Int. j. adv. multidisc. res. stud. 2024; 4(6):1278-1283

Received: 06-11-2024
Accepted: 16-12-2024

International Journal of Advanced Multidisciplinary Research and Studies

ISSN: 2583-049X

Rising Burden and Disparities in the Prevalence of Hidradenitis Suppurativa

[1] Rehman Basharat, [2] Ahmet Burak Buyukbayraktar, [3] Abigail Kazakov
[1, 2, 3] Renaissance School of Medicine, New York, United States

DOI: https://doi.org/10.62225/2583049X.2024.4.6.3599
Corresponding Author: **Rehman Basharat**

Abstract
This study investigates the prevalence trends of hidradenitis suppurativa across sex, race, and age groups in the United States from 2014 to 2023 using data from the TriNetX Research Network. A retrospective, population-based approach was employed to analyze de-identified electronic health records encompassing over a decade of data. Results revealed a significant rise in prevalence, nearly quadrupling from 0.222% in 2014 to 0.842% in 2023, with females consistently exhibiting higher rates than males, widening from a 0.203% gap in 2014 to 0.736% in 2023. Racial disparities were striking, with African Americans experiencing the highest prevalence (2.109% in 2023) compared to Caucasians (0.691%) and Asians (0.334%). Age-specific patterns showed the greatest burden in the 15–29 age group (1.7% in 2023) and substantial increases in adolescents and middle-aged adults, while older populations (≥70 years) exhibited minimal changes. These findings highlight significant disparities across demographic subgroups, underscoring the need for targeted public health interventions, equitable healthcare policies, and further research into underlying drivers.

Keywords: Hidradenitis Suppurativa, Prevalence Trends, Health Disparities, Demographics

Introduction

Hidradenitis suppurativa (HS) is a chronic, recurrent, and debilitating inflammatory skin condition that originates in the hair follicles, predominantly affecting intertriginous areas such as the axillae, groin, and inframammary regions [1]. HS is characterized by painful nodules, abscesses, and sinus tracts that lead to scarring and chronic inflammation, significantly impairing quality of life [2]. Although the exact pathogenesis remains unclear, HS is believed to result from a combination of genetic, environmental, and immunological factors [2, 3]. Key mechanisms include follicular occlusion, rupture of dilated follicles, and sustained inflammation mediated by cytokines such as IL-1, TNF-α, and IL-17 [3]. Exacerbating factors, including smoking, obesity, and metabolic syndrome, contribute to the disease's progression and severity [2, 5].

HS exhibits significant variability in its clinical presentation, ranging from mild inflammatory papules and nodules to severe, deep abscesses with draining sinus tracts and extensive scarring [4]. Women often develop lesions in the inframammary and inguinofemoral regions, while men are more likely to have disease activity in the perianal and buttock areas [6]. Despite its significant physical and psychological impact, HS is frequently underdiagnosed, with an average delay of 7.2 years from symptom onset to diagnosis, highlighting the need for increased awareness among patients and healthcare providers [11].

The heterogeneity of HS is further emphasized by its diverse phenotypic subtypes. Recognized subtypes include the axillary-mammary type, primarily affecting women; the follicular type, associated with severe acne and more common in men; and the gluteal type, characterized by buttock involvement [7]. Other subtypes, such as the frictional furuncle and scarring folliculitis types, complicate diagnosis and management, underscoring the need for individualized treatment strategies [8, 9]. While the condition is diagnosed clinically, additional tools such as biopsy and ultrasound imaging can aid in confirming the diagnosis and detecting subclinical sinus tracts [10]. However, delays in diagnosis and inconsistent recognition of the disease contribute to a substantial burden for patients and healthcare systems.

Although epidemiological studies have provided prevalence estimates for HS in various countries, wide variations exist due to differences in methodologies, diagnostic criteria, and population demographics. Moreover, most studies focus on European populations, with limited data available from underrepresented regions, including the United States. This lack of comprehensive data impedes efforts to identify trends, disparities, and populations at higher risk. Understanding these patterns

is critical for developing targeted interventions and improving health outcomes for affected populations. This study addresses these gaps by investigating decade-long prevalence trends of HS in the United States (2014–2023) using data from the TriNetX Research Network. By analyzing prevalence across sex, race, and age groups, this research aims to uncover key disparities and emerging patterns. The findings have the potential to inform public health initiatives, enhance early diagnosis, and guide equitable treatment strategies. The growing recognition of HS as a significant public health concern underscores the importance of this research in shaping effective policies and improving the lives of individuals affected by this debilitating condition.

Methods

Study Design and Data Sources

This retrospective, population-based study analyzed temporal, demographic, and age-based trends in the prevalence of hidradenitis suppurativa from January 1, 2014, to December 31, 2023. Data were obtained from the TriNetX Research Network, a real-world data platform that aggregates de-identified electronic health records (EHRs), insurance claims, and clinical information from participating healthcare organizations across the United States. TriNetX provides large-scale patient-level data, enabling reliable analyses of epidemiological trends representative of the U.S. population.

