

Extreme heat and air quality in Ghanaian hospitals



