

Peripheral Cold Injuries in Displaced Persons: *A Scoping Review of the Pre-Hospital Evidence Base*

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Freezing Cold Injuries (FCI) a.k.a. Frostbite: damage sustained to tissues when exposed to temperatures below their freezing point (~-0.55°C) (1)
Non-freezing Cold Injuries (NFCI) a.k.a. Trench/Immersion foot: occurs after prolonged exposure to cold, non-freezing temperatures (0-15°C) plus wet conditions (2)



Displaced Person: Any persons forced to flee their homes, either within or across borders, in particular due to armed conflicts, generalised violence, violations of human rights or natural or human-made disasters (3)

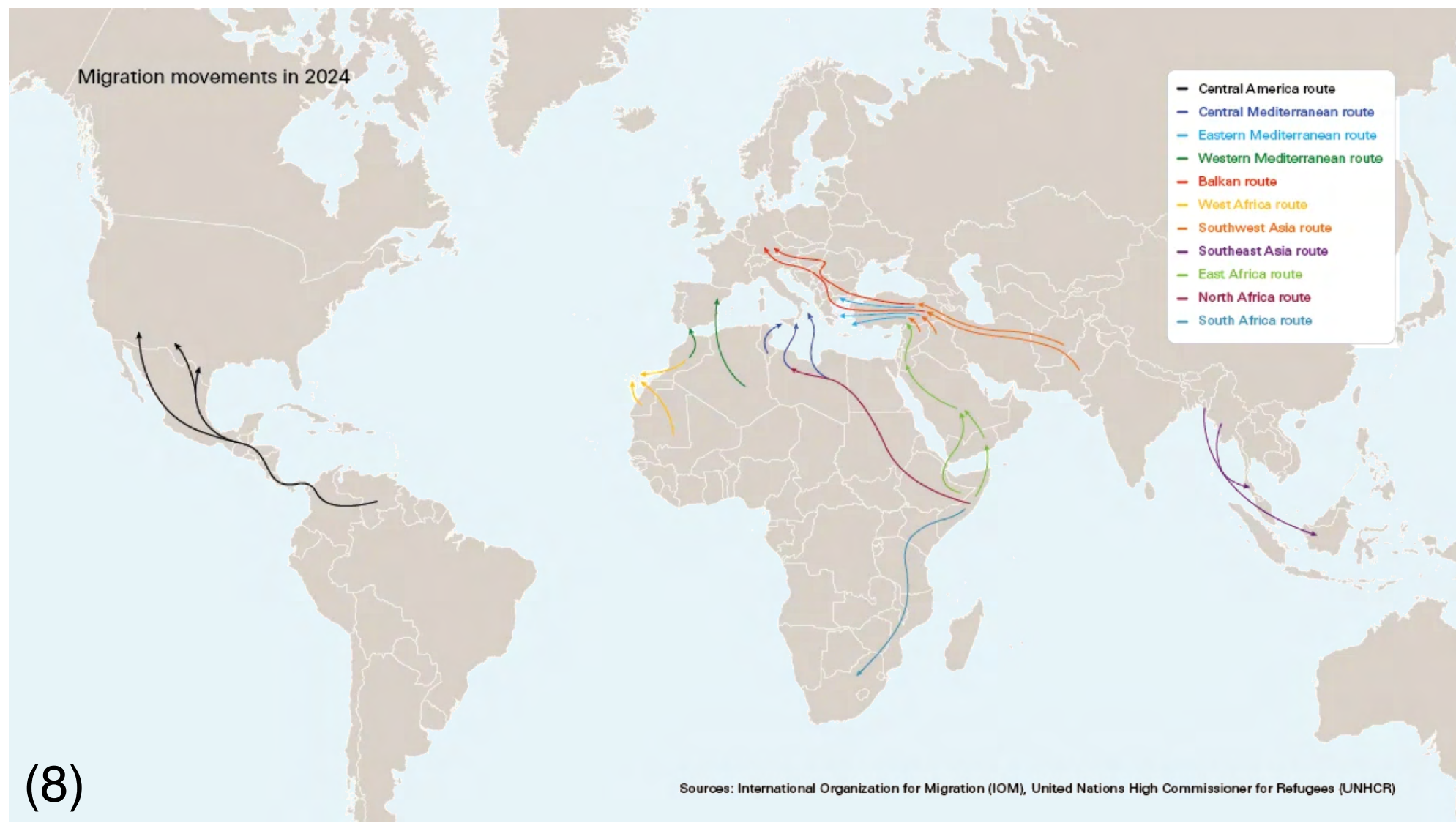
Introduction



136 million people projected to be forcibly displaced or stateless in 2026 (4)

Alongside surging global displacement numbers and an increasingly hostile legal and political climate towards migrants, the collapse of humanitarian infrastructure is reducing points of relative safety and resulting in inadequate access to healthcare, shelter and clothing (5).