Study Population

The study population included individuals aged 0–84 years from all healthcare organizations contributing data to TriNetX across the United States. Cases were stratified into the following subgroups for analysis:

- **Sex:** Male and Female
- **Race:** Caucasian, African American, and Asian
- **Age Groups:** 0–4, 5–9, 10–14, 15–19, 20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, 55–59, 60–64, 65–69, 70–74, 75–79, and 80–84 years

Annual prevalence estimates were derived from TriNetX's patient counts and census-based population estimates provided within the platform.

Prevalence Rate Calculations

Prevalence was defined as the proportion of individuals diagnosed with the condition out of the total population within a given year. Annual prevalence rates were calculated as follows:

Prevalence Rate (%) = (Number of Cases in Year) / (Population Size in Year) × 100

Patient counts and subgroup stratifications were retrieved using TriNetX's analytics tools, which also provided automated calculations for prevalence rates.

Quality Control

TriNetX's built-in data validation procedures ensured the completeness, accuracy, and de-identification of patient data. Population estimates and denominators were cross-referenced with available U.S. census data to verify reliability. Cases with incomplete demographic or clinical information were excluded, and data inconsistencies were addressed through automated checks.

Results

Overall Trends in Prevalence

The overall prevalence of hidradenitis suppurativa demonstrated a consistent and significant increase over the 10-year study period. In 2014, the prevalence was recorded at 0.222%, marking the starting point for the observed trend. This increased modestly to 0.264% in 2015 and further to 0.319% in 2016, reflecting a gradual but steady rise in prevalence over the first three years. By 2017, prevalence had reached 0.371%, showing a continued upward trajectory. A more notable increase occurred in 2018, where prevalence rose to 0.431%, followed by 0.497% in 2019, approaching the halfway point of 1%. From 2020 onward, the rise in prevalence became more pronounced, reaching 0.561% in 2020 and climbing to 0.641% in 2021. By 2022, prevalence approached three-quarters of a percent at 0.736%, before peaking at 0.842% in 2023. This represents nearly a four-fold increase from the baseline year (2014) to the final year of the study (2023), highlighting a steady and accelerating trend in overall prevalence (Fig 1).

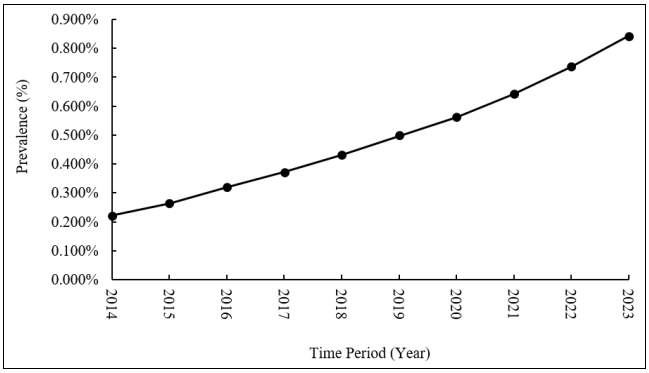


Fig 1: Trends in Overall Prevalence Over Time (2014–2023)

Gender-Specific Trends in Prevalence

The gender-specific trends revealed clear and consistent disparities between males and females throughout the study period. In 2014, prevalence among males was 0.107%, while females demonstrated a significantly higher rate at 0.310%, nearly three times greater. This pattern persisted over the subsequent years, with both genders experiencing increasing prevalence, but females consistently outpacing males. By 2015, male prevalence rose to 0.132%, while female prevalence increased to 0.369%. In 2016, males reached 0.155%, and females climbed to 0.449%. The gender gap continued to widen as prevalence rates increased. In 2017, males had a prevalence of 0.191%, while females experienced a sharper rise to 0.513%. Similarly, in 2018, prevalence among males reached 0.220%, compared to 0.596% for females. By 2019, male prevalence stood at 0.253%, while female prevalence increased to 0.689%, reflecting a nearly 0.4% difference. This pattern persisted in the following years, with male prevalence rising to 0.282% in 2020, 0.317% in 2021, and 0.365% in 2022. In contrast, female prevalence showed steeper increases, reaching 0.776% in 2020, 0.889% in 2021, and surpassing 1% in 2022 at 1.017%. By 2023, prevalence among males peaked at 0.423%, while females reached 1.159%, marking the largest observed difference between the two groups over the 10-year period. These findings underscore the disproportionate burden of the condition among females,

with the gender gap expanding consistently over time (Fig 2).

