Zoological Reports
An International Journal
OPEN ACCESS
Narrative Article
Check for updates

The Dermatological Burden of the 2023–2026 Israeli War in the Gaza Strip, Palestine: A Review of Reported Conditions, Environmental Drivers, and Healthcare Challenges

Abdel Fattah N. Abd Rabou*[1], Rola I. Jadallah[2], Aya M. Nbhan[1], Yara M. Alfera[1], Asmaa A. Elmanama[1], Omar S. Naji[3], Somaya A. Jaser[4], Manar M. Mishal[5], Rana I. Al-Tawashi[6], Islam I. Al-Tawashi[7], Kefah A. Leddawi[8], Alaa A. Alqedra[9], Batool F. Aziz[10], Khitam I. Al-Sahhar[11], Mohammed R. Al-Agha[12], Yasser Z. El-Nahhal[12], Islam A. Saleh[13], Ayah M. Hassouna[14], Rasha A. Abd Rabou[15], Mohammed M. Laqqan[15], and Maged M. Yassin[15]

[1]*Department of Biology & Biotechnology, Faculty of Science, Islamic University of Gaza, P.O.Box 108, Gaza Strip, Palestine*
[2]*Department of Biology & Biotechnology, Arab-American University. P.O Box 240 Jenin, 13 Zababdeh, Jenin, Palestine*
[3]*Faculty of Medicine, Al-Quds University, Abu Dis, Palestine*
[4]*MPH Public Health, Al Quds University, Abu Dis, Palestine*
[5]*Department of Medical Optometry, Faculty of Health Sciences, Islamic University of Gaza, Gaza City, Gaza Strip, Palestine*
[6]*Nutrition Sciences and Public Health Program, Palestine Technical College, Deir al-Balah, Gaza Strip, Palestine*
[7]*Arabic Language Teaching Methods Program, Faculty of Education, Al-Aqsa University, Gaza Strip, Palestine*
[8]*Arabic Language Teaching Methods Program, Faculty of Education, Islamic University of Gaza, Gaza Strip, Palestine*
[9]*English Language Teaching Methods Program, Faculty of Education, Al-Aqsa University, Gaza Strip, Palestine*
[10]*Faculty of Medicine, Al-Azhar University, Gaza Strip, Palestine*
[11]*Department of Psychological Counseling, Faculty of Education, Islamic University of Gaza, Gaza Strip, Palestine*
[12]*Department of Environment & Earth Sciences, Faculty of Science, Islamic University of Gaza, Gaza City, Gaza Strip, Palestine*
[13]*Water & Environment Quality Authority, Gaza Strip, Palestine*
[14]*Health Information Unit, Ministry of Health, Gaza Strip, Palestine*
[15]*Faculty of Medicine, Islamic University of Gaza, Gaza Strip, Palestine*

Corresponding author: **Abdel Fattah N. Abd Rabou** | E-mail: **arabou@iugaza.edu.ps**

Citation: Abdel Fattah N. Abd Rabou, Rola I. Jadallah, Aya M. Nbhan, Yara M. Alfera, Asmaa A Elmanama, Omar S. Naji, Somaya A. Jaser, Manar M. Mishal, Rana I. Al-Tawashi, Islam I. Al-Tawashi, Kefah A. Leddawi, Alaa A. Alqedra, Batool F. Aziz, Khitam I. Al-Sahhar, Mohammed R. Al-Agha, Yasser Z. El-Nahhal, Islam A. Saleh, Ayah M. Hassouna, Rasha A. Abd Rabou, Mohammed M. Laqqan, Maged M. Yassin (2026). The Dermatological Burden of the 2023–2026 Israeli War in the Gaza Strip, Palestine: A Review of Reported Conditions, Environmental Drivers, and Healthcare Challenges. *Zoological Reports: An International Journal.* **DOI: https://doi.org/10.51470/ZR.2026.5.2.11**

Received 08 June 2026 | Revised 05 July 2026 | Accepted August 07 2026 | Available Online September 11 2026

Abstract

The prolonged Israeli war in the Gaza Strip since October 2023 has created severe humanitarian and publichealth conditions, including mass displacement, overcrowding, deteriorating water and sanitation services, environmental degradation, and major healthcare disruption. This narrative review synthesizes published evidence and selected health and humanitarian reports on dermatological conditions in the Gaza Strip during 2023–2026, complemented by intermittent field visits, interviews with relevant specialists, and photographic documentation when circumstances permitted. The review examines infectious and parasitic diseases, inflammatory and allergic conditions, burns and traumatic skin injuries, arthropod-associated risks, environmental and nutritional factors, and healthcare challenges.

© **Authors:** *Published in* ***Zoological Reports: An International Journal*** *under the CC BY-NC-ND 4.0 license (http://creativecommons.org/licenses/by-nc-nd/4.0/). No commercial use or modifications permitted.*

Available evidence indicates a substantial dermatological burden, particularly involving scabies, impetigo, and other skin conditions among children and displaced populations. A teledermatology registry documented 12,638 visits during 2025–2026, while clinical studies reported associations between skin diseases, overcrowding, inadequate water and sanitation, displacement, pain, sleep disturbance, and reduced quality of life. Field observations and specialist interviews provided supplementary contextual information but were not treated as representative epidemiological data. Emerging reports also suggest skin and hair changes among nutritionally vulnerable children, although these findings remain incompletely characterized. Overall, dermatological morbidity appears to reflect interacting humanitarian, environmental, nutritional, and healthcare-related factors. However, heterogeneous evidence and incomplete geographic coverage prevent reliable estimation of population-wide prevalence. Strengthening dermatological surveillance, access to treatment, water and sanitation, hygiene resources, nutritional support, and integrated skin-health services is therefore warranted.

Keywords: *Dermatological diseases; scabies; impetigo; dermatitis; psoriasis; burns; displacement; water, sanitation and hygiene (WASH); public health; humanitarian crisis; Israeli war; Gaza Strip; Palestine.*

1. Introduction

The skin is the largest and one of the most externally exposed organs of the human body and is continuously influenced by infectious, environmental, nutritional, chemical, physical, and psychological factors. Consequently, changes in living conditions can influence the occurrence, transmission, severity, and management of dermatological diseases [1,2]. Skin disorders constitute a substantial global public-health burden and include infectious diseases, inflammatory and allergic disorders, parasitic infestations, neoplasms, and other acute and chronic conditions [3].

Wars can intensify this burden through displacement, overcrowding, destruction of homes and infrastructure, inadequate water and sanitation, poor hygiene, environmental deterioration, shortages of medicines, and disruption of healthcare services [4]. These factors are particularly important in temporary and overcrowded shelters, where close contact and limited access to hygiene facilities can facilitate the persistence and transmission of several skin diseases [5]. In the Gaza Strip, these conditions have become closely interconnected since October 2023, following extensive displacement, widespread infrastructure damage, disruption of water and sanitation systems, environmental deterioration, and severe pressure on healthcare services [6-9].

