EPH57

Epidemiology of Alopecia Areata Across Global Regions – A Systematic Literature Review

Vu B-K[1], Tuson H[2], Harricharan S[1], Law EH[3], Wosik K[4], Tran H[3], Wolk R[5], Neary MP[6]

[1]Cytel, Inc., Waltham, Massachusetts, United States; [2]Pfizer Ltd., Walton Oaks, Tadworth, Surrey, United Kingdom; [3]Pfizer Inc., New York, New York, United States; [4]Pfizer Canada, Montreal, Quebec, Canada; [5]Pfizer Inc., Groton, Connecticut, United States; [6]Pfizer Inc, Collegeville, PA, United States

INTRODUCTION

Background

- Alopecia areata (AA) is an autoimmune disease that has an underlying immuno-inflammatory pathogenesis and is characterized by nonscarring hair loss ranging from small patches to complete scalp, face, and/or body hair loss. (Islam et al. 2015)
- Complete loss of terminal hairs from the entire scalp (alopecia totalis [AT]) or the scalp and body (alopecia universalis [AU]) can sometimes develop, as may a band-like pattern of hair loss at the occipital scalp margin (ophiasis [AO]).
- AA is clinically heterogenous, and its natural history is unpredictable. There is no preventative therapy or cure.
- AA, which is a complex disease influenced by genetic and environmental variables, has a high degree of phenotypic and genotypic diversity. Variability is observed in prevalence, age of onset, history, and concurrent diseases. (Pratt et al. 2017)
- Few studies have examined the epidemiology of AT, AU or AO, and there may be regional differences of AA epidemiology.
- A comprehensive understanding of the global epidemiology of AA is needed for future disease management.

OBJECTIVE

- **A systematic literature review (SLR) was conducted to identify epidemiological rates and frequency of AA and associated comorbidities across US, Europe, and Asia.**

METHODS

- An SLR was performed in accordance with the Preferred Reporting Item for Systematic Reviews and Meta-Analyses (PRISMA) guidelines using Population, Intervention & Comparators, Outcomes and Study Design (PICOS) criteria
- Studies reporting epidemiological outcomes in AA from January 2010-October 2021 were identified in searches of EMBASE, MEDLINE, and Cochrane. Publications from relevant dermatological congresses (2019-2021) and clinicaltrials.gov were also manually searched. Study design, population characteristics, and outcomes were summarized descriptively.
- Additional searches of the following congresses were also conducted from 2019-2021:
  - American Academy of Dermatology (AAD)
  - Academy of Managed Care Pharmacy (AMCP)
  - European Association of Dermatology and Venereology (EADV)
  - The International Society for Pharmacoeconomics and Outcomes Research (ISPOR)
  - Society of Investigative Dermatology (SID)
  - British Association Dermatology (BAD)
  - The International League of Dermatological Societies: World Congress of Dermatology (WCD)

Strengths

- A systematic approach was adopted for this literature review, in alignment with PRISMA reporting guidelines, to ensure a synthesis of all available evidence on the incidence and prevalence of AA.
- Protocol was internally validated and agreed upon a priori, with two independent reviewers determining inclusion and ensuring accurate extraction of studies.

Limitations

- Populations used were highly heterogeneous, varying from general population to patients included from claims databases or medical charts from hospitals/clinics.
- Variations in data results may be due to differences in study designs (surveys, prospective studies, retrospective studies) which employ a variety of study methods, outcomes measures, and inclusion/exclusion criteria.
- In some studies AA was self-reported, while in others it was reported based on clinician diagnosis.
- The SLR was limited to English-language publications of trials or studies which lead to language bias.

CONCLUSIONS

- Incidence and prevalence rates for AA reported in published literature are highly variable, which may be due in part to differences in population distribution by gender, age, region and/or due to different time periods for data collection.
- Prevalence in the pediatric population appears to be lower than in the general population, however more studies are required to confirm this trend.
- Prevalence/incidence appears similar between males and females; however, comparative data are limited.
- AA may coexist with other autoimmune conditions, such as psoriasis, inflammatory bowel disease, and vitiligo.
- Future research is needed to obtain more precise estimates for these incidence and prevalence rates across key strata such as countries, regions, gender groups, racial groups and age-groups.

RESULTS

- A total of 97 records from 96 original studies were selected for data extraction in the epidemiology SLR (**Figure 1**).
- Overall prevalence and incidence rates were reported in 55 studies, of which 21 reported point prevalence, 19 reported period prevalence, 16 reported incidence, and 3 reported lifetime prevalence.
  - Prevalence ranges included: point (0.04 to 6.7%), period (0 to 5 years) (0.42 to 4.95%), and lifetime (2.5-13.8%).
  - Prevalence rates varied across studies, increasing over time, across regions, and among children and adolescents.
- The breakdowns of the included studies by country and by study design are presented in **Figure 2** and **Figure 3**.