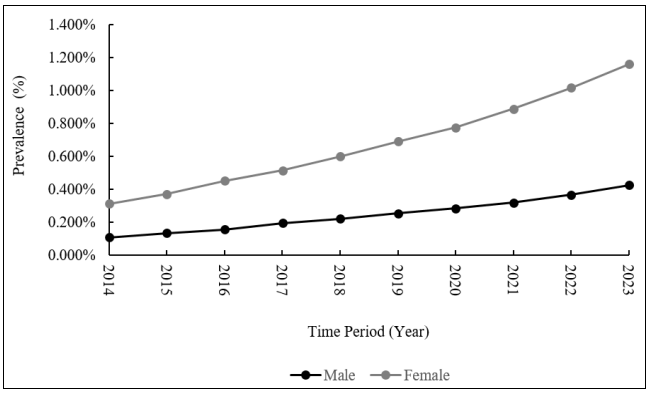


Fig 2: Gender-Specific Trends in Prevalence Over Time (2014–2023)

Racial Trends in Prevalence

Prevalence trends across racial groups revealed significant disparities. In 2014, African Americans exhibited the highest prevalence at 0.672%, more than four times the rate observed in Asians (0.066%) and significantly higher than Caucasians (0.164%). The racial disparities persisted and widened over the subsequent years. By 2015, prevalence increased to 0.815% among African Americans, compared to 0.192% for Caucasians and 0.077% for Asians. In 2016, African American prevalence climbed to 0.945%, while Caucasians and Asians increased to 0.236% and 0.087%, respectively. By 2017, African American prevalence surpassed 1% for the first time, reaching 1.070%, while Caucasians and Asians reached 0.279% and 0.114%, respectively. The upward trend continued in 2018, with prevalence among African Americans rising to 1.192%, Caucasians to 0.331%, and Asians to 0.152%. By 2019, African American prevalence reached 1.349%, nearly double the rate among Caucasians (0.386%) and far exceeding Asians (0.176%). This trend accelerated further from 2020 onward. In 2020, African American prevalence rose to 1.503%, Caucasian prevalence reached 0.438%, and Asian prevalence stood at 0.199%. By 2021, the prevalence among African Americans climbed to 1.661%, while Caucasians and Asians increased to 0.507% and 0.244%, respectively. In 2022, African American prevalence approached 1.865%, while Caucasian prevalence increased to 0.594%, and Asian prevalence reached 0.287%. By 2023, African Americans exhibited a striking prevalence of 2.109%, compared to 0.691% among Caucasians and 0.334% among Asians. These findings highlight the disproportionately higher burden of the condition among African Americans, with a growing gap relative to Caucasians and Asians over time (Fig 3).

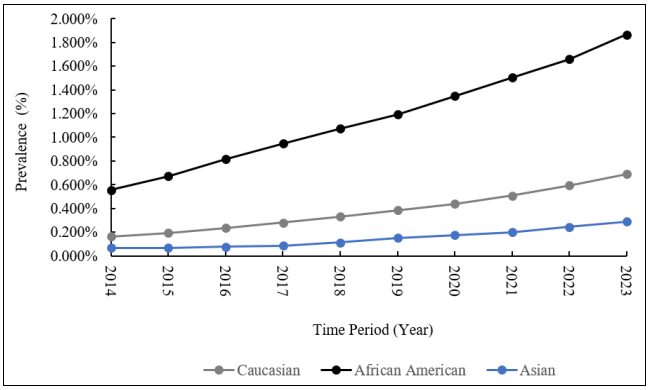
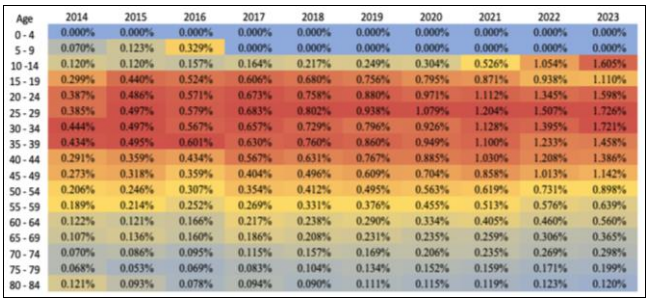


Fig 3: Trends in Prevalence by Race Over Time (2014–2023)