Displaced people are taking longer and more dangerous migration routes, the majority involving sea or mountain crossings where conditions favour the development of cold injuries. Extreme weather makes these crossings more perilous, and pushbacks result in multiple attempts, putting people at risk of re-freezing injuries (6,7).



These factors combine to mean we are likely to see an increasing number of cases of cold injury among displaced people in the pre-hospital setting throughout the stages of migration (pre-departure, travel, interception, destination and return). It is important these are managed appropriately, as cold injuries carry significant long-term morbidity, including gangrene resulting in amputation, chronic pain, reduced sensation, arthritis, and bone deformities in children (9).

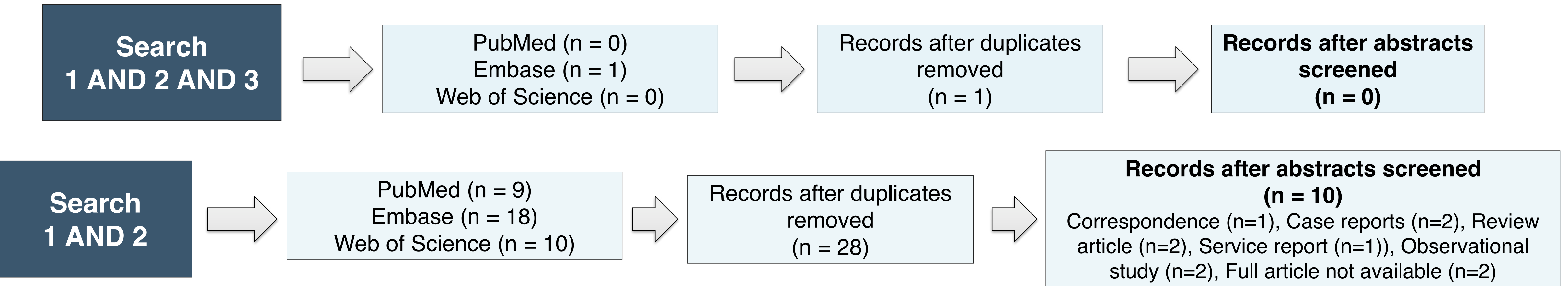
Aim: To scope the available evidence on peripheral cold injuries (FCI and NFCI) in forcibly displaced persons in the pre-hospital setting.

Key references

- (1) McIntosh S, Freer L, Grissom C, Rodway G, Giesbrecht G, McDevitt M, et al. Wilderness Medical Society Clinical Practice Guidelines for the Prevention and Treatment of Frostbite: 2024 Update. Wilderness Environ Med. 2024 Jun;35(2):183–97.
- (2) Zafren K, Hollis S, Weiss E, Danzl D, Wilburn J, Kimmel N, et al. Prevention and Treatment of Nonfreezing Cold Injuries and Warm Water Immersion Tissue Injuries: A Supplement to the Wilderness Medical Clinical Practice Guidelines. Wilderness Environ Med. 2023 Jun;34(2):172–81.
- (5) International Rescue Committee. 2026 Emergency Watchlist; New World Disorder. 2025 Dec
- (10) Lahi B, Hargan J, Zamatto F, Lim S. The consequence of border securitization: trench foot among migrants at the Bulgarian-Serbian frontier. The Lancet Regional Health - Europe. Elsevier Ltd; 2026. doi:10.1016/j.lanepe.2026.101615
- (13) Çelik S, Alpat SE, Bulut S, Koksall H. Frostbite – From Turkish Eastern Border As A Consequence Of Irregular Migration. Eastern Journal of Medicine. 2022;27(1):41–6. doi:10.5505/EJM.2022.48569

