https://doi.org/10.18502/jad.v20i2.22412

Letter to the Editor

War and the Landscape of Vector-Borne Diseases in the World Health Organization Eastern Mediterranean Region: Operational Challenges for Public Health in Protracted Crises

Mohammad Mehdi Sedaghat[1], *Jalil Nejati[2], Rubén Bueno-Marí [3,4]

[1]Department of Vector Biology and Control of Diseases, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran
[2]Health Promotion Research Center, Zahedan University of Medical Sciences, Zahedan, Iran
[3]Departamento de Investigación y Desarrollo (I+D), Laboratorios Lokímica, Valencia, Spain
[4]Parasites and Health Group, Department of Pharmacy, Pharmaceutical Technology and Parasitology, Faculty of Pharmacy, University of Valencia, Spain

***Corresponding author:** Dr Jalil Nejati, E-mail: jalilnejati@yahoo.com; j.nejati@zaums.ac.ir

(Received 04 May 2026; accepted 06 Jun 2026)

Dear Editor

Globally, vector-borne diseases (VBDs) account for nearly 20% of the estimated burden of infectious diseases. Within the 22 countries of the World Health Organization Eastern Mediterranean Region (EMR), home to approximately 8% of the world's population, nearly 11% of the global VBDs burden is concentrated. Some parasitic diseases, especially malaria, trypanosomiasis, schistosomiasis, onchocerciasis, loiasis, dracunculiasis and both cutaneous and visceral leishmaniasis, continue to be reported in several countries of the region (1). Furthermore, recent regional evidence highlights a substantial diversity of at least 73 arthropod-borne and arthropod-related viruses circulating across EMR countries, notably dengue, West Nile, Crimean-Congo hemorrhagic fever, Rift Valley fever, Japanese encephalitis, yellow fever, sandfly fever and chikungunya (2).

Armed conflicts and humanitarian crises profoundly reshape the epidemiology of VBDs. The breakdown of infrastructure, population displacement and ecological disruption favor the resurgence of parasitic and arboviral diseases, particularly across the Eastern Mediterranean, a region marked by recurrent conflicts (3).

Environmental disruption and vector proliferation

Damage to water and sanitation systems during war can have important entomological consequences. Interrupted water supplies, makeshift water storage, and broken sewer networks can create breeding conditions favorable for *Aedes*, *Anopheles* and *Culex* mosquitoes, while poor waste management and debris accumulation support the expansion of *Phlebotomus* sand flies and rodent reservoirs. For instance, Syria has experienced a marked resurgence of cutaneous leishmaniasis due to the collapse of solid waste management and vector control programs during the protracted conflict. In addition, bombing-related structural damage, such as cracks in buildings and the accumulation of rubble and debris, may have further promoted suitable breeding and resting conditions for sand flies (4). Similarly, in Yemen, the destruction of water infrastructure has been associated with increased dengue and malaria transmission, placing immense pressure on an already strained health system (5). The Iran-Iraq war (1980–1988) underscores the operational challenges of managing VBDs in conflict zones. The deployment of troops in natural environments, together with disruptions in control activities, led to a notable resurgence

http://jad.tums.ac.ir
Published Online: June 30, 2026

Copyright © 2026 The Authors. Published by Tehran University of Medical Sciences.
This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International license (https://creativecommons.org/licenses/by-nc/4.0/). Non-commercial uses of the work are permitted, provided the original work is properly cited.

https://doi.org/10.18502/jad.v20i2.22412

of parasitic and arboviral conditions, especially cutaneous leishmaniasis, scabies, pediculosis and sandfly fever. This experience highlights how the lack of essential protective equipment and the inability to sustain field interventions during protracted conflict can significantly exacerbate the risk of VBDs among vulnerable populations (6). Overcrowded and unhygienic settings further facilitate ectoparasite transmission, including lice and mites, associated with louse-borne infections (3). Reports on the military aggression against Iran during Ramadan, known as the "Ramadan War," describe damage to vital infrastructure, including water resources and environmental monitoring centers, together with widespread air, water and soil contamination (7). These environmental disruptions may create conditions that complicate vector surveillance and control, although the report does not provide direct evidence on vector-borne disease transmission.

Displacement, camp conditions and VBD outbreak potential

Forced migration and temporary camps amplify transmission, as overcrowding, inadequate sanitation and limited vector control contribute to outbreaks of pediculosis and scabies. A post-conflict study in Gaza documented a significant rise in these conditions among camp populations, with reports indicating approximately 96,417 confirmed cases of scabies since October 7, 2023, alongside over 68,000 recorded cases of scabies and lice among displaced individuals within the first few months of the war (8).