Prevalence Across Age Groups for Each Year

Fig 4 provides a snapshot of prevalence trends across all age groups within each individual year, allowing for comparison between age groups over time. In 2014, prevalence was highest among individuals aged 25–29 years at 0.435%, while most other age groups exhibited relatively low values, with prevalence in children aged 0–4 years at 0.000% and the elderly (≥75 years) ranging between 0.068% and 0.121%. By 2015, prevalence increased notably in the 5–9 age group, rising to 0.329%, while prevalence in the 10–14 age group reached 0.157%, marking early increases in younger populations. This pattern persisted into 2016, where the 15–19 age group began to show a sharp increase to 0.524%, alongside a consistent rise in the 20–29 age group (up to 0.6%). In 2017 and 2018, age groups 15–29 years demonstrated significant increases, with the 25–29 age group reaching 0.782% by 2018. Prevalence also grew steadily in the 30–44 age groups, exceeding 0.5% by 2018. Meanwhile, prevalence among the 0–4 years and ≥75 years groups remained comparatively low, with values below 0.1%. By 2019, the prevalence exceeded 0.8% in the 15–29 age group, marking a critical threshold. Children aged 10–14 years also experienced an increase, reaching 0.307%, suggesting an emerging trend in younger age groups. Prevalence continued to rise across all age groups into 2020, with the 20–29 age group surpassing 1.0%, while the 30–44 age group reached approximately 0.7%. In the later years of the study, from 2021 to 2023, the 15–29 age group demonstrated the sharpest increases. By 2023, prevalence in the 25–29 age group had reached 1.72%, while the 20–24 age group followed closely at 1.6%. Additionally, the 10–14 age group saw a notable increase to 1.1%, reflecting a significant upward trend in adolescents. By contrast, prevalence in older adults aged 75–84 years remained low, peaking at just 0.2% in 2023. Overall, Fig 4 reveals that prevalence is consistently higher in the 15–29 and 30–44 age groups, with significant increases observed over time, particularly from 2019 onward. Younger children and older

adults remained relatively unaffected, showing minimal increases across the 10-year period.

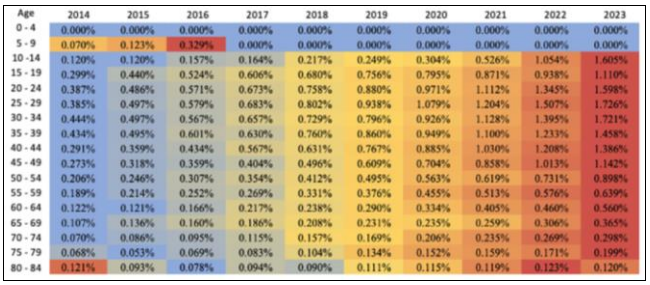


Age	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
0 - 4	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
5 - 9	0.070%	0.123%	0.329%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
10 - 14	0.120%	0.120%	0.157%	0.164%	0.217%	0.249%	0.304%	0.526%	1.054%	1.605%
15 - 19	0.299%	0.440%	0.524%	0.606%	0.680%	0.756%	0.795%	0.871%	0.938%	1.110%
20 - 24	0.387%	0.486%	0.571%	0.673%	0.758%	0.880%	0.971%	1.112%	1.345%	1.598%
25 - 29	0.385%	0.497%	0.579%	0.683%	0.802%	0.938%	1.079%	1.204%	1.507%	1.726%
30 - 34	0.444%	0.497%	0.567%	0.657%	0.729%	0.796%	0.926%	1.128%	1.395%	1.721%
35 - 39	0.434%	0.495%	0.601%	0.630%	0.760%	0.860%	0.949%	1.100%	1.233%	1.458%
40 - 44	0.291%	0.359%	0.434%	0.567%	0.631%	0.767%	0.885%	1.030%	1.208%	1.386%
45 - 49	0.273%	0.318%	0.359%	0.404%	0.496%	0.609%	0.704%	0.858%	1.013%	1.142%
50 - 54	0.206%	0.246%	0.307%	0.354%	0.412%	0.495%	0.563%	0.619%	0.731%	0.898%
55 - 59	0.189%	0.214%	0.252%	0.269%	0.331%	0.376%	0.455%	0.513%	0.576%	0.639%
60 - 64	0.122%	0.121%	0.166%	0.217%	0.238%	0.290%	0.334%	0.405%	0.460%	0.560%
65 - 69	0.107%	0.136%	0.160%	0.186%	0.208%	0.231%	0.235%	0.259%	0.306%	0.365%
70 - 74	0.070%	0.086%	0.095%	0.115%	0.157%	0.169%	0.206%	0.235%	0.269%	0.298%
75 - 79	0.068%	0.053%	0.069%	0.083%	0.104%	0.134%	0.152%	0.159%	0.171%	0.199%
80 - 84	0.121%	0.093%	0.078%	0.094%	0.090%	0.111%	0.115%	0.119%	0.123%	0.120%

Fig 4: Heatmap of Prevalence (%) Across Age Groups for Each Year (2014–2023)