Figure 1. PRISMA Flow Diagram for SLR findings

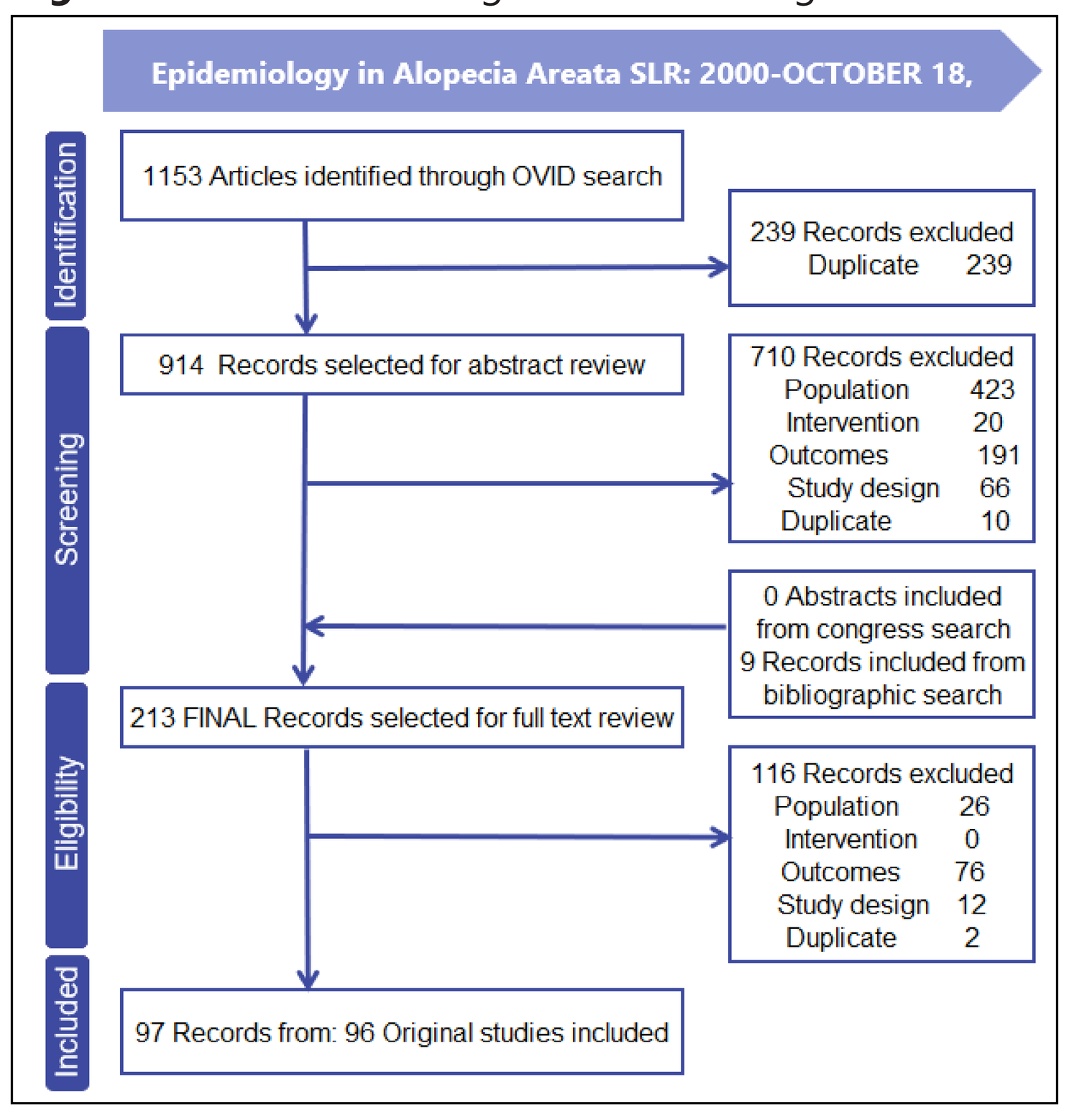