Although dermatological conditions may receive less attention than immediately life-threatening injuries and infections during war, they can cause persistent itching, pain, secondary infection, sleep disturbance, and reduced quality of life. They may also reflect deterioration in living conditions, particularly those involving water, sanitation, hygiene, shelter, and access to healthcare. Understanding the dermatological burden in the Gaza Strip is therefore relevant not only to clinical care but also to broader humanitarian and public-health assessment [10,11].

Recent evidence has substantially improved understanding of this problem. A large teledermatology registry documented 12,638 encounters representing 12,628 patients during February 2025–January 2026. A separate cross-sectional study among children in the Middle Area reported an important burden of scabies and impetigo and identified associations with humanitarian and WASH-related conditions. In addition, a study involving 498 patients demonstrated relationships among dermatological disease, pain, sleep quality, displacement, and dermatology-related quality of life [11-13]. The present review synthesizes the available evidence on dermatological diseases and skin-health risks in the Gaza Strip during the 2023–2026 war, focusing on reported conditions, environmental and humanitarian determinants, vulnerable populations, healthcare challenges, and evidence gaps.

2. Materials and Methods

This study was designed as a narrative literature review. It synthesized published scientific studies, Palestinian epidemiological and dermatological literature, environmental and public-health research, and selected reports from health and humanitarian organizations. In addition, intermittent field visits and interviews with stakeholders were conducted during the war to collect supplementary information and document observed conditions. Photographs were taken whenever circumstances permitted, given the prevailing security and humanitarian constraints.

The review focused on evidence concerning dermatological and dermatology-related conditions in the Gaza Strip during 2023–2026, while selected pre-war studies were used to establish epidemiological and environmental background.

Particular attention was given to scabies, impetigo and bacterial infections, fungal diseases, dermatitis and allergic disorders, psoriasis and other chronic dermatoses, burns and traumatic skin injuries, arthropodassociated risks, displacement, overcrowding, water, sanitation and hygiene (WASH) conditions, environmental degradation, sleep and quality of life, and healthcare disruption.

Because the available studies differed substantially in design, population, geographic coverage, sampling methods, diagnostic approaches, and outcome measures, findings were synthesized qualitatively rather than statistically pooled. Associations were interpreted cautiously, and environmental and humanitarian factors were considered potential contributors unless stronger causal evidence was provided by the original study. Healthcare-based and teledermatology data were not interpreted as population prevalence estimates.

3. Results and Discussion

3.1. Overall dermatological burden

The available evidence indicates that dermatological disease represents an important component of the health burden associated with the 2023–2026 war in the Gaza Strip.

Although skin diseases may receive less attention than immediately life-threatening conditions during complex humanitarian emergencies, they can represent a substantial and persistent component of morbidity among displaced and resource-limited populations [10,14].

Field evidence from displacement settings supports this interpretation. A cross-sectional survey of 500 displaced individuals in the Al-Mawasi region of Khan Younis reported that 28.6% were actively affected by skin diseases and that 42.8% reported developing skin conditions after displacement [15]. These findings indicate a substantial dermatological burden in the studied population, although the study population and sampling approach do not permit extrapolation to the entire Gaza Strip.

The strongest recent healthcare-based evidence comes from the teledermatology registry of Abu Seir et al. [12]. The registry included 12,638 routine-care encounters representing 12,628 unique patients across a cumulative network of 14 Palestine Red Crescent Society medical points between February 2025 and January 2026. Scabies was the leading recorded diagnosis (14.1%), followed by urticaria/allergies (7.3%), impetigo (6.9%), and general/contact dermatitis (6.8%). Ectoparasitic infestations accounted for 18.5% of encounters and bacterial infections for 17.1%.

These findings demonstrate sustained demand for dermatological care during the conflict. However, they should be interpreted as a description of recorded healthcare presentations, not as evidence of populationwide prevalence. The observed pattern reflects disease occurrence together with healthcare access, referral pathways, service availability, and patients' ability to reach functioning medical points.

The available evidence therefore supports a broad interpretation of dermatological morbidity encompassing infectious, parasitic, inflammatory, allergic, traumatic, and potentially arthropod-associated conditions. These conditions occur within an environment characterized by displacement, crowding, disrupted WASH services, environmental deterioration, and healthcare constraints.

3.2. Scabies, impetigo, chickenpox, and other skin infections

Scabies (known in Arabic as *Al-jarab*) is a contagious parasitic skin infestation caused by the microscopic mite *Sarcoptes scabiei*, which burrows into the outer layer of the skin and causes intense itching (Figure 1). Its transmission through prolonged close contact makes it particularly relevant to overcrowded shelters and displaced households. Shared sleeping spaces, limited washing facilities, restricted access to clean clothing and bedding, and difficulties in treating patients and close contacts simultaneously can facilitate continued transmission [16-18]. Direct evidence from the Gaza Strip comes from the 2026 cross-sectional study by Hassan et al. [13], which investigated 409 children with impetigo and/or scabies in the Middle Area of the Gaza Strip. The study was conducted during July–November 2024 and used recruitment from displacement shelters and Red Crescent dermatology clinics. It identified important associations between these conditions and environmental and WASH-related factors, including crowding, limited clean-water access, and sanitation conditions.



Figure 1: Scabies, a contagious parasitic skin infestation caused by the mite Sarcoptes scabiei, among displaced persons—particularly children—in the Gaza Strip during the Israeli war (2023–2026)

The study provides particularly relevant evidence because it links documented childhood skin disease with specific living conditions. Nevertheless, its geographically restricted and non-probability sample means that its findings should not be interpreted as a population-wide prevalence estimate for the Gaza Strip. Repeated transmission is an additional concern. Treatment of one patient may not interrupt transmission when close contacts remain untreated or when the patient returns to a crowded environment with continuing exposure. Appropriate diagnosis, treatment, contact management, hygiene, and access to clean clothing an dbedding are therefore important components of scabies control [16-18]. Impetigo (known in Arabic as Al-*Qobaa*) is a highly contagious, superficial bacterial skin infection commonly caused by *Staphylococcus aureus* and *Streptococcus pyogenes*, characterized by red sores, blisters, and distinctive honey-colored crusts (Figure 2). It is also important in the Gaza Strip context. The pediatric study documented a substantial burden of impetigo and identified relationships with environmental and hygiene conditions [13]. In the same study, 24.2% of participants had both scabies and impetigo, illustrating the potential interaction between parasitic infestation, scratching, skin-barrier disruption, and bacterial infection.



Figure 2: The Gaza Strip is experiencing a significant burden of impetigo, a condition closely linked to harsh environmental conditions and poor hygiene levels during the Israeli war (2023–2026)

Chickenpox (varicella) is a highly contagious viral infection caused by the Varicella-zoster Virus (VZV) and characterized by an itchy vesicular rash. It has also been documented as a communicable disease of concern in the Gaza Strip during the Israeli war (Figure 3). According to the United Nations Office for the Coordination of Humanitarian Affairs [19], approximately 9,300 cases were reported across more than 130 health facilities within two weeks in June 2026, with over half reported in Khan Younis. OCHA linked the increase to overcrowding, deteriorating environmental conditions, and gaps in sanitation and hygiene. These reports highlight the importance of including viral skin diseases alongside parasitic and bacterial infections when examining the dermatological burden among displaced populations [19]. Lice infestation (pediculosis) was also reported in displacement settings, alongside bedbugs and other ectoparasites, reflecting the broader ectoparasitic burden associated with overcrowding and limited hygiene resources.