Prevalence Trends Over Time for Each Age Group

Fig 5 offers a longitudinal view of prevalence within each age group over time, providing a comprehensive understanding of how prevalence evolved during the 10-year study period. The prevalence in the 5–14 age group demonstrated substantial growth, starting from 0.1% in 2014 and increasing modestly to 0.2% in 2016. This group exhibited more pronounced increases after 2017, reaching 0.4% in 2019 and exceeding 1.0% by 2023. This trend highlights a rising burden of the condition in school-aged children, with prevalence more than doubling in the latter half of the study period. The 15–19 age group showed an even sharper increase, with prevalence rising from 0.4% in 2014 to 0.6% in 2016. By 2018, prevalence reached 0.9%, and further increased to 1.3% in 2021 before peaking at 1.6% in 2023. This dramatic rise reflects a heightened impact of the condition in adolescents, where the rate of increase was notably higher compared to younger age groups. Among the 20–29 age group, prevalence exhibited the most consistent and pronounced rise across the decade. Starting at 0.4–0.5% in 2014, prevalence climbed steadily to 0.7% in 2016, crossed the 1.0% threshold in 2019, and eventually surpassed 1.7% by 2023. This group experienced the highest prevalence rates overall, with a nearly four-fold increase over the study period, confirming that young adults are disproportionately affected by the condition. The 30–44 age group also exhibited significant increases, though at a slightly slower pace compared to younger populations. Prevalence rose from 0.3–0.4% in 2014 to 0.6% in 2018 and further climbed to 1.0% in 2020, exceeding 1.5% by 2023. These trends indicate that the burden of the condition extends beyond adolescents into middle-aged populations, highlighting a broadening age range of affected individuals. In contrast, older age groups, particularly those aged 70–84 years, experienced much smaller increases over time. For example, the prevalence in the 75–79 age group grew only marginally, from 0.068% in 2014 to 0.1% in 2018, before peaking at 0.2% by 2023. Similarly, the 70–74 age group exhibited minimal changes, with prevalence remaining below 0.2% throughout the study period. These findings suggest that while older populations are impacted, the burden is substantially lower compared to younger and middle-aged groups. Overall, the trends shown in Fig 5 emphasize the steady and disproportionate increase in prevalence among younger populations (5–29 years), particularly in adolescents and young adults, who demonstrated the highest growth rates. Middle-aged populations (30–44 years) also experienced notable increases, though at a slightly slower pace. Meanwhile, older populations (≥70 years) exhibited slower and less pronounced growth, indicating a comparatively lower burden over the study period.



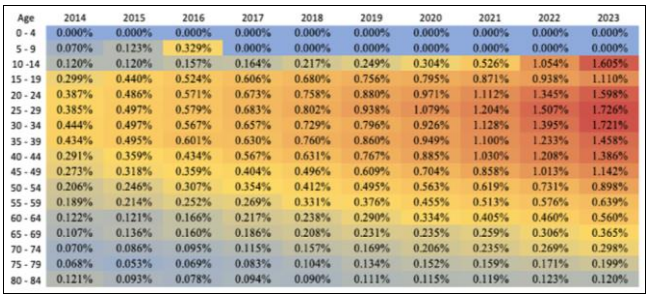
Age	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
0 - 4	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
5 - 9	0.070%	0.123%	0.329%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
10 - 14	0.120%	0.120%	0.157%	0.164%	0.217%	0.249%	0.304%	0.526%	1.054%	1.605%
15 - 19	0.299%	0.440%	0.524%	0.606%	0.680%	0.756%	0.795%	0.871%	0.938%	1.110%
20 - 24	0.387%	0.486%	0.571%	0.673%	0.758%	0.880%	0.971%	1.112%	1.345%	1.598%
25 - 29	0.385%	0.497%	0.579%	0.683%	0.802%	0.938%	1.079%	1.204%	1.507%	1.726%
30 - 34	0.444%	0.497%	0.567%	0.657%	0.729%	0.796%	0.926%	1.128%	1.395%	1.721%
35 - 39	0.434%	0.495%	0.601%	0.630%	0.760%	0.860%	0.949%	1.100%	1.233%	1.458%
40 - 44	0.291%	0.359%	0.434%	0.567%	0.631%	0.767%	0.885%	1.030%	1.208%	1.386%
45 - 49	0.273%	0.318%	0.359%	0.404%	0.496%	0.609%	0.704%	0.858%	1.013%	1.142%
50 - 54	0.206%	0.246%	0.307%	0.354%	0.412%	0.495%	0.563%	0.619%	0.731%	0.898%
55 - 59	0.189%	0.214%	0.252%	0.269%	0.331%	0.376%	0.455%	0.513%	0.576%	0.639%
60 - 64	0.122%	0.121%	0.166%	0.217%	0.238%	0.290%	0.334%	0.405%	0.460%	0.560%
65 - 69	0.107%	0.136%	0.160%	0.186%	0.208%	0.231%	0.235%	0.259%	0.306%	0.365%
70 - 74	0.070%	0.086%	0.095%	0.115%	0.157%	0.169%	0.206%	0.235%	0.269%	0.298%
75 - 79	0.068%	0.053%	0.069%	0.083%	0.104%	0.134%	0.152%	0.159%	0.171%	0.199%
80 - 84	0.121%	0.093%	0.078%	0.094%	0.090%	0.111%	0.115%	0.119%	0.123%	0.120%

Fig 5: Heatmap of Prevalence (%) Over Time for Each Age Group (2014–2023)