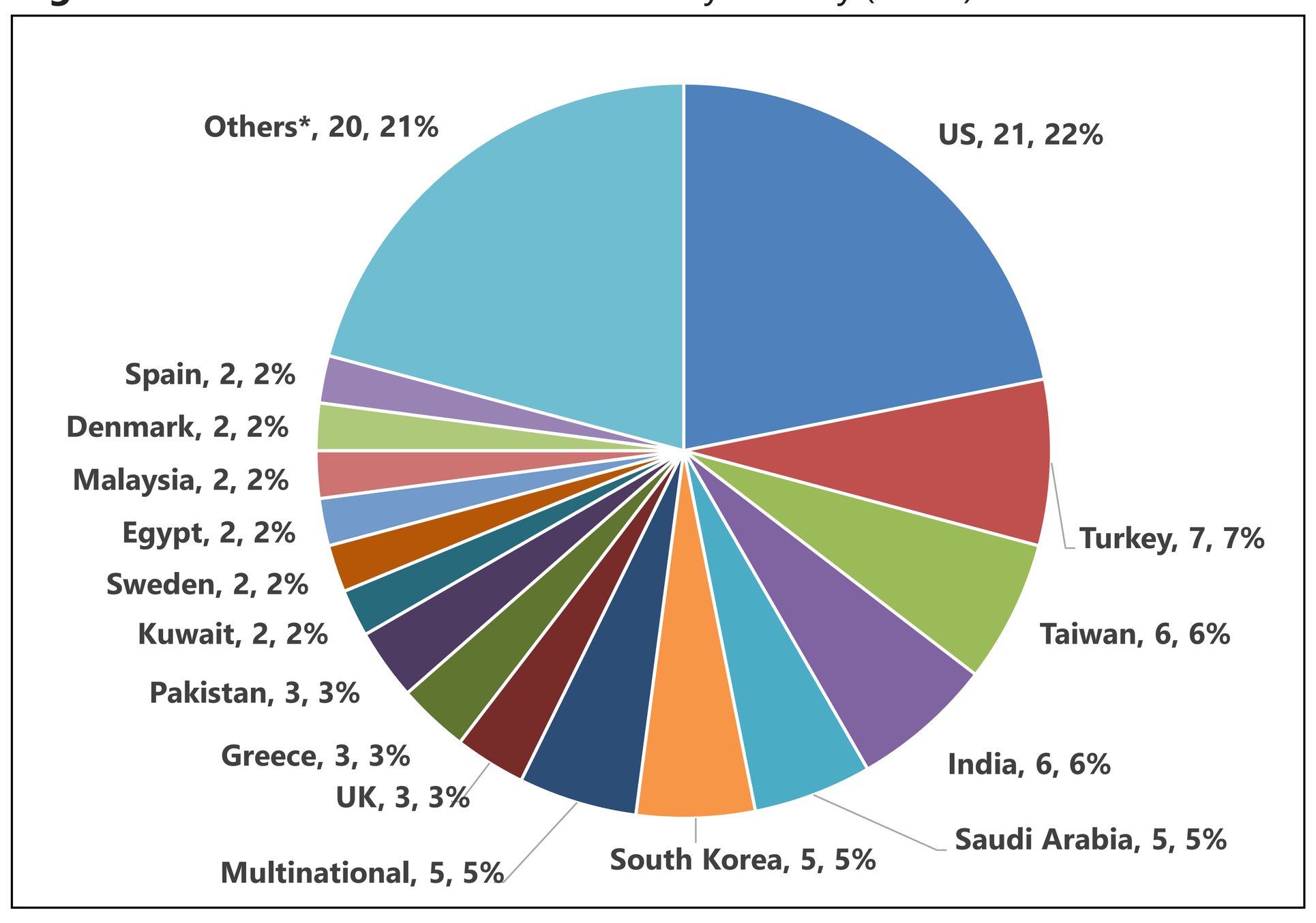
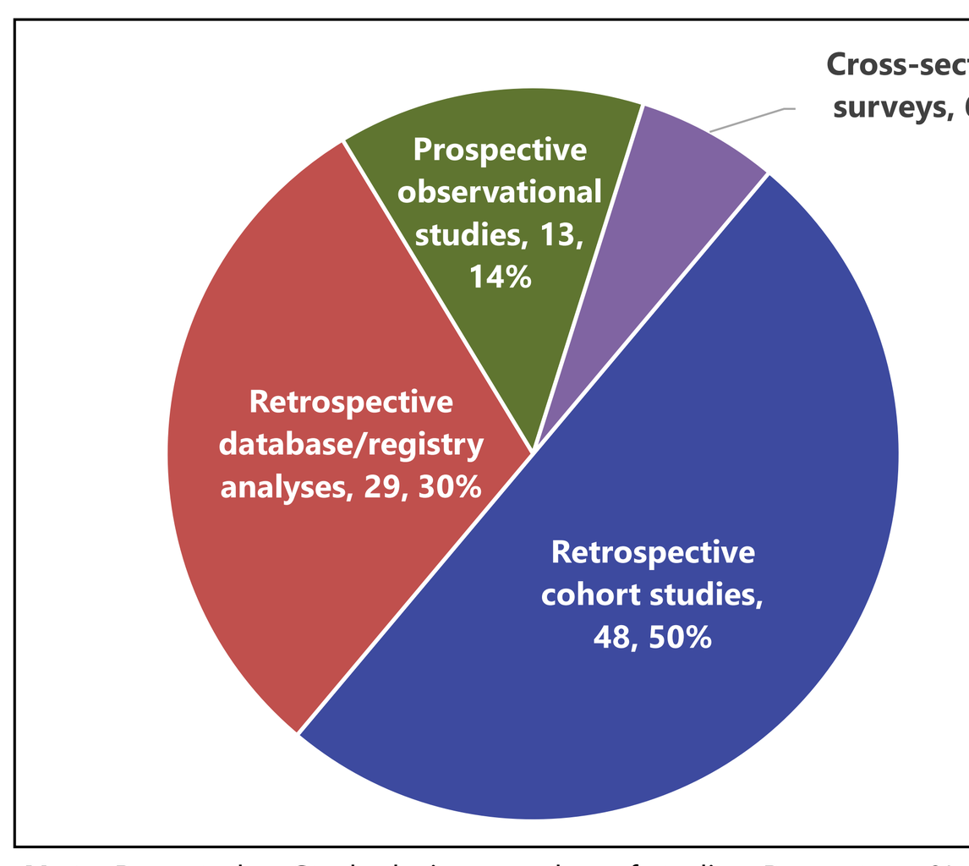