Behavioral changes increase exposure to arthropods

Conflict frequently forces families to sleep outdoors or in damaged shelters without protective measures such as bed nets or repellents. An analysis across 52 countries demonstrated that intense conflict was significantly associated with an approximately twofold higher risk of cutaneous and mucocutaneous leishmaniasis (9).

Collapse of public health services and surveillance

War undermines essential public health functions, including larval monitoring, adult vector sampling, diagnostic capacity and timely reporting. Conflict can threaten the availability of insecticides, rapid diagnostic tests and essential medications. Moreover, the loss of experienced personnel further complicates the implementation of vector control and surveillance activities, limiting the capacity of health systems to respond effectively. As a result, diseases that were previously controlled or even eliminated may re-emerge (10). For instance, the twelve-day war in Iran showed that damage to health infrastructure, population displacement, and disruption of service delivery can weaken the capacity of the health system (11). In addition, extensive sanctions and prolonged conflict can adversely affect the functioning of the health system (12). Although direct evidence for disruption of vector-control activities in Iran remains limited, pressure on the health system may still compromise VBD surveillance, patient care and related service delivery.

Challenges and adaptations in vector control during conflict

A 2023 systematic review and meta-analysis found that indoor residual spraying is often limited in conflict and displacement settings, where housing instability and operational constraints reduce its effectiveness. The review highlights an urgent need for emergency-specific vector control tools, such as insecticide-treated shelter materials, blankets and nets, to complement conventional interventions in highly unstable settings (13).

Public health crisis and the need for regional preparedness

Ongoing and emerging conflicts in the EMR have created, and will likely continue to sustain, a concerning landscape for vector-borne diseases. This underscores the urgent

http://jad.tums.ac.ir
Published Online: June 30, 2026

https://doi.org/10.18502/jad.v20i2.22412

need for a targeted, effective and life-saving public health response that addresses the humanitarian crises at hand. The success of interventions aligned with humanitarian minimum standards is influenced by human behavior, environmental conditions and local ecological contexts during these crises. Effective regional collaboration and ongoing international support are vital for the success of these efforts. Implementing strategies such as integrated vector management, community education, enhancing entomological expertise and reinstating essential diagnostic services in conflict-affected areas can help mitigate immediate threats.

Ultimately, these challenges should not be viewed as isolated incidents but as an interconnected operational framework. Our perspective underscores the urgent need to shift from vertical disease control programs toward an integrated health-security approach that addresses the combined impact of war-driven environmental changes, population displacement and weakened local surveillance capacity (14). Figure 1 provides a conceptual synthesis of the pathways through which armed conflict amplifies vector-borne disease risk and constrains surveillance and control activities in the EMR.

While these insights offer a framework for integrated action, it is important to acknowledge that most evidence from the crisis zones is derived from ecological studies or camp-based surveillance, which may be subject to reporting biases and limited applicability to wider populations. The collapse of formal health systems often results in under-reporting, making it difficult to capture the full epidemiological burden of VBDs in these situations.