The teledermatology registry independently identified bacterial infections as an important diagnostic category, accounting for 17.1% of encounters, while impetigo represented 6.9% of recorded diagnoses [12].

Together, these findings indicate that scabies and bacterial skin infections constitute particularly important components of the documented dermatological burden during the war.



Figure 3: Chickenpox (varicella), a highly contagious viral infection caused by varicella-zoster virus (VZV), characterized by an itchy, blister-like rash, in a displaced-persons' tent during the Israeli war in the Gaza Strip (2023–2026)

3.3. Dermatitis, allergic disorders, and fungal diseases

Dermatitis (inflammation of the skin) and allergic disorders (skin conditions caused by hypersensitivity reactions to allergens) were also prominent in the teledermatology registry. General and contact dermatitis accounted for 6.8% of recorded diagnoses, while urticaria or hives (an itchy skin rash characterized by the appearance of raised patches, often red in color) and allergic disorders accounted for 7.3% [12]. Contact with dust, smoke, debris, detergents, contaminated materials, shelter materials, sweat, and other potential irritants may contribute to skin irritation among displaced populations. Limited washing facilities may additionally prolong contact between skin, clothing, bedding, and environmental contaminants.

However, dermatitis is multifactorial, and the available evidence supports an association with the broader humanitarian environment rather than demonstrating that particular wartime exposures caused individual cases. This distinction is important because multiple environmental and psychosocial exposures occur simultaneously during displacement [5,12].

Fungal diseases are another relevant component of the dermatological spectrum. Earlier research documented fungal diseases among residents of parts of the Gaza Strip and demonstrated seasonal variation [20]. Local studies also documented dermatophytosis among outpatients in the Gaza Strip, including *Tinea capitis* (scalp ringworm), a contagious fungal infection of the scalp and hair follicles that requires prescription oral antifungal treatment for cure, and examined molecular approaches to its diagnosis [21,22]. Crowding, sweating, high temperatures, humidity, limited bathing opportunities, and difficulties washing and drying clothing may create favorable conditions for superficial fungal infections [5]. Nevertheless, warspecific quantitative evidence on fungal disease remains considerably weaker than the evidence available for scabies and impetigo. This should be regarded as an evidence gap rather than evidence that fungal disease is unimportant.

3.4. Psoriasis and chronic dermatological disease

The dermatological consequences of war extend beyond infectious diseases. Chronic inflammatory skin conditions, such as psoriasis and eczema, are deeply influenced by psychological and environmental stressors [23-25]. War-related psychological trauma and severe mental stress have long been recognized as significant triggers for the exacerbation and onset of chronic inflammatory skin conditions, particularly psoriasis [26]. In the Gaza Strip, displaced patients with psoriasis face compound vulnerabilities including treatment interruption, lack of systemic therapies, intense itch, and severe sleep disruption [11,27].



Figure 4: Psoriasis, a chronic immune-mediated skin disorder characterized by red, scaly, and often itchy patches, among displaced persons in the Gaza Strip during the Israeli war (2023–2026)

Evidence from the Gaza Strip is provided by Hanani et al. [11], who studied 498 patients with dermatological diseases across three healthcare centers. The study examined dermatological diagnoses together with sleep quality, quality of life, pain, and displacement.

Poor sleep and reduced quality of life were significantly associated with psoriasis, scabies, frequent displacement, and higher pain levels. Adults with psoriasis had the greatest reported impact on quality of life, while sleep quality was particularly poor among participants with scabies. These findings demonstrate why the dermatological burden of the Israeli war should not be measured solely through infection counts. Chronic skin disease can cause substantial disability and psychosocial consequences and may become more difficult to manage when medicines and specialist services are interrupted.

3.5. Pain, pruritus, sleep, displacement, and quality of life

Skin disease may produce a chain of consequences extending beyond the skin itself. Pruritus (itching) and pain can directly interfere with sleep, while sleep disturbance may increase fatigue, psychological distress, and impaired daily functioning. Conversely, psychological stress can aggravate some chronic inflammatory skin disorders [23,25,28]. The Gaza Strip study of 498 patients provides direct evidence of these relationships. Poor sleep and reduced quality of life were associated with several dermatological conditions and with frequent displacement and pain [11].

These findings support considering dermatological morbidity as both a clinical and psychosocial outcome. In displaced populations, repeated movement may simultaneously alter living conditions, exposure patterns, access to medicines, continuity of care, sleep, and psychological stress. The relationship can therefore be conceptualized as interacting rather than strictly linear: War and displacement → disrupted living conditions and healthcare → increased exposure and treatment interruption → skin disease or traumatic skin injury → itching, pain, sleep disturbance, and reduced quality of life. At the same time, stress, sleep disruption, and nutritional insecurity may modify the course of some chronic and inflammatory skin diseases [2,27]. This framework describes interacting pathways rather than a single proven causal chain.

3.6. Children and displaced populations

Children represent an important vulnerable group because they often have close physical contact with other children, depend on adults for hygiene, have limited control over their living environment, and may be unable to avoid crowded sleeping arrangements [29,30]. The Gaza Strip pediatric study provides direct evidence of the relationship between children's skin disease and environmental conditions, particularly for scabies and impetigo [13]. Field evidence from Al-Mawasi region in Khan Younis similarly indicates a substantial burden of skin disease among displaced populations, including children [15]. Displacement can affect dermatological health through several interconnected pathways: Increased interpersonal contact, deterioration of hygiene conditions, limited water availability, repeated exposure to new environments, interruption of treatment, and psychological and socioeconomic stress.

Evidence from other displacement settings demonstrates similar relationships [5,31]. The Gaza Strip situation should therefore be understood not simply as an increased risk of disease transmission but as a disruption of the environmental and healthcare conditions required for prevention, diagnosis, treatment, and recovery.

3.7. Water, sanitation, hygiene, and environmental degradation

Water, sanitation, and hygiene (WASH) are among the most important environmental determinants of infectious and parasitic skin disease. Adequate water is required for bathing, handwashing, cleaning wounds, washing clothing and bedding, and maintaining household hygiene. When water is scarce, drinking and cooking are understandably prioritized, potentially reducing opportunities for personal hygiene [32,33]. Evidence from displacement settings in Khan Younis identified poor hygiene, malnutrition, insect infestations, and overcrowding among factors associated with skin disease [15]. The pediatric study likewise identified associations between skin disease and WASH-related conditions [13].