Figure 2. Breakdown of Included Studies by Country (N=96)



Note: Reported as Country, number of studies, Percentage %; *, This included countries that were reported in only one study (Bangladesh, Bosnia and Herzegovina, Brazil, Burkina Faso, Chile, China, Faroe Islands, France, Germany, Iran, Israel, Italy, Japan, Jordan, Lebanon, Netherlands, Singapore, Spain, Sri Lanka, Tanzania, Thailand, Tunisia. **Abbreviations:** USA, United States of America; UK, United Kingdom

Figure 3. Breakdown of Included Studies by Study design (N=96)

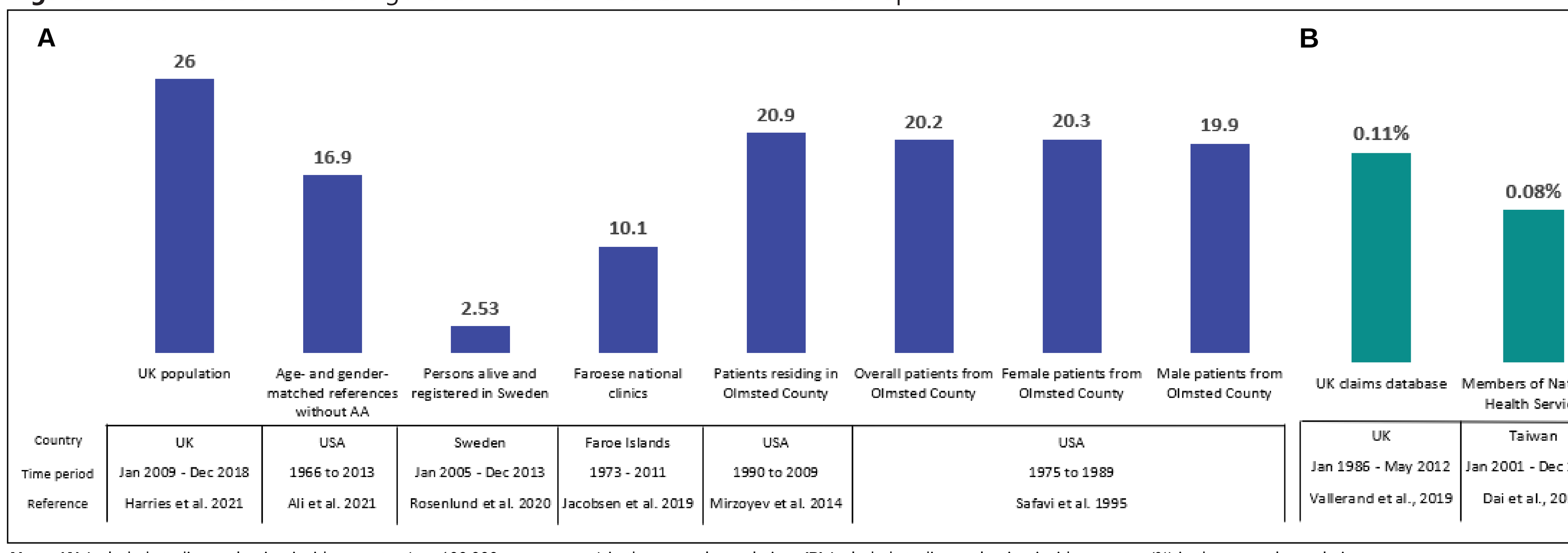


Note: Reported as Study design, number of studies, Percentage %

General population

- Overall incidence rates of AA among the general population were reported in eight studies (**Figure 4**).
  - Among the studies that reported incidence per 100,000 person-years, the rates were between 10.1 and 26.0, except for one study from Sweden with a rate of 2.53.
  - However, this range corresponds to the estimated incidence rate from a retrospective cohort of adult and pediatric AA patients, using electronic healthcare records (EHR) and claims data in the US and UK (Yamakazi et al., 2019); the incidence rate of AA per 100,000 person-years was 1.0 to 25.
- The period prevalence rates of AA in the general population were reported in three studies.
  - In one retrospective study, the period prevalence (%) of AA was 0.01-0.10 (0.08-0.10 in US claims data; 0.01-0.04 in the UK and US EHR)
- The point prevalence rates were reported in 4 cross-sectional surveys, with one each in the USA, France, Brazil, and Saudi Arabia. Whereas lifetime prevalence rates were reported in two studies: one from the USA, and one from Denmark. (**Figure 5 and 6**)