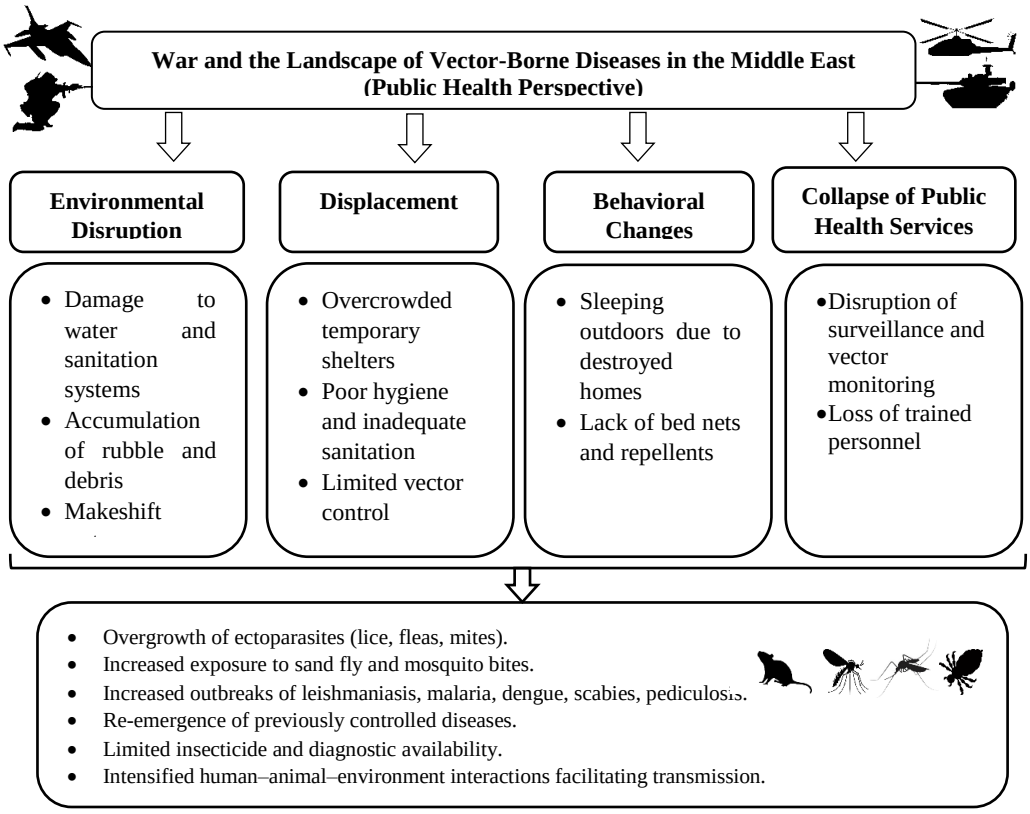

Fig. 1. Conceptual framework demonstrating how armed conflict affects key factors of vector-borne diseases in the World Health Organization Eastern Mediterranean Region, within the framework of operational challenges in public health. Icons sourced from Vecteezy.com (Free License)

http://jad.tums.ac.ir
Published Online: June 30, 2026

https://doi.org/10.18502/jad.v20i2.22412

Acknowledgements

During the preparation of this work, the authors used Grammarly AI to improve the readability and language. After using this tool/ service, the authors reviewed and edited the content as needed and take full responsibility for the publication's content.

Conflict of interest statement

The authors declare that there is no conflict of interest.

References

1. World Health Organization (2004) Integrated vector management: Strategic framework for the Eastern Mediterranean region 2004-2010. WHO Regional Officer for Eastern Mediterranean, Cairo.
2. Azari-Hamidian S, Harbach RE (2023) Arthropod-borne and arthropod-related viruses in Iran and neighboring countries. Parazitol. 57 (5): 356–440.
3. Topluoglu S, Taylan-Ozkan A, Alp E (2023) Impact of wars and natural disasters on emerging and re-emerging infectious diseases. Front Public Health. 11: 1215929.
4. Carew J, Simpson R, Pillay TD, Desai A, Toalster R, Parkes P, Abbara A (2025) Vector-borne diseases and the Syrian conflict: A systematic review of literature from Syria and neighbouring, refugee-hosting countries. PLOS Negl Trop Dis. 19(11): e0013721.
5. Spiegel P, Ratnayake R, Hellman N, Ververs M, Ngwa M, Wise PH, Lantagne D (2019) Responding to epidemics in large-scale humanitarian crises: a case study of the cholera response in Yemen, 2016–2018. BMJ Glob Health. 4: e001709.
6. Khoubdel M, Mehrabi TA, Vatandoust H, Abaei MR (2008) Arthropod borne diseases in imposed war during 1980-88. Iran J Arthropod-Borne Dis. 2(1): 28–36.
7. Danehkar A (2026) Editor's Note: Military Aggression and Iran's Environment. Journal of Natural Environment. 79(1): 1-4.
8. Dardona Z, Amane M, Boussaa S (2025) Scabies and Lice Infestations in Gaza: Risk Factors and Public Health Challenges During the 2023–2024 Conflict. Egypt J Dermatol Venerol. 45(2): 127–133.
9. Tarnas MC, Abbara A, Desa AN, Parker DM (2024) Ecological study measuring the association between conflict, environmental factors and annual global cutaneous and mucocutaneous leishmaniasis incidence (2005–2022). PLoS Negl Trop Dis. 18(9): e0012549.
10. De Luca P (2025) Gaza's collapsed health system requires urgent action from the global health community. East Mediterr Health J. 31(11): 657.
11. Moghadasi A, Ahmadi M, Dabbagh Moghaddam A (2025) The Impacts of War on Public Health with the Brief View on 12 Days War of Iran. J Med Counc Iran. 43(3): 23–38.
12. Moradi-Lakeh M, Majdzadeh R, Farzanegan MR, Naghavi M (2025) Iran and beyond: perilous threats to population health. The Lancet. 406(10507): 1001–1002.
13. Messenger LA, Furnival-Adams J, Chan K, Pelloquin B, Paris L, Rowland M (2023) Vector control for malaria prevention during humanitarian emergencies: a systematic review and meta-analysis. Lancet Glob Health. 11(4): e534–e545.
14. Chattu VK, Knight WA, Adisesh A, Yaya S, Reddy KS, Di Ruggiero E, Aginam O, Aslanyan G, Clarke M, Massoud MR, Jha A (2021) Politics of disease control in Africa and the critical role of global health diplomacy: A systematic review. Health Promot Perspect. 11(1): 20–31.