The Gaza Strip also had serious water and sanitation problems before the current Israeli war. Earlier research documented limitations in water availability, water quality, wastewater management, and environmental protection [33,34]. Local research around the Beit Lahia wastewater treatment plant additionally documented environmental and arthropod-related health concerns [35]. The current war has intensified these pre-existing vulnerabilities through infrastructure damage, displacement, reduced service capacity, and environmental contamination [36-39].

Sanitation is similarly important. Shared toilets and bathing facilities increase interpersonal contact, while damaged wastewater systems, accumulated solid waste, and hazardous occupational exposures create favorable conditions for infectious skin diseases and physical injuries [40,41]. Recent work on household cesspits in the Gaza Strip has highlighted additional environmental and public-health risks associated with emergency sanitation arrangements under wartime conditions [40]. The available evidence therefore supports considering dermatological disease as a WASH-sensitive health outcome, particularly for conditions such as scabies, impetigo, some bacterial infections, and potentially superficial fungal disease [42].

3.8. Burns and traumatic skin injuries

The Israeli war-related fires, explosions, and other hazards contribute directly to dermatological morbidity through thermal burns, blast-related soft-tissue injuries, wounds, and disruption of the skin barrier (Figure 5). A survey of international healthcare workers deployed in the Gaza Strip between August 2024 and February 2025 documented 23,726 trauma-related injuries, with burns representing 4,348 cases (18.3%) [43]. WHO subsequently reported a substantial burden of major burns and continuing rehabilitation needs in the Gaza Strip [44].



Figure 5: The Israeli war on the Gaza Strip causes burns, wounds, and skin-barrier damage through fires and explosions

The consequences of severe burns extend beyond the initial injury. Extensive burns and traumatic wounds can be followed by wound infection, scarring, contractures, chronic pain, pruritus, altered pigmentation, and prolonged functional impairment. Earlier Gaza Strip research documented bacterial organisms, including *Pseudomonas*, *Enterobacter*, and *Staphylococcus* species, in burn wounds, demonstrating the vulnerability of damaged skin to microbial colonization and infection [45].

Management of severe burns and complex wound infections becomes extraordinarily difficult when healthcare systems are disrupted, essential wound-care supplies are blockaded, and infection-control measures are compromised [44,46,47]. Severe injuries may consequently produce prolonged dermatological and functional consequences. Nutritional insecurity may further complicate wound healing because adequate energy, protein, and micronutrient intake are important for tissue repair and immune function. However, the magnitude of the nutritional contribution to dermatological morbidity in the Gaza Strip cannot currently be quantified from the available evidence. Burns and traumatic wounds should therefore be treated as a distinct component of the dermatological burden rather than being grouped with infectious skin diseases (Figure 6). Their contribution is direct and well established, while their longer- term consequences may persist after the acute conflict-related injury has healed.



Figure 6: Burns and traumatic wounds resulting from the Israeli war constitute an important component of the serious skin-condition burden in the Gaza Strip and require specialized care

3.9. Arthropods, rodents, and vector-associated skin risks

Environmental disruption can alter exposure to insects and other arthropods by changing habitats and increasing human–arthropod contact. Earlier research in the Wadi Gaza wetland ecosystem examined inhabitants' knowledge of mosquito proliferation and control, providing a pre-war reference for understanding mosquito-related environmental and public-health issues in the Gaza Strip [48]. In the Gaza Strip, accumulated waste, stagnant water, damaged drainage, altered vegetation, temporary shelters, and reduced pest-control capacity may influence arthropod abundance and human exposure. Recent research has documented medically and public-health-important arthropods in displacement camps and discussed their ecological drivers and potential health risks [49], while field-based observations have reported insect and mouse infestations associated with damaged infrastructure, accumulated waste, inadequate sanitation, and limited pest-control measures [50]. Vertebrate pest outbreaks have also been documented in displacement settings, further indicating the potential for war-related environmental disruption to modify pest exposure and associated public-health risks [51].



Figure 7: Rodent bites and scratches reported on local social media, highlighting the risk of wounds and secondary bacterial infections (photograph taken in early September 2026)

Insect bites may directly produce irritation, inflammation, itching, and skin lesions [52.53]. The widespread proliferation of commensal rodents during the Israeli war in the Gaza Strip, including the House Mouse (*Mus musculus* Linnaeus, 1758), Norway or Brown Rat (*Rattus norvegicus* Berkenhout, 1769), and Black Rat (*Rattus rattus* Linnaeus, 1758) [51,54], has increased exposure to rodent bites and scratches, which can cause wounds and secondary bacterial infections. (Figure 7). Medical consultants and emergency staff in Gaza Strip hospitals have reported increasing rodent-bite cases. Although rodent-associated diseases may have dermatological manifestations [55-57], current evidence does not indicate a significant population-level burden of rodent-associated skin diseases in the Gaza Strip.

Recent observations of phlebotomine sand flies in the Gaza Strip are relevant to cutaneous leishmaniasis surveillance [58]. Cutaneous leishmaniasis is an established disease in Palestine, and previous research has documented its epidemiology, vectors, and environmental determinants [59-63].

However, the presence of sand flies does not by itself demonstrate *Leishmania* transmission or a wartime outbreak. Vector presence, vector infection, human infection, and sustained transmission should be distinguished. This distinction is essential when interpreting ecological observations from the Gaza Strip. Similarly, the documentation of insects, rodents, or other arthropods should be interpreted primarily as evidence of environmental exposure and potential health risk unless clinical or epidemiological evidence establishes a specific disease association (Figure 8).

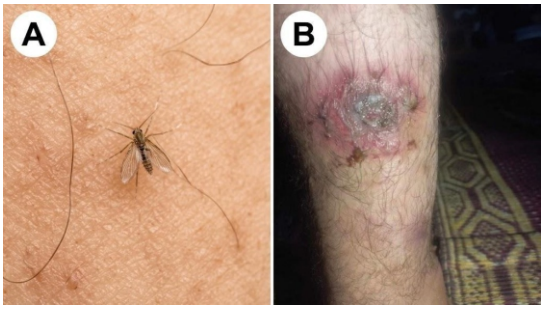


Figure 8: Phlebotomine sandflies (A) and observed skin lesions (B) in the Gaza Strip. Although sandfly activity is evident, cutaneous leishmaniasis remains unconfirmed and requires further investigation.

3.10. Healthcare disruption and treatment challenges

Healthcare disruption is a major determinant of the dermatological burden. During active war, managing bacterial skin infections and preventing transmission in overcrowded health facilities present unprecedented operational challenges due to blockade and resource limits [8,46,64,65]. Nevertheless, delayed diagnosis and treatment can contribute to persistent disease, secondary infection, recurrence, and reduced quality of life. The development of teledermatology during the Gaza Strip war represents an important adaptation. The registry of Abu Seir et al. [12] documented 12,638 routine-care encounters representing 12,628 unique patients across 14 Palestinian Red Crescent Society (PRCS) medical points between February 2025 and January 2026. Scabies, bacterial infections, dermatitis, and allergic disorders accounted for a substantial proportion of recorded presentations. Teledermatology can increase access to specialist input when physical specialist services are constrained [12,66]. However, it cannot fully replace physical examination, laboratory diagnosis, wound care, procedures, management of severe infection, or specialized burn and rehabilitation services. Its effectiveness also depends on electricity, communications infrastructure, trained personnel, and access to supporting clinical services [12,64].