Overall Prevalence Patterns Across Age Groups and Years

Fig 6 provides a comprehensive overview of prevalence trends across all age groups and years, enabling a combined analysis of how prevalence varied both temporally and across demographics. The use of a heatmap format allows for easy visualization of shifts in the burden of the condition over the 10-year study period. In 2014, prevalence was primarily concentrated in the 25–29 age group, with values peaking at 0.435%, as indicated by the warmer orange tones in this population. Cooler tones (blue and light yellow) dominated most other age groups, reflecting relatively low prevalence, particularly among younger children (0–4 years) and older adults (≥70 years), where prevalence remained below 0.1%. As the years progressed, the heatmap reveals an expansion of warmer tones, particularly in the 15–29 and 30–44 age groups, signifying a growing burden of the condition in these populations. By 2016, the 20–29 age group exhibited prevalence values approaching 0.6%, while the 15–19 age group began to show a noticeable increase, reaching 0.4%. A similar upward trend emerged in the 30–44 age group, where prevalence surpassed 0.3% in 2016. In contrast, cooler colors persisted in the youngest (0–4 years) and oldest (≥70 years) age groups, indicating minimal changes during the early years of the study period. By 2019, the heatmap showed a marked intensification of warmer tones in the 15–44 age groups, particularly among the 20–29 age group, where prevalence exceeded 1.0%. The 15–19 age group also exhibited significant growth, surpassing 0.8%. During this period, the 30–44 age group continued its upward trend, with prevalence reaching 0.7%, demonstrating that middle-aged populations were increasingly affected. Meanwhile, the prevalence among older adults (≥70 years) remained minimal, with values consistently below 0.2%, as reflected by the persistent cooler tones. From 2020 to 2023, the heatmap highlights a dramatic acceleration of prevalence in younger populations. By 2023, the 15–19 age group had prevalence values exceeding 1.6%, while the 20–29 age group reached 1.7%, making it the most affected population. The 30–44 age group also experienced substantial increases, with prevalence surpassing 1.5%. These shifts are indicated by the dominance of red and dark orange tones in the heatmap for these groups during the later years of the study period. In contrast, cooler colors remained prevalent in the 0–4 years group, where prevalence stayed below 0.1% across all years. Similarly, the ≥70 years group exhibited minimal changes,

with prevalence values peaking at approximately 0.2% in 2023. The overall patterns shown in Fig 6 confirm that the burden of the condition is heavily concentrated in adolescents (5–14 years), young adults (15–29 years), and middle-aged populations (30–44 years), particularly during the second half of the study period (2019–2023). These groups experienced the most pronounced increases in prevalence, as reflected by the progressively warmer colors over time. In contrast, prevalence among younger children (0–4 years) and older adults (≥70 years) remained consistently low, with values staying below 0.3% throughout the decade.



Age	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
0 - 4	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
5 - 9	0.070%	0.123%	0.329%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
10 -14	0.120%	0.120%	0.157%	0.164%	0.217%	0.249%	0.304%	0.526%	1.054%	1.605%
15 - 19	0.299%	0.440%	0.524%	0.606%	0.680%	0.756%	0.795%	0.871%	0.938%	1.110%
20 - 24	0.387%	0.486%	0.571%	0.673%	0.758%	0.880%	0.971%	1.112%	1.345%	1.598%
25 - 29	0.385%	0.497%	0.579%	0.683%	0.802%	0.938%	1.079%	1.204%	1.507%	1.726%
30 - 34	0.444%	0.497%	0.567%	0.657%	0.729%	0.796%	0.926%	1.128%	1.395%	1.721%
35 - 39	0.434%	0.495%	0.601%	0.630%	0.760%	0.860%	0.949%	1.100%	1.233%	1.458%
40 - 44	0.291%	0.359%	0.434%	0.567%	0.631%	0.767%	0.885%	1.030%	1.208%	1.386%
45 - 49	0.273%	0.318%	0.359%	0.404%	0.496%	0.609%	0.704%	0.858%	1.013%	1.142%
50 - 54	0.206%	0.246%	0.307%	0.354%	0.412%	0.495%	0.563%	0.619%	0.731%	0.898%
55 - 59	0.189%	0.214%	0.252%	0.269%	0.331%	0.376%	0.455%	0.513%	0.576%	0.639%
60 - 64	0.122%	0.121%	0.166%	0.217%	0.238%	0.290%	0.334%	0.405%	0.460%	0.560%
65 - 69	0.107%	0.136%	0.160%	0.186%	0.208%	0.231%	0.235%	0.259%	0.306%	0.365%
70 - 74	0.070%	0.086%	0.095%	0.115%	0.157%	0.169%	0.206%	0.235%	0.269%	0.298%
75 - 79	0.068%	0.053%	0.069%	0.083%	0.104%	0.134%	0.152%	0.159%	0.171%	0.199%
80 - 84	0.121%	0.093%	0.078%	0.094%	0.090%	0.111%	0.115%	0.119%	0.123%	0.120%