Figure 4. Included Studies Evaluating Incidence Rates in Patients with AA in General Population

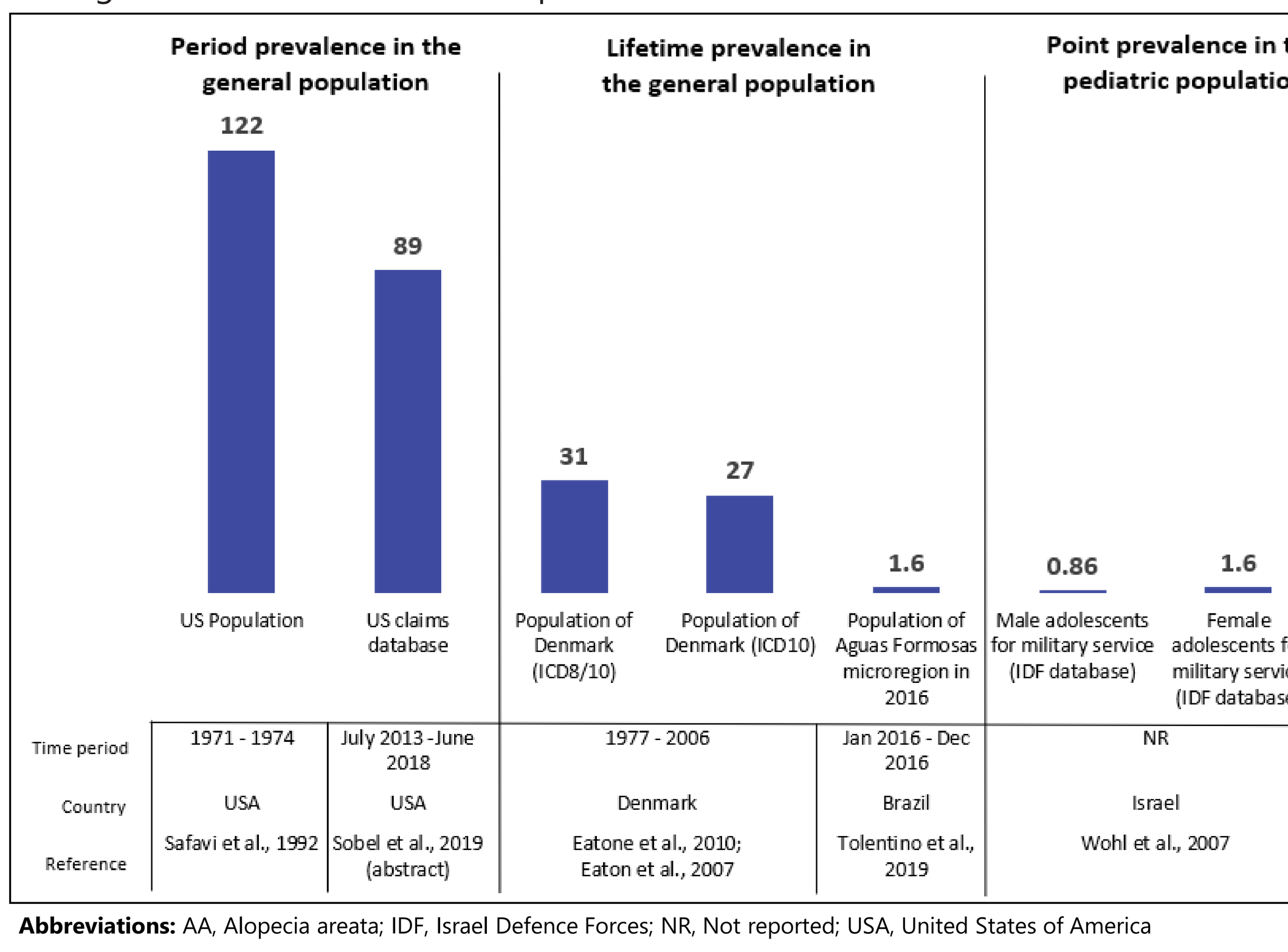


Note: (A) Included studies evaluation incidence rates (per 100,000 person-years) in the general population. **(B)** Included studies evaluation incidence rates (%) in the general population.
Abbreviations: AA, Alopecia areata; USA, United States of America; UK, United Kingdom