Healthcare disruption also affects wound care, antimicrobial treatment, surgical management, and rehabilitation. This is particularly important for patients with severe burns and extensive traumatic wounds, who may require repeated procedures and prolonged follow-up [43,44,67]. Interrupted access to topical treatments, antiparasitic agents, antibiotics, antifungals, and chronic-disease medications may prolong disease and increase recurrence.

In addition, empirical treatment in settings with limited diagnostic capacity may increase unnecessary antimicrobial exposure, making antimicrobial stewardship particularly relevant in prolonged conflict settings [47].

3.11. Dermatological disease as an indicator of humanitarian conditions

An important interpretation emerging from the available evidence is that some dermatological conditions may provide indirect information about broader humanitarian conditions. The Al-Mawasi region study identified not only a substantial burden of skin disease but also limitations in dermatological health knowledge among displaced people. The study reported that 71.2% of participants lacked adequate preventive knowledge and 74.0% could not identify common skin diseases [15].

Conditions such as scabies, impetigo, recurrent bacterial infections, dermatitis, and arthropod-associated skin problems can be influenced by water availability, sanitation, hygiene, shelter quality, crowding, waste management, displacement, and healthcare access [5,13]. Consequently, dermatological surveillance may complement broader humanitarian surveillance. Changes in the frequency of particular conditions may provide additional information about deterioration in water access, hygiene resources, crowding, shelter conditions, or healthcare accessibility. However, a specific skin disease should not be treated as a direct quantitative indicator of humanitarian conditions. Dermatological surveillance is best considered one component of a broader public-health monitoring system.

3.12. Integrated interpretation and evidence gaps

Overall, the available evidence indicates that the dermatological burden associated with the Gaza Strip war reflects multiple interacting pathways rather than a single disease mechanism. Documented conditions include traumatic injuries and burns, infectious and parasitic diseases such as scabies and impetigo, inflammatory, irritant, allergic, and arthropod-associated conditions, with psychological stress, sleep disturbance, and nutritional insecurity potentially modifying some outcomes.

Emerging evidence also suggests that nutritional insecurity may be accompanied by dermatological and hair changes among vulnerable children. A 2026 report of the Independent International Commission of Inquiry documented dry skin, altered skin pigmentation, and changes in hair texture and color in some children in the Gaza Strip, with clinicians considering these findings consistent with acute malnutrition [30]. However, the available evidence does not establish specific deficiency disorders such as pellagra or zinc-deficiency dermatitis, and such diagnoses should not be inferred without appropriate clinical and laboratory assessment. These observations therefore represent an emerging but incompletely characterized component of the dermatological burden that warrants further investigation.

Conceptually, war-related destruction and displacement → environmental and healthcare disruption → altered exposure, hygiene, wound care, and treatment continuity → diverse dermatological conditions → symptoms, functional impairment, and increased healthcare needs (Figure 9). This framework is not a single proven causal chain; rather, it summarizes interconnected pathways identified across the available evidence, with multiple exposures occurring simultaneously and potentially interacting.



Figure 9: War-related destruction and displacement, together with deteriorating environmental health conditions, may contribute to an increased burden of skin diseases in the Gaza Strip

The three major 2026 Gaza Strip dermatology studies provide complementary evidence. The teledermatology registry demonstrates the scale and clinical spectrum of recorded dermatological healthcare demand; the pediatric study provides direct evidence of associations between scabies/impetigo and environmental and WASH-related factors; and the study of 498 patients demonstrates important relationships between skin disease, displacement, pain, sleep, and quality of life [11-13]. Important evidence gaps remain. There is currently no representative population-based dermatological survey covering the entire Gaza Strip during the 2023–2026 Israeli war. Existing studies differ in population, location, sampling method, diagnostic approach, outcome definition, and observation period. Much of the available evidence concerns children, displaced populations, healthcare users, or teledermatology patients rather than representative population samples.

Consequently, reported proportions should not be interpreted as population-wide prevalence estimates. Healthcare utilization is also strongly influenced by access to functioning facilities and may result in underrepresentation of disease in populations with limited access. Environmental and social exposures frequently occur together, making it difficult to isolate the individual effects of crowding, water insecurity, sanitation problems, displacement, environmental contamination, nutritional insecurity, and psychological stress. Future research should therefore prioritize standardized surveillance and broader geographic coverage [68,69].

Future research should prioritize standardized dermatological case definitions, repeated and geographically representative surveys, age- and sex-specific reporting, and integration of dermatological surveillance with WASH and environmental indicators. Priority areas include surveillance of scabies, impetigo, fungal diseases, burns, chronic and post-traumatic wounds, arthropod- and rodent-associated conditions, antimicrobial resistance, treatment continuity, and patient-reported sleep and quality-of-life outcomes. Longitudinal follow-up would further help determine the magnitude, distribution, and evolution of dermatological morbidity during and after the conflict without overstating what the current evidence can establish.

Conclusion

The available evidence indicates that dermatological disease is an important component of the humanitarian and public-health burden associated with the 2023–2026 war in the Gaza Strip. Reported conditions include scabies, impetigo, chickenpox, other bacterial infections, dermatitis, allergic and fungal diseases, psoriasis, burns, traumatic skin injuries, and arthropod-associated skin problems. Intermittent field visits, specialist interviews, and photographic documentation provided supplementary context to the literature-based findings, although they do not constitute a representative population survey. Evidence particularly highlights the burden of scabies and impetigo among displaced populations facing overcrowding and inadequate water, sanitation, and hygiene, alongside the substantial demand for dermatological care and the effects of skin disease on pain, sleep, and quality of life. Nutritional and deficiency-related skin manifestations among vulnerable children also warrant further investigation. Despite these findings, heterogeneous study designs, restricted geographic coverage, and limited representative data prevent reliable estimation of the overall population burden or definitive attribution of individual conditions to specific wartime exposures. An integrated response combining dermatological surveillance, early diagnosis and treatment, improved water and sanitation, hygiene resources, essential medicines, nutritional support, and accessible skin-health services is therefore needed. Future research should combine standardized epidemiological studies with systematic clinical and environmental assessments to clarify disease patterns, associated factors, and long-term consequences.

ACKNOWLEDGMENTS

The authors gratefully acknowledge the researchers, healthcare professionals, humanitarian organizations, and public-health institutions whose published evidence and reports contributed to this review. Special appreciation is extended to the individuals who generously provided photographs used in this article, which offered valuable visual documentation of the dermatological and humanitarian conditions described and helped illustrate the realities addressed in this review. The authors also acknowledge the healthcare workers and affected communities whose experiences have informed the understanding of dermatological health in the Gaza Strip during the ongoing humanitarian crisis.

