Interpreting the global burden of disease 2023 dermatology estimates: Best practices, caveats, and limitations for researchers and clinicians

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Key words: acne vulgaris; atopic dermatitis; disability-adjusted life years; disability weights; disease burden; epidemiology; global health; global burden of disease; prevalence; psoriasis; skin cancer.

Data from the Global Burden of Disease (GBD) 2023 study were released on October 12 2025,[1] and will likely feature in many upcoming dermatoepidemiology manuscripts. Beyond the broad statistics, it is worth appreciating how these numbers were derived to understand some key caveats that may aid in interpretation.

GBD data encompass 23 nonvenereological skin diseases, reporting statistical measures such as prevalence, incidence, and disability-adjusted life years (DALYs). DALYs represent the total burden of disease by combining years of life lost because of premature mortality with years lived with disability (YLD). As most skin diseases are considered nonfatal in the GBD framework, the DALYs are derived by YLD, which multiplies a disability weight at an individual level with the duration of disease and population prevalence. We have summarized the 2023 age-standardized prevalence and DALYs of 9 selected conditions in Table I. Globally, fungal skin diseases continue to show the highest age-standardized prevalence, whereas atopic dermatitis dominates in many high-income countries like the United States, the United Kingdom, China, and France. Atopic dermatitis is also the largest contributor to dermatologic DALYs worldwide, often triple the burden of other major skin diseases. Time trends in the data set are relatively stable for inflammatory skin diseases, apart from acne vulgaris, which shows a steady rise (Table II).

Two notable patterns help illustrate some of the intrinsic limitations of the GBD. First, the unusually low prevalence estimates for some diseases are striking; for example, the unstandardized point prevalence of atopic dermatitis is just 0.39% globally and around 0.6% in the United States and Singapore,[1] compared with survey estimates of 9.2%,[2] 7.3%,[3] and 13.1%, respectively.[4] Second, there was a sharp rise in age-adjusted incidence of nonmelanoma skin cancers from 2005 onward that is biologically highly implausible (Table II).

To understand these inconsistencies, we need to appreciate how GBD estimates are derived. Data are first obtained from primary studies using surveys, insurance claims, and data registries. These are subject to sampling bias, variable coding, and heterogeneity across study methods. These biases are

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Funding sources: None.

IRB approval status: Not applicable.

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JAAD Int 2026;25:78-80.

2666-3287

https://doi.org/10.1016/j.jdin.2025.12.002

Table I. Prevalence and DALYs per 100,000 population in 2023 based on GBD estimates*

Country	Atopic dermatitis	Psoriasis	Urticaria	Acne vulgaris	Fungal skin diseases	Cellulitis	BCC	cSCC	Melanoma
Global	3517.82 (137.17)	369.52 (32.84)	1137.39 (62.38)	721.99 (14.53)	4766.03 (24.65)	10.07 (14.01)	7.40 (16.53)	26.82 (0.03)	27.55 (22.63)
Australia	2185.93 (72.75)	489.67 (47.88)	1056.50 (50.72)	1092.81 (17.73)	1673.65 (6.91)	21.15 (29.58)	102.21 (68.34)	204.28 (0.66)	290.97 (149.62)
China	5598.08 (177.96)	385.74 (39.52)	1242.21 (59.92)	484.95 (7.31)	2457.58 (12.19)	8.17 (0.89)	1.27 (21.40)	2.94 (0.01)	5.31 (11.05)
France	1980.25 (60.54)	509.79 (50.53)	798.30 (36.74)	1195.99 (18.70)	1780.61 (8.12)	11.48 (6.98)	9.01 (24.98)	9.03 (0.07)	160.50 (89.82)
Germany	1306.45 (36.00)	528.38 (54.91)	940.33 (41.89)	1242.17 (16.76)	1876.96 (7.93)	10.35 (10.11)	6.45 (23.30)	7.26 (0.05)	130.73 (103.02)
India	2306.52 (89.35)	318.51 (27.29)	1030.39 (56.86)	284.19 (6.58)	3328.85 (17.45)	9.10 (12.76)	0.14 (8.90)	1.97 (0.00)	1.21 (3.72)
Japan	2351.65 (72.43)	519.89 (56.32)	1141.86 (48.07)	980.17 (12.40)	2939.27 (11.73)	12.78 (15.40)	1.18 (17.19)	2.79 (0.01)	19.62 (15.61)
Malaysia	5722.30 (208.19)	404.91 (35.76)	1192.47 (62.69)	469.38 (9.81)	2613.16 (12.94)	10.66 (35.98)	0.40 (12.73)	3.84 (0.00)	4.27 (8.55)
Singapore	2351.23 (68.95)	505.01 (52.95)	1087.11 (49.06)	993.95 (13.20)	2992.74 (11.74)	14.67 (31.54)	1.73 (7.41)	3.31 (0.01)	17.67 (11.48)
United Kingdom	2849.74 (85.82)	528.77 (51.66)	887.41 (40.98)	1156.71 (17.94)	2002.45 (8.71)	15.57 (48.23)	6.85 (32.37)	9.71 (0.05)	152.31 (112.62)
United States of America	1744.08 (58.17)	517.38 (49.50)	1325.74 (62.79)	1654.38 (27.86)	1664.61 (8.37)	24.34 (28.88)	76.46 (50.38)	316.95 (0.48)	133.74 (76.81)