Pediatric population

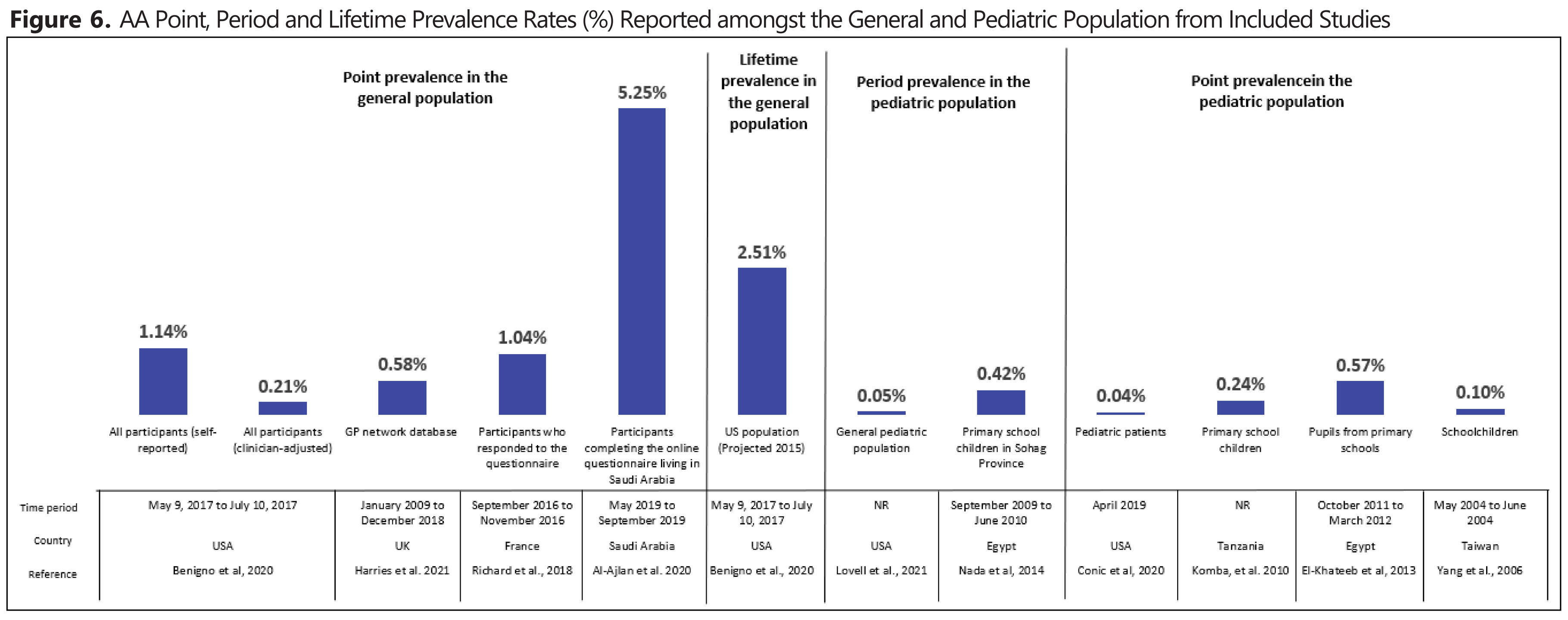
- The incidence rate in the pediatric population was reported to be lower than that in the overall population in one US retrospective registry study (i.e., 16.9 per 100,000 vs. 19.9 to 25 per 100,000 person-years) (Ali et al, 2021).
- Period prevalence of AA in the general pediatric population was 0.05% according to a US study. A much higher prevalence rate (0.42%) was reported among primary school children in an Egyptian study.
- Point prevalence rates amongst the pediatric population were reported in 5 cross-sectional studies, with one each in the USA, Egypt, Tanzania, and Taiwan. Rates among studies involving the pediatric population were varied between studies, ranging from 0.04 to 0.57%. Rates amongst the Israeli adolescent population ranged from 0.86 to 1.60 per 100,000 population, with a higher prevalence in females. (Wohl, 2007)

Figure 5. AA Point, Period, and Lifetime Prevalence Rates (per 100,000 Person-Years) Reported amongst the General and Pediatric Population from Included Studies



Abbreviations: AA, Alopecia areata; IDF, Israel Defence Forces; NR, Not reported; USA, United States of America

Figure 6. AA Point, Period and Lifetime Prevalence Rates (%) Reported amongst the General and Pediatric Population from Included Studies



Abbreviations: AA, Alopecia areata; NR, not reported; USA, United States of America; UK, United Kingdom

Clinic-based Studies:

- Incidence and prevalence rates of AA within outpatient and dermatologic clinics were reported in 27 studies.
- Incidence rates for patients with AA ranged from 0.64% to 4.41%, point prevalence rates ranged from 0.12% to 3.02%, and period prevalence (0 to 5 years) rates ranged from 1.19% to 4.95%.
- Rates were variable across regions and time periods, with ranges for rates in these clinic-based studies tending to be higher than the general population, due to differences in the sample size.

