



Integrated analysis of social media and temperature data to define thermal sensitivity thresholds in urban environments in Abidjan (Côte d'Ivoire)



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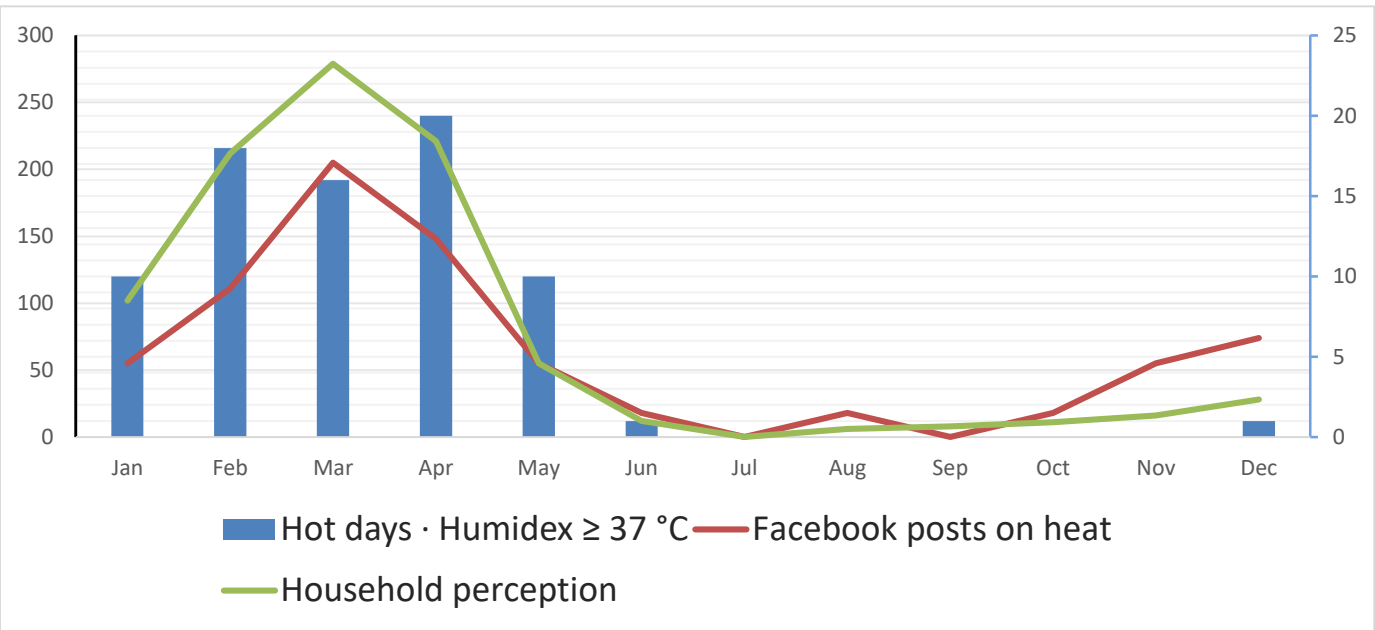
Background

West African cities are warming faster than their populations can adapt, yet **conventional meteorological monitoring measures temperature without capturing how residents perceive and respond to heat**. Social media generate real-time, citizen-sourced signals of thermal discomfort that can complement instrumental climate data.

Aim. Triangulate Facebook discourse, meteorological records and household surveys to derive perceived-heat thresholds for an urban heat–health early-warning system (EWS) in Abidjan.

Results

Three signals, one heat pattern — Abidjan, 2022–2024
Bars: hot days (Humidex ≥ 37 °C) · Red line: Facebook posts on heat · Green line: household perception



All three signals peak together in March–May. Facebook discourse on heat rises and falls in lockstep with measured hot days and household-reported discomfort — co-variation that validates social media as a complementary heat-surveillance signal in data-scarce settings.

