middle (2.15) | 761 (23.7) 353 | 299 (24.7) 139 | 39% |
| North (0.9) | 338 (10.5) 375 | 115 (9.5) 128 | 34% |

Data are presented as number of claims and percentages of total number of claims and settled claims per region, as well as number of claims and settled claims related to population.

cilities (often private outpatient dermatology), and 63 to dental care. The most common diagnostic groups among the claims were dermal diseases ($n=1,379$), benign skin tumours ($n=258$), and malignant skin tumours, including malignant melanoma in situ ($n=225$).

A total of 1,211 (38%) claims were deemed avoidable and were settled, 751 (63%) female and 460 (47%) male, median injury age 44 years, range 0–94); 521 occurred in hospital care, 582 in primary care, 104 in other care facilities (often private outpatient dermatology), and 4 in dental care.

Diagnostic errors were the most common cause of avoidable injuries, followed by procedure-related errors, with surgical procedures being the most frequent (**Table II**). The most common diagnoses among patients with diagnostic errors were medical dermatological conditions, followed by skin tumours such as malignant melanoma (**Table III**). In 175 of the 643 patients with a diagnostic error, the consequence of the error was either invalidity or death, as compared with 96 of 568 patients where the cause was other than a diagnostic error.

## DISCUSSION

This is the first investigation of patient-reported claims concerning dermatological healthcare in Sweden and several new observations are made to support further work.

A minority of the claims to Löf were from patients with dermatological disorders. Knowledge among healthcare staff of the responsibility to inform patients as well as patient-related factors such as socioeconomic background, language, and education status are factors to influence reporting.

Women were overrepresented among patients who filed claims, and in the number of settled claims, in line with previous reports by others (5, 6). Sex and gender also influence the epidemiology of skin diseases, and are thus important factors to consider for the ability of healthcare providers to provide individualized care as recently reviewed (7).

We found previously not described regional differences in patient-reported injuries in dermatology. Assuming that accessibility to both primary care and specialized dermatological care is largest in the capital and urban areas, it is interesting that the lowest rates of claims and settled claims were found in these regions. This could be due to safer dermatological care or that the different socioeconomic factors and the complex care processes of larger cities make it more difficult for patients to file claims to Löf.

**Table II. Five most common causes as reported for settled claims**

| Cause | *n* (%) |
|---|---|
| Diagnostic errors | 643 (53%) |
| Surgical interventions | 228 (19%) |
| Medical interventions | 124 (10%) |
| Performing an inadequate operation | 114 (9%) |
| Other specified mishaps during surgical and medical treatment | 61 (5%) |

Data are presented as number of patients and percentages, rounded off to integers.

**Table III. Final diagnoses in the 643 patients with diagnostic error in settled claims**

| Diagnosis | *n* (%) |
|---|---|
| Malignant ($n=208$), unspecified ($n=12$), and benign ($n=8$) skin tumours | 228 (35%) |
| Other (haematologic, orthopaedic, gyneacologic, ophthalmologic, neurologic, rheumatologic diseases) | 103 (16%) |
| Infection | 88 (14%) |
| Dermatological diseases | 72 (11%) |
| Stress reaction | 55 (9%) |
| Vascular diseases | 48 (7%) |
| Scabies | 32 (5%) |
| Borrelia infection | 17 (3%) |

Data are presented as number of patients and percentages rounded off to integers.

Diagnostic errors was the most common cause in the 1,211 avoidable injuries. Staff-reported procedural errors and prevention methods like checklists have been highlighted in patient safety work in dermatology. But diagnostic errors are more common, costly, and harmful than any other patient safety threat and primary and open care is particularly liable to diagnostic error (8, 9). Considerable consequences for the patients were found, with medical invalidity or death being more common than other causes in the group of diagnostic errors. The ongoing implementation of knowledge-based Policy of Health Care aims for national decision support tools to obtain equal healthcare despite the regional organizational differences. Based on our findings, the tools should include specific recommendations regarding referral and differential diagnostic consideration to make the diagnostic process as safe as possible.

To prevent diagnostic errors, technology, such as dermatoscopy and AI algorithms, offers promising avenues for improvement, although it introduces new challenges (10, 11). System changes, some of them possible to implement without large costs, are also needed. Cognitive methods, including systematic review of diagnoses and an open culture for collegial discussions, are essential. Some examples suggested by general practitioners were to communicate abnormal results of investigations to patients, direct hotlines to specialists for discussions of patient problems, and better training of primary care clinicians in relevant areas (8).

In summary our report highlights diagnostic errors as an important cause of avoidable patient-reported injuries with serious consequences and the critical need for structured diagnostic procedures and inter-level care processes in dermatology. The findings underscore the importance of patient-reported injuries for quality improvement in dermatology

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