Fig 6: Heatmap of Overall Prevalence (%) Across All Age Groups and Years (2014–2023)

Discussion

Sex-Based Disparities:

The consistently higher prevalence among females compared to males across the study period reflects notable sex-based disparities. Female prevalence was nearly three times higher than male prevalence in 2014 (0.310% vs. 0.107%) and widened further by 2023 (1.159% vs. 0.423%). This persistent and growing gap suggests sex-specific factors influencing disease susceptibility and healthcare engagement. Biological factors, including hormonal influences and immunological differences, may play a significant role in the higher prevalence observed among females. For example, conditions influenced by inflammatory or autoimmune pathways are often reported to have a higher prevalence in females due to hormonal fluctuations and differences in immune system activity. Further studies should explore how such mechanisms might contribute to the observed trends in this condition. Behavioral and societal factors may also explain part of this disparity. Females are often more likely to seek healthcare for chronic conditions, leading to higher rates of diagnosis and treatment. Additionally, healthcare providers may be more attuned to diagnosing certain conditions in females compared to males, potentially leading to underdiagnosis in males. This disparity raises concerns about potential diagnostic and treatment gaps for males, which could result in delayed intervention and worse long-term outcomes. Addressing these gaps requires a nuanced approach, including increasing awareness among providers and the general population to ensure equitable diagnostic practices. The widening gap between males and females over time indicates that emerging or worsening risk factors may disproportionately affect females. These could include psychosocial stressors, occupational exposures, or lifestyle-related factors such as diet and physical activity, which may have differential effects based on sex. Research into these emerging factors is critical to understanding and mitigating this growing disparity. Furthermore, public health strategies should prioritize early identification and management of the condition in males to close the gap and ensure equitable healthcare access.

Racial Disparities:

Racial disparities in prevalence were striking, with African Americans consistently exhibiting the highest prevalence rates. In 2014, African American prevalence was more than four times that of Asians (0.672% vs. 0.066%) and significantly higher than that of Caucasians (0.164%). By 2023, these disparities had widened further, with prevalence among African Americans reaching 2.109%, compared to 0.691% for Caucasians and 0.334% for Asians. This disproportionate burden highlights long-standing inequities in healthcare access, environmental exposures, and social determinants of health. Potential biological factors, including genetic predispositions, may also contribute to the higher prevalence observed in African Americans. Differences in inflammatory responses, immune system regulation, or genetic susceptibility to the condition could explain part of this trend. However, these biological factors are unlikely to fully account for the disparities, emphasizing the critical role of social and systemic influences. African Americans often face structural barriers to accessing timely and adequate healthcare, including socioeconomic disadvantages, lower healthcare coverage rates, and geographic disparities in the availability of providers. These barriers may delay diagnosis and treatment, leading to higher prevalence rates over time. Moreover, implicit biases in the healthcare system may contribute to disparities in the recognition and management of the condition. These findings underscore the urgent need for policies aimed at reducing racial disparities in healthcare through improved access, education, and culturally competent care. In contrast, the lower prevalence observed among Asians may reflect cultural, genetic, or healthcare-seeking differences. However, the steady increase in prevalence among Asians over the study period suggests that this population is not immune to the condition's rising burden. Future studies should investigate potential underdiagnosis in racial minority groups and assess whether cultural factors influence healthcare engagement.

Age-Based Patterns:

Age-specific trends demonstrated that the condition disproportionately affects younger and middle-aged populations. The 15–29 age group exhibited the highest prevalence throughout the study period, reaching 1.7% by 2023, with a steady increase beginning as early as 2014 (0.4–0.5%). Similarly, the 30–44 age group experienced substantial growth, with prevalence exceeding 1.5% by 2023, suggesting a broadening age range of affected individuals. These findings are concerning, given the critical life stages these age groups represent, encompassing educational, professional, and family-building milestones. The condition's impact during these years could lead to significant personal and societal burdens, including reduced productivity, economic costs, and diminished quality of life. The upward trend in the 5–14 age group, where prevalence surpassed 1.0% by 2023, highlights an emerging burden among younger populations. These findings emphasize the importance of early detection and management strategies tailored to adolescents, as early intervention could mitigate disease progression and associated complications. The sharp

rise in prevalence among younger populations could reflect increased awareness, earlier diagnostic capabilities, or potential environmental or behavioral risk factors disproportionately affecting these age groups. Conversely, prevalence remained consistently low among older adults (≥70 years), with values peaking at 0.2% in 2023. This finding may reflect differences in disease susceptibility, reduced exposure to risk factors, or underdiagnosis in this population. Older adults may also prioritize other comorbidities during healthcare visits, leading to a lower likelihood of diagnosis. Understanding whether older populations are genuinely less affected or underdiagnosed is critical to refining healthcare strategies for this age group. The findings reveal the condition's disproportionate burden on younger and middle-aged populations, calling for age-specific public health interventions. Educational campaigns, early screening programs, and increased access to care for younger populations could help reduce long-term impacts and improve quality of life.