Methods

1

Data Collection
Facebook scraping + meteorological records

2

Data Cleaning
Deduplication + Abidjan geo-filtering → 757 heat-relevant posts

3

Correlation
Posts × Humidex ≥ 37 °C × household perception

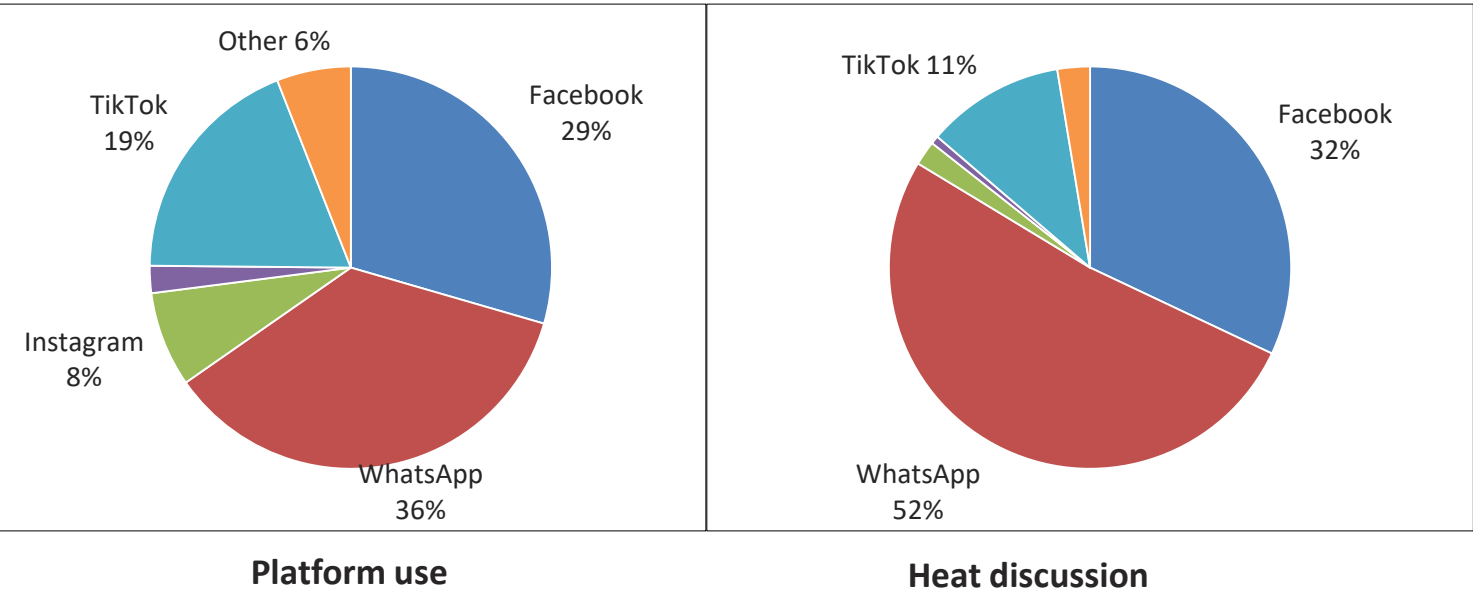
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Threshold
Percentile alerts P75 → P99 (felt temperature)

Four-tier heat-index thresholds (felt temperature)

Vigilance	37.2 °C	P75
Alert	38.5 °C	P90
Enhanced alert	39.2 °C	P95
Emergency	39.9 °C	P99

Platform selection



Why Facebook? WhatsApp dominates everyday use (52%) and heat exchanges (36%), but its closed architecture blocks research extraction. **Facebook** (29% use; **32% of heat discussion**) is the only platform open to systematic public-API harvesting — making it the workable proxy for heat discourse in Abidjan.

Facebook Data Extraction & Processing

- 66,000 → 44,000: duplicate-post removal
- 44,000 → 3,000: exclusion of non-Abidjan posts
- 3,000 → 757: semantic filtering for heat relevance

Conclusion

Validated. Facebook heat discourse co-varies with measured hot days and household-reported discomfort, supporting social media as a complementary signal for heat surveillance in data-scarce settings.

Deployed. First operational test of the heat–health EWS launched in Williamsville (Abidjan), with the EWS coordination committee convened in 2024.

Next. Extend to other Abidjan communes and integrate near-real-time Facebook ingestion into the alert pipeline.

Take-home. Crowd-sourced heat discourse tracks measured heat and citizen perception, enabling a four-tier EWS with operational alert at 38.5 °C.

Limitations. Facebook users skew young and urban; thresholds are city-specific and require recalibration for other West African cities; Humidex proxies felt temperature (WBGT preferable for occupational exposure); validation is retrospective — prospective health-outcome data needed.

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