BCC, Basal cell carcinoma; cSCC, cutaneous squamous cell carcinoma; DALYs, Disability-Adjusted Life Years.
*Prevalence is shown in the top row and DALYs in brackets. Data shown reflects age-adjusted prevalence and DALYs. Both are expressed as per 100,000 population.

especially pronounced in dermatology, where diagnoses often lack objective definitions, many patients with mild to moderate skin disease never receive formal care, and care is largely delivered in the outpatient setting, where coding may be inconsistent. When primary data are sparse, the models borrow from geographically or socio-demographically similar regions or earlier time points. While this allows for global coverage, it also means that artifacts from well-measured regions can propagate to poorly measured ones. Each estimate is accompanied by 95% uncertainty intervals, which should be reported in analytic studies but are often omitted in secondary use.

The sharp increase in non-melanoma skin cancer incidence from 2005 highlights the likely influence of external factors, coinciding with the widespread adoption of electronic medical records,[5] increase in regional compulsory reporting of nonmelanoma skin cancers,[6] and increased use of dermoscopy.[7] The spike may therefore reflect changes in coding and ascertainment rather than biological disease.

Another critical step in understanding GBD data lies in interpreting disability weights. In GBD, disability weights are designed to be uniform across countries, which, while simple mathematically, does not accurately reflect how disability is experienced differently in different populations due to varying societal values, stigmatization, and available treatment. This likely underestimates disease burden in populations with high stigma and low access to treatment. Notably, disability weights for atopic dermatitis and psoriasis are identical, despite real-world evidence showing that patients with atopic dermatitis experience substantially higher symptom burden than those with psoriasis.[8,9] This highlights the lack of granularity and resolution that limits a more accurate representation of skin disease burden.

Despite its limitations, the GBD study remains a comprehensive source of epidemiological data and reflects decades of international collaboration. The GBD team is continuously refining its data inputs and modeling methodologies to improve accuracy with each iteration. This explains why historical estimates (eg, the prevalence of AD in 2010), will have changed between GBD 2021 and 2023. Dermatology researchers should acknowledge and appreciate these limitations when using GBD data. We hope readers will keep these considerations in mind as they use the GBD database, interpret related studies, and consider contributing high-quality primary data to strengthen future GBD iterations.

Table II. Global trends of age-standardized prevalence of selected benign skin conditions and age-standardized incidence of selected skin cancers*

Disease	1990	2000	2010	2020	2023
Atopic dermatitis	3597.71	3526.51 (−2.0%)	3442.26 (−2.4%)	3416.79 (−0.7%)	3394.62 (−0.6%)
Psoriasis	291.43	310.04 (+6.4%)	329.76 (+6.4%)	352.04 (+6.8%)	356.58 (+1.3%)
Urticaria	1100.18	1096.40 (−0.3%)	1095.31 (−0.1%)	1094.76 (−0.0%)	1097.56 (+0.3%)
Acne vulgaris	425.92	492.86 (+15.7%)	574.49 (+16.6%)	668.07 (+16.3%)	696.71 (+4.3%)
Fungal skin diseases	4673.21	4669.43 (−0.1%)	4817.75 (+3.2%)	4608.40 (−4.3%)	4599.23 (−0.2%)
Cellulitis	9.97	9.94 (−0.3%)	9.86 (−0.8%)	9.68 (−1.8%)	9.71 (+0.4%)
Melanoma	3.05	3.79 (+24.3%)	4.27 (+12.5%)	3.59 (−15.9%)	3.62 (+0.9%)
BCC	54.46	31.91 (−41.4%)	54.17 (+69.7%)	57.05 (+5.3%)	55.58 (−2.6%)
cSCC	14.46	9.26 (−35.9%)	23.49 (+153.6%)	25.58 (+8.9%)	23.04 (−9.9%)

BCC, Basal cell carcinoma; cSCC, cutaneous squamous cell carcinoma.
*All values are expressed as Rate per 100,000 (Percentage change from preceding time-point).

Conflicts of interest

None disclosed.

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