Comorbidities:

- Comorbidities in AA overall population were observed in 10 studies.
- The most frequently reported comorbidities were thyroid disease (1.7-17.8% [in 10 studies]), atopic dermatitis (8.8-24.3% [in 6 studies]), vitiligo (0.4-3.0% [in 4 studies]), depression (6.2-14.7% [in 3 studies]) and obesity (6.2-32% [in 3 studies]).

Clinico-epidemiological profile of AA:

- The incidence of AT or AU ranged from 0 to 0.015 per 1000 person-years according to a UK and US claims database analysis (Yamakazi et al. 2019).
- Estimated prevalence rates over 0 to 5 years for AO, AT, and AU were 0.01-0.07%, 0.08-0.15%, and 0.01-0.07%, respectively.

Rates of AA among other diseases:

- AA was observed as a comorbidity in 13 studies.
- Among these studies, AA rates were reported in dermatologic autoimmune conditions (such as vitiligo, scabies, lichen sclerosis, and erosive lichen planus), celiac disease, inflammatory bowel disease (ulcerative colitis, Crohn's disease), polycystic ovary syndrome, type 1 diabetes, sleep disorders, endometriosis, hidradenitis suppurative, arthritis, and ADHD. (**Figure 7 and 8**)

Figure 7. Reported Incidence Rates (per 1,000 person-years) of AA among Patients with Comorbidities