References

1. Passeron, T., Krutmann, J., Andersen, M. L., Katta, R., & Zouboulis, C. C. (2020). Clinical and biological impact of the exposome on the skin. *Journal of the European Academy of Dermatology and Venereology*, 34(12), 2677–2685. https://doi.org/10.1111/jdv.16614
2. Slominski, R. M., Raman, C., Jetten, A. M., & Slominski, A. T. (2025). Neuro–immuno–endocrinology of the skin: How environment regulates body homeostasis. *Nature Reviews Endocrinology*, 21(8), 495–509. https://doi.org/10.1038/s41574-025-01107-x
3. Naldi, L., Cazzaniga, S., Flohr, C., Lee, M. M., Fuller, C., Hay, R., Freeman, E. E., Sarkar, R., Romiti, R., Torrelo, A., Lu, Q., Dlova, N., Zaborski Breton, V., Austin, J., Augustin, M., Lim, H., & Borradori, L. (2026). The worldwide burden of skin diseases: Lessons from the Global Burden of Disease data. *Journal of the European Academy of Dermatology and Venereology*. Advance online publication. https://doi.org/10.1111/jdv.70562
4. Levy, B. S., & Sidel, V. W. (2016). Documenting the effects of armed conflict on population health. *Annual Review of Public Health*, 37, 205–218. https://doi.org/10.1146/annurev-publhealth032315-021913
5. Knapp, A. P., Rehmus, W., & Chang, A. Y. (2020). Skin diseases in displaced populations: A review of contributing factors, challenges, and approaches to care. *International Journal of Dermatology*, 59(11), 1307–1315. https://doi.org/10.1111/ijd.15063
6. Dardona, Z., Amane, M., & Boussaa, S. (2024). Top five infectious disease outbreaks among displaced populations during the Gaza conflict 2023–2024: A comprehensive review. *Journal of Infectious Diseases and Epidemiology*, 10(9), 328. https://doi.org/10.23937/2474-3658/1510328
7. Boussaa, S., Dardona, Z., & Amane, M. (2025). Challenges and risk factors for infectious diseases in Gaza due to the current conflict. *Eastern Mediterranean Health Journal*, 31(2), 127–133. https://doi.org/10.26719/2025.31.2.127
8. Pipitone, G., Granata, G., & Kanj, S. S. (2026). Infectious diseases burden of health system collapse in Gaza and Lebanon: A call for action. *The Lancet Regional Health – Europe*, 69, Article 101412. https://doi.org/10.1016/j.lanepe.2025.101412
9. Salem, H. S. (2026). The current Israeli war 2023–2025 on the Gaza Strip, occupied Palestine, based on social, economic, public health, environmental, geopolitical, and human rights' perspectives. *Environmental Justice*, 19, 1392465. https://doi.org/10.1089/env.2025.0042
10. Fernández Camporro, Á., & Arcos González, P. (2026). Skin diseases: The forgotten problem in complex humanitarian emergencies. *Disaster Medicine and Public Health Preparedness*, 20, e37. https://doi.org/10.1017/dmp.2025.10282
11. Hanani, A., Sammour, A. A. H., Skaik, A. N., Lulu, I. S., Saadeh, Y. H., AbedAlnabi, S. I., Almassri, A. S. Y., Abu Heen, L., El-Kahlout, S. M., & Al-Zoghby, H. M. (2026). Sleep quality and quality of life in patients with dermatological diseases during the war in Gaza. *Scientific Reports*, 16, 17763. https://doi.org/10.1038/s41598-026-46802-5
12. Abu Seir, R., Alshawwa, K., Ayyad, M. K., Abu Serriya, R., Hamarshi, M., & Sethi, A. (2026). Dermatological disease patterns during active conflict: A teledermatology registry of 12,638 patient visits in Gaza, 2025–2026. *Scientific Reports*, 16. https://doi.org/10.1038/s41598-02671577-0
13. Hassan, A. S. M., Barakat, A. H. H., Abudayya, D. M. H., Abulkhair, L. M. S., Abu Amra, M. A. R. S., Abdullateif, N. N. E., Owais, T. A., Sabboh, M., Suliman, J., Warasna, H. J. M., Awad, M. Y. H., & Abu Serriya, R. A. A. (2026). A cross-sectional study of the burden and risk factors of impetigo and scabies among children during conflict in the middle area of the Gaza Strip. *Scientific Reports*, 16, 8422. https://doi.org/10.1038/s41598-026-38441-7
14. Rabayaa, M. (2026). Beyond the battlefield: An analysis of the war-related health impacts in the Gaza Strip, Palestine. *Frontiers in Public Health*, 14, Article 1739474. https://doi.org/10.3389/fpubh.2026.1739474
15. Dardona, Z., El-Khairy, L. Y., Masad, A. A., Amane, M., Serhan, B. M. A., Nabhan, S. O., & Boussaa, S. (2026). Burden of skin diseases in war-induced displacement settings: Evidence from Mawasi Khan Younis Camps, Gaza, Palestine. *Our Dermatology Online*, 17(4), 435–443.
16. Hamarsheh, O. (2021). Epidemiology of scabies in Palestine. In I. Laher (Ed.), *Handbook of healthcare in the Arab world* (pp. 3099–3112). Springer.
17. World Health Organization. (2023). *Scabies*. World Health Organization.
18. Strahan, A. G., & Elston, D. M. (2024). Dermatologic care for refugees: Effective management of scabies and pediculosis. *Cutis*, 113(4), E16–E21. https://doi.org/10.12788/cutis.0999
19. Office for the Coordination of Humanitarian Affairs (OCHA). (2026). *Humanitarian situation report | 3 July 2026*. https://www.ochaopt.org/content/humanitarian-situation-report-3-july-2026
20. El-Kichaoi, A. (2007). Prevalence and seasonal variation of fungal diseases among inhabitants of parts of Gaza-Palestine. *Annals of Alquds Medicine*, 2(1), 45–52.
21. Al-Laham, N. A., Abdelateef, N., & Naieem, M. (2011). Dermatophytosis among outpatients in Gaza, particularly Tinea capitis. *Journal of Al-Azhar University-Gaza (Natural Sciences)*, 13, 17–30.
22. Ayesh, E. K., & Bashiti, T. A. (2017). Improving the diagnosis of dermatophytes in Gaza Strip by using nested PCR. *European Journal of Biotechnology and Bioscience*, 5(2), 54–61.
23. Kimyai-Asadi, A., & Usman, A. (2001). The role of psychological stress in skin disease. *Journal of Cutaneous Medicine and Surgery*, 5(2), 140–145. https://doi.org/10.1177/120347540100500208
24. Heller, M. M., Lee, E. S., & Koo, J. Y. M. (2011). Stress as an influencing factor in psoriasis. *Skin Therapy Letter*, 16(5), 1–4.
25. Zhang, H., Wang, M., Zhao, X., Wang, Y., Chen, X., & Su, J. (2024). Role of stress in skin diseases: A neuroendocrine-immune interaction view. *Brain, Behavior, and Immunity*, 116, 286–302. https://doi.org/10.1016/j.bbi.2023.12.005
26. Arslanagić, N., & Arslanagić, R. (2003). Effect of psychological trauma caused by war on manifestations of psoriasis. *Medicinski Arhiv*, 57(3), 145–147.