Method

Search Term	
1	refugee* OR asylum seeker* OR asylum-seeker* OR displaced person* OR internally displaced OR IDP OR IDPs OR migrant* OR undocumented migrant* OR stateless person* OR forcibly displaced person* OR "refugee camp*" OR "migrant camp*" OR "reception centre*" OR "reception center*" OR "informal settlement*" OR "transit camp*" OR "border camp*" OR "collective center*" OR "collective centre*" OR "transit center*" OR "transit centre*"
2	frostbite OR frostnip OR "cold injur*" OR "cold weather injur*" OR "non-freezing cold injur*" OR "nonfreezing cold injur*" OR NFCI OR "trench foot" OR "immersion foot" OR "freezing cold injur*" OR FCI
3	"prehospital" OR "pre-hospital" OR "Emergency Medical Services" OR "field setting*" OR "field condition*" OR "field hospital*" OR "austere environment*" OR "austere setting*" OR "resource-limited setting*" OR "resource-poor setting*" OR "low-resource setting*" OR "remote setting*" OR wilderness OR "expedition medicine" OR "disaster medicine" OR "humanitarian setting*" OR "humanitarian context*" OR "conflict setting*" OR "camp-based" OR "field clinic*" OR "mobile clinic"



Results

There were no articles looking at any aspect of peripheral cold injuries in displaced persons in the prehospital setting. When the search was not limited to the prehospital setting, 10 relevant articles were found:

- 1 correspondence: outlining 407 trench foot cases at MSF clinics, Bulgaria-Serbia border (2023-24). Key takeaways: abnormally high number of cases due to recent migration policy changes and closure of camps forcing migrants to take off-road routes through the mountains and walk longer distances before reaching temporary refuge. Those who sought care did not stay long for fear of pushbacks. MSF also saw cases in other locations with the commonalities between cases being walking long distances without refuge and limited access to healthcare and dry, appropriate clothing. (10)
- 2 case reports: specialised surgical techniques used in hospitals within Croatia and Türkiye (11, 12).
- 1 single centre, prospective observational study of 38 'irregular migrants' treated at a Research and Training hospital at the Eastern Border of Türkiye. Two patients absconded prior to completing treatment, again highlighting the fear of removal. No members of the local population presented due to frostbite – indicating displaced persons are especially vulnerable. Crucially, authors concluded that management of frostbite should begin in the prehospital setting to reduce risk of re-freezing and that early pre-hospital management and prompt diagnosis leads to better clinical outcomes (13).
- 2 review articles: the first looking at the health problems of new arrivals in Europe 2003-2016 (14) and the second focusing on skin diseases in displaced populations (15). Both refer to cold injuries being present within these populations and crucially highlight barriers to accessing healthcare and difficulties of delivering care in these populations e.g. level of access to medical care determined by legal status, cultural, language and structural barriers, lack of access to medications in the pre-hospital setting, and many hosted in lower-middle income setting where there is limited specialist capacity.
- 1 service report for a nurse-led TB clinic for homeless migrants in inner London highlights unstable legal status as a driver of homelessness which in turn led to drug and alcohol use as a coping mechanism, the combination of which leads to increased trench foot risk. Furthermore, lack of fixed abode restricting GP registration and leaving to an overreliance on Emergency Departments for care (16).
- 1 observational study (Nairobi informal settlements): increased years of life lost with cold weather, though cold injury not specifically examined (17).
- 2 articles inaccessible beyond abstract (conference abstract only; pay walled) (18,19).

Discussion

- Peripheral cold injuries are prevalent amongst displaced persons across a broad range of countries and settings;
- This review begins to draw out the factors driving that vulnerability, including walking long distances without refuge and limited access to healthcare and dry, appropriate clothing;
- A cross-cutting theme is lack of sustained healthcare access, and fear of pushback reducing patient willingness to remain in care to complete treatment;
- Prompt diagnosis and early pre-hospital management identified as vital for improving clinical outcomes – yet this review found no literature specifically addressing pre-hospital management in this population;
- Existing research into peripheral cold injuries has primarily been carried out on military populations (1,2,20) which have formed the basis for management guidelines;
- Displaced populations typically differ from military populations in key ways already shown to affect peripheral cold injuries risk including age, gender, ethnicity and presence of comorbidities such as diabetes, peripheral vascular disease, mental health conditions and drug and alcohol use (20,12);
- Access to medication and equipment in the pre-hospital setting, and time to access specialist care, may also differ significantly between these two populations.

Conclusion: Almost 1 in 60 people in the world are predicted to be displaced by the end of 2026. As outlined, this population is very vulnerable to developing peripheral cold injuries and have restricted access to healthcare. Given the risk of significant long-term morbidity, dedicated research into the recognition, triage, and pre-hospital management of cold injury in this population is urgently needed.

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