Conclusion

This study provides critical insights into the prevalence trends of the condition across sex, race, and age groups from 2014 to 2023. The findings highlight widening disparities, with females and African Americans disproportionately affected and younger populations experiencing the sharpest increases in prevalence. These disparities underscore the importance of equitable healthcare policies, culturally competent care, and tailored intervention strategies to address the growing burden of the condition. Future research should prioritize understanding the underlying drivers of these trends and developing targeted preventive and therapeutic measures to reduce disparities and improve outcomes. By addressing these challenges, public health efforts can ensure more equitable care and mitigate the societal impacts of the condition.

References

1. Canoui-Poitrine F, Le Thuaut A, Revuz JE, Viallette C, Gabison G, Poli F, *et al*. Identification of three hidradenitis suppurativa phenotypes: Latent class analysis of a cross-sectional study. J Invest Dermatol. 2013; 133(6):1506-1511. Doi: 10.1038/jid.2012.472. Epub 2012 Dec 13. PMID: 23235532.
2. Van der Zee HH, Jemec GB. New insights into the diagnosis of hidradenitis suppurativa: Clinical presentations and phenotypes. J Am Acad Dermatol. 2015; 73(5 Suppl 1):S23-6. Doi: 10.1016/j.jaad.2015.07.047. PMID: 26470610.
3. Cosmatos I, Matcho A, Weinstein R, Montgomery MO, Stang P. Analysis of patient claims data to determine the prevalence of hidradenitis suppurativa in the United States. J Am Acad Dermatol. 2013; 68(3):412-419. Doi: 10.1016/j.jaad.2012.07.027. Epub 2012 Aug 24. PMID: 22921795.
4. Jemec GB, Heidenheim M, Nielsen NH. The prevalence of hidradenitis suppurativa and its potential precursor lesions. J Am Acad Dermatol. 1996; 35(2 Pt 1):191-194. Doi: 10.1016/s0190-9622(96)90321-7. PMID: 8708018.
5. Revuz JE, Canoui-Poitrine F, Wolkenstein P, Viallette C, Gabison G, Pouget F, *et al*. Prevalence and factors associated with hidradenitis suppurativa: Results from two case-control studies. J Am Acad Dermatol. 2008; 59(4):596-601. Doi: 10.1016/j.jaad.2008.06.020. PMID: 18674845.
6. Garg A, Wertenteil S, Baltz R, Strunk A, Finelt N. Prevalence Estimates for Hidradenitis Suppurativa among Children and Adolescents in the United States: A Gender- and Age-Adjusted Population Analysis. J Invest Dermatol. 2018; 138(10):2152-2156. Doi: 10.1016/j.jid.2018.04.001. Epub 2018 Apr 13. PMID: 29660301.
7. Goldburg SR, Strober BE, Payette MJ. Hidradenitis suppurativa: Epidemiology, clinical presentation, and pathogenesis. J Am Acad Dermatol. 2020; 82(5):1045-1058. Doi: 10.1016/j.jaad.2019.08.090. Epub 2019 Oct 9. PMID: 31604104.
8. Hagan PG, Kjærsgaard Andersen R, Seldam IT, van Gelder F, Zwijnenburg C, Boer J, Ernst Jemec GB. Hidradenitis suppurativa prevalence in Berekum, Ghana: A cross-sectional study and initial validation of a questionnaire in an African setting. JAAD Int. 2020; 1(1):1-2. Doi: 10.1016/j.jdin.2020.02.001. PMID: 34409310; PMCID: PMC8361892.
9. Garg A, Lavian J, Lin G, Strunk A, Alloo A. Incidence of hidradenitis suppurativa in the United States: A sex- and age-adjusted population analysis. J Am Acad Dermatol. 2017; 77(1):118-122. Doi: 10.1016/j.jaad.2017.02.005. Epub 2017 Mar 9. PMID: 28285782.
10. Vazquez BG, Alikhan A, Weaver AL, Wetter DA, Davis MD. Incidence of hidradenitis suppurativa and associated factors: A population-based study of Olmsted County, Minnesota. J Invest Dermatol. 2013; 133(1):97-103. Doi: 10.1038/jid.2012.255. Epub 2012 Aug 30. PMID: 22931916; PMCID: PMC3541436.
11. Canoui-Poitrine F, Revuz JE, Wolkenstein P, Viallette C, Gabison G, Pouget F, *et al*. Clinical characteristics of a series of 302 French patients with hidradenitis suppurativa, with an analysis of factors associated with disease severity. J Am Acad Dermatol. 2009; 61(1):51-57. Doi: 10.1016/j.jaad.2009.02.013. Epub 2009 Apr 29. PMID: 19406505.