27. Moafa, T. A., Mojiri, M. E., Alattas, K. H., Sumayli, A. M., Alnujaidi, E. H., Alharbi, M. O., Manni, R. M., Hibili, N. H., Alomir, F. A., Almutairi, F. M., & Alhusayni, S. (2025). The impact of sleep dysfunction on inflammatory skin diseases: A systematic review. *Cureus*, 17(12), e99598. https://doi.org/10.7759/cureus.99598

28. Nowosielska, D., Wolska, H., Pawliczak, R., & Wolska, A. (2021). Nocturnal pruritus and sleep disturbance associated with dermatologic disorders in adult patients. *International Journal of Women's Dermatology*, 7(4), 403–410. https://doi.org/10.1016/j.ijwd.2021.02.010

29. Kadir, A., Shenoda, S., Goldhagen, J., Pitterman, S., & Section on International Child Health. (2018). The effects of armed conflict on children. *Pediatrics*, 142(6), e20182586. https://doi.org/10.1542/peds.2018-2586

30. Independent International Commission of Inquiry on the Occupied Palestinian Territory, including East Jerusalem, and Israel. (2026). *"The essence of childhood has been destroyed": Israel's deliberate targeting of Palestinian children in the Occupied Palestinian Territory since 7 October 2023*. Human Rights Council, A/HRC/62/CRP.2.

31. Elfaituri, S. S. (2016). Skin diseases among internally displaced Tawerghans living in camps in Benghazi, Libya. *International Journal of Dermatology*, 55(9), 1000–1004. https://doi.org/10.1111/ijd.13115

32. Al-Agha, M. R. (1997). Environmental management in the Gaza Strip. *Environmental Impact Assessment Review*, 17(1), 65–76.

33. Shomar, B. (2011). Water scenarios in the Gaza Strip, Palestine: Thirst, hunger and disease. *International Journal of Environmental Studies*, 68(4), 477–493. https://doi.org/10.1080/00207233.2011.582726

34. Bellisari, A. (1994). Public health and the water crisis in the occupied Palestinian territories. *Journal of Palestine Studies*, 23(2), 52–63. https://doi.org/10.2307/2538231

35. Dardona, Z., Amane, M., Dardona, A., & Boussaa, S. (2025). Health and environmental impacts of Gaza conflict (2023–2024): A review. *One Health Bulletin*, 5(1), 1–12. https://doi.org/10.4103/2773-0344.394101

36. Abd Rabou, A. N. (2011). Environmental impacts associated with the Beit Lahia wastewater treatment plant, North Gaza Strip, Palestine. *Middle-East Journal of Scientific Research*, 7(5), 746–757.

37. Turkman, N., Alfarra, M., Assi, N., Judeh, A., & Hamdan, M. (2025). Water quality and its role in waterborne disease outbreaks during the war on the Gaza Strip. *Journal of Global Public Health*, 3(1), 1–19.

38. Office for the Coordination of Humanitarian Affairs (OCHA). (2026). *Humanitarian situation reports: Occupied Palestinian territory*. United Nations Office for the Coordination of Humanitarian Affairs.

39. United Nations Children's Fund (UNICEF). (2026). *UNICEF in the State of Palestine humanitarian situation updates: Water, sanitation and hygiene in the Gaza Strip*. UNICEF State of Palestine.

40. Abd Rabou, A. N., Abu Shaheen, I. S., Baraka, H. I., Baraka, G. I., Abd Rabou, O. A., Salha, R. E., Jouda, R. M., Idais, R. H., Al-Banna, M. S., Tanboura, A. A., Abd Rabou, A. A., Tayeh, B. A., Abualtayef, M. T., Rabah, F. K., Al-Harazeen, H. R., Abu Alajeen, R. A., Elhabiby, M. I., Al-Agha, M. R., & Yassin, N. M. (2026). Environmental and public health risks associated with household cesspits in the Gaza Strip, Palestine, under wartime conditions (2023–2026). *Journal of Diversity Studies*, 5(2), 199–213. https://doi.org/10.51470/JOD.2026.5.2.199

41. Neiroukh, H., Shami, S., Juabeh, M. I., Darbadwan, L., Taha, S., Maqboul, I., & Damiri, B. (2025). Occupational hazards and health risks among sanitation workers in Palestine: A cross-sectional study on injuries and skin conditions. *Scientific Reports*, 15(1), Article 43635. https://doi.org/10.1038/s41598-025-83210-y

42. World Health Organization & United Nations Children's Fund. (2024). *Infection prevention and control and water, sanitation and hygiene measures in health-care settings and shelters/congregate settings in Gaza: Technical note, 22 February 2024*. World Health Organization.

43. El-Taji, O., Ali, A., Alser, O., Ghali, A., Jomaa, A., Sultan, M. J., Irfan, B., Jafar, A., Qandil, M., Jeelani, A., Darwish, A., Mokhallalati, A., McMonagle, M., Rose, V., Mamode, N., Khan, S., Maynard, N., Nott, D., & Swee Chai, A., et al. (2025). Patterns of war related trauma in Gaza during armed conflict: Survey study of international healthcare workers. *BMJ*, 390, e087524. https://doi.org/10.1136/bmj-2025087524

44. World Health Organization. (2026). *One in four injuries in Gaza is life-changing while rehabilitation services struggle to keep pace, WHO reports*. WHO Regional Office for the Eastern Mediterranean.

45. Al-Laham, N. A., Elmanama, A. A., & Tayh, G. A. (2013). Possible risk factors associated with burn wound colonization in burn units of Gaza Strip hospitals, Palestine. *Annals of Burns and Fire Disasters*, 26(2), 68–75. https://doi.org/10.12890/2013_000010

46. Irfan, B., Lulu, I., Hamawy, A., Shammala, A. A., Kullab, S., Fawaz, M., & Saleh, K. J. (2025). Combating infections under siege: Healthcare challenges amidst the military assault in Gaza. *World Medical & Health Policy*, 17(1), 188–213. https://doi.org/10.1002/wmh3.612

47. Kumar, R., Tanous, O., Mills, D., Wispelwey, B., Asi, Y., Hammoudeh, W., & Dewachi, O. (2025). Antimicrobial resistance in a protracted war setting: A review of the literature from Palestine. *mSystems*, 10(6), e01679-24. https://doi.org/10.1128/msystems.01679-24

48. Abd Rabou, A. N., Yassin, M. M., Sharif, F. A., Al-Agha, M. R., Daher, K. S. A., Ali, A. K. S., & Hamad, D. (2008). Inhabitant's knowledge on mosquito proliferation and control in the wetland ecosystem of Wadi Gaza, Gaza Strip, Palestine. *IUG Journal of Natural Studies*, 16(2), 1–14.