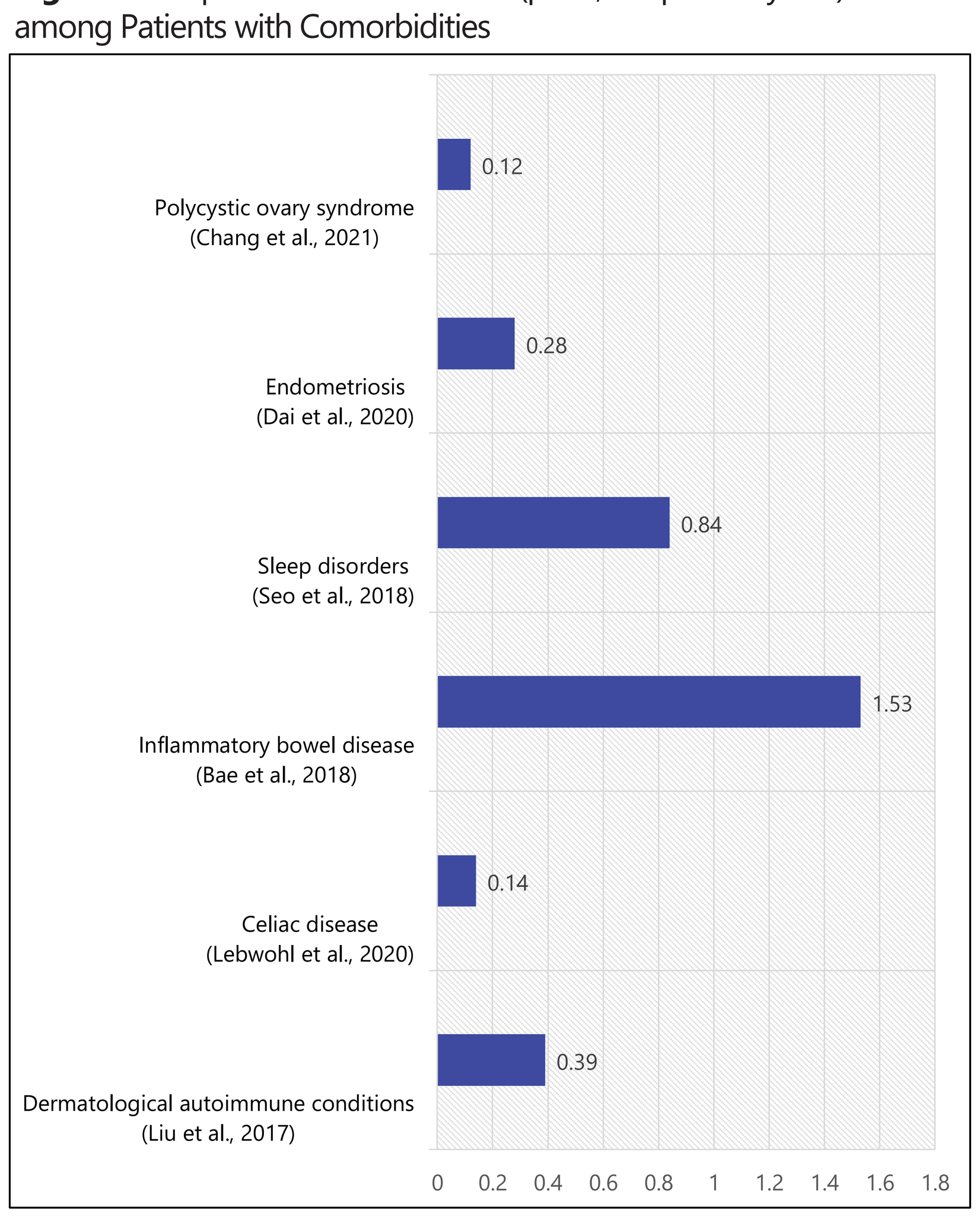
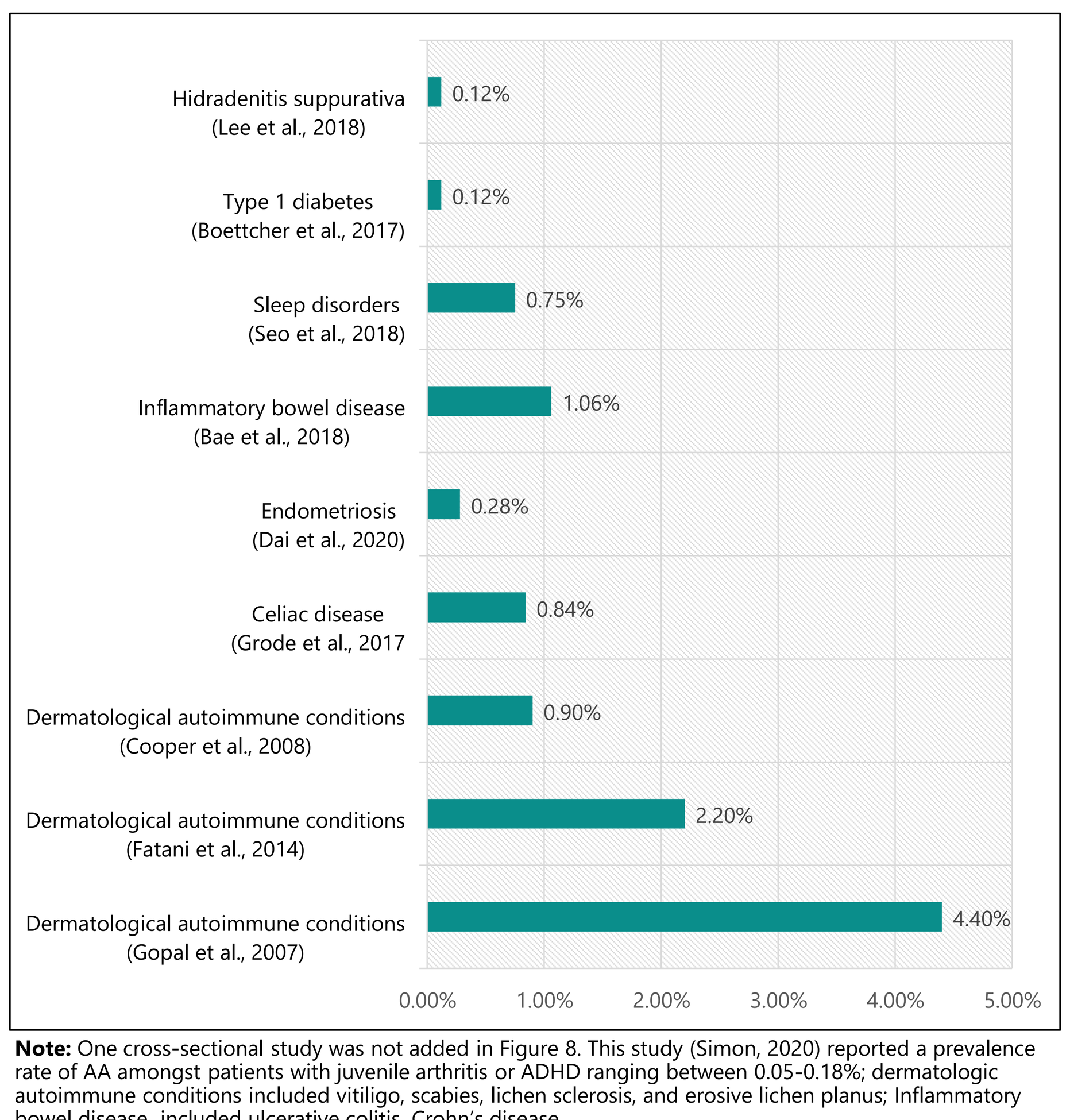


Figure 8. Reported Prevalence Rates (%) of AA among Patients with Comorbidities



Note: One cross-sectional study was not added in Figure 8. This study (Simon, 2020) reported a prevalence rate of AA amongst patients with juvenile arthritis or ADHD ranging between 0.05-0.18%; dermatologic autoimmune conditions included vitiligo, scabies, lichen sclerosis, and erosive lichen planus; Inflammatory bowel disease included ulcerative colitis, Crohn's disease

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DISCLOSURES
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