49. Abd Rabou, A. N. (2026). Medically and public health–important arthropods in Gaza Strip displacement camps during the Israeli war (2023–2026): Documented and potential occurrence, ecological drivers, health risks, and humanitarian implications. *Journal of Diversity Studies*, 5(2), 112–127. https://doi.org/10.51470/JOD.2026.5.2.112

50. Dardona, Z., & Boussaa, S. (2025). Insect and mice infestations in Gaza displacement camps: A field-based study on vector-borne diseases amid the 2023–2025 Gaza War. *Public Health Challenges*, 4(4), e70127. https://doi.org/10.1002/puh2.70127

51. Abd Rabou, A. N., Elhabiby, M. I., Gafar, M. F., Alfera, Y. M., El-Hindi, M. W., Ibrahim, Y. K., Al-Banna, M. S., Idais, R. H., Tanboura, A. A., Alsalibi, T. M., Qaraman, A. A., Al-Agha, M. R., Abd Rabou, M. A., Dardona, A. W., Shawa, S. S., Abd Rabou, O. A., Tayeh, B. A., Rabah, F. K., Abualtayef, M. T., Abd Rabou, A. A., & Yassin, M. M. (2026). Vertebrate pest outbreaks in Gaza displacement camps under conditions of war (2023–2026): Ecological drivers, public health risks, and humanitarian impacts. *Journal of Diversity Studies*, 5(2), 5–22. https://doi.org/10.51470/JOD.2026.5.2.05

52. El-Nahhal, Y., & El-Nahhal, I. (2021). Cardiotoxicity among children accidentally exposed to organophosphate insecticides coupled with scorpion bites in Gaza. *Health*, 13(9), 1045–1063.

53. Dehghani, R., Fathi, B., Dehghani, M., & Mohamadzadeh, N. (2025). Venomous and poisonous arthropods in Iran, West Asia, and the Middle East: An overview of their identification, bites, stings, behavior, biology and geographical distribution. *Iranian Journal of Veterinary Science and Technology*, 17(1), 1–36. https://doi.org/10.22067/ijvst.2025.92244.1483

54. Abd Rabou, A. N. (2026). Control measures for commensal rodent infestations in the Gaza Strip, Palestine, during Israel's ongoing war (2023–2026). *Journal of Diversity Studies*, 5(2), 143–157. https://doi.org/10.51470/JOD.2026.5.2.143

55. Elliott, S. P. (2007). Rat-bite fever and Streptobacillus moniliformis. *Clinical Microbiology Reviews*, 20(1), 13–23. https://doi.org/10.1128/CMR.00016-06

56. Kämmerer, T., Kämmerer, J., & Wölfel, R. (2021). Rodent-borne infectious disease hazards in military deployments and complex humanitarian emergencies. *Journal of Military and Veterans' Health*, 29(4), 45–52.

57. Mahmoudi, A., Mostafavi, E., & Zarei, Z. (2024). Rodent-borne zoonoses in conflict and disaster settings: A systematic review of cutaneous and systemic manifestations. *Frontiers in Public Health*, 12, Article 1348921. https://doi.org/10.3389/fpubh.2024.1348921

58. Abd Rabou, A. N., Al-Shafei, A. A., Elmanama, A. A., Fayad, N. A., El-Hindi, M. W., Alfera, Y. M., Abu Shaheen, I. S., Mishal, M. M., Tanboura, A. A., Idais, R. H., Shawa, S. S., Elhabiby, M. I., Yassin, M. M., Qaraman, A. A., & Al-Agha, M. R. (2026). Preliminary evidence of phlebotomine sand flies in the Gaza Strip, Palestine, during the 2023–2026 war. *Journal of Entomology and Zoology Studies*, 14(5), 74–85. https://doi.org/10.22271/j.ento.2026.v14.i5a.9874

59. Sawalha, S. S., Shtayeh, M. S., Khanfar, H. M., Warburg, A., & Abdeen, Z. A. (2003). Phlebotomine sand flies (Diptera: Psychodidae) of the Palestinian West Bank: Potential vectors of leishmaniasis. *Journal of Medical Entomology*, 40(3), 321–328. https://doi.org/10.1603/0022-2585-40.3.321

60. Sawalha, S. S., Ramlawi, A., Sansur, R. M., Salem, I. M., & Amr, Z. S. (2017). Diversity, ecology, and seasonality of sand flies (Diptera: Psychodidae) of the Jenin District (Palestinian Territories). *Journal of Vector Ecology*, 42(1), 120–129. https://doi.org/10.1111/jvec.12247

61. Jaffe, C. L., Baneth, G., Abdeen, Z. A., Schlein, Y., & Warburg, A. (2004). Leishmaniasis in Israel and the Palestinian Authority. *Trends in Parasitology*, 20(7), 328–332. https://doi.org/10.1016/j.pt.2004.05.001

62. Azmi, K., Schonian, G., & Abdeen, Z. (2020). Specification of blood meals ingested by female sand flies caught in Palestinian foci and identification of their concomitant leishmanial infections. *PLOS Neglected Tropical Diseases*, 14(10), e0008748. https://doi.org/10.1371/journal.pntd.0008748

63. Amro, A., Moskalenko, O., Hamarsheh, O., & Frohme, M. (2022). Spatiotemporal analysis of cutaneous leishmaniasis in Palestine and foresight study by projections modelling until 2060 based on climate change prediction. *PLOS ONE*, 17(6), e0268264. https://doi.org/10.1371/journal.pone.0268264

64. Taha, S. (2025). Palestinian dermatology: Exploring policies, challenges, and opportunities in fragile and conflict-affected settings. *International Journal for Equity in Health*, 24, 170. https://doi.org/10.1186/s12939-025-02551-x

65. Farhadi, N., Yarahmadi, A., & Afkhami, H. (2026). Infectious diseases and antimicrobial resistance in the Gaza Strip: Epidemiological drivers, health system disruptions, and global implications: A narrative review. *Health Science Reports*, 9(5), e72074. https://doi.org/10.1002/hsr2.72074

66. Marji, J. S., & Marji, M. A. (2025). Dermatologic research in displaced populations: Importance, challenges, and proposed solutions. *JMIR Dermatology*, 8, e64828. https://doi.org/10.2196/64828

67. World Health Organization. (2025). *HeRAMS occupied Palestinian territory: Gaza infographics, May 2025*. World Health Organization.

68. Andrews, J. R., Barkume, C., Yu, A. T., Saha, S. K., Qamar, F. N., Garrett, D., & Luby, S. P. (2018). Integrating facility-based surveillance with healthcare utilization surveys to estimate enteric fever incidence: Methods and challenges. *The Journal of Infectious Diseases*, 218(Suppl. 4), S268–S276. https://doi.org/10.1093/infdis/jiy494

69. Awad, R., Al-Rahman Omer, A., & Abu Shahla, N. (2001). A critical review of the infectious diseases surveillance system in the Gaza Strip. *Eastern Mediterranean Health Journal*, 7(1–2), 274–279. https://doi.org/10.26719/2001.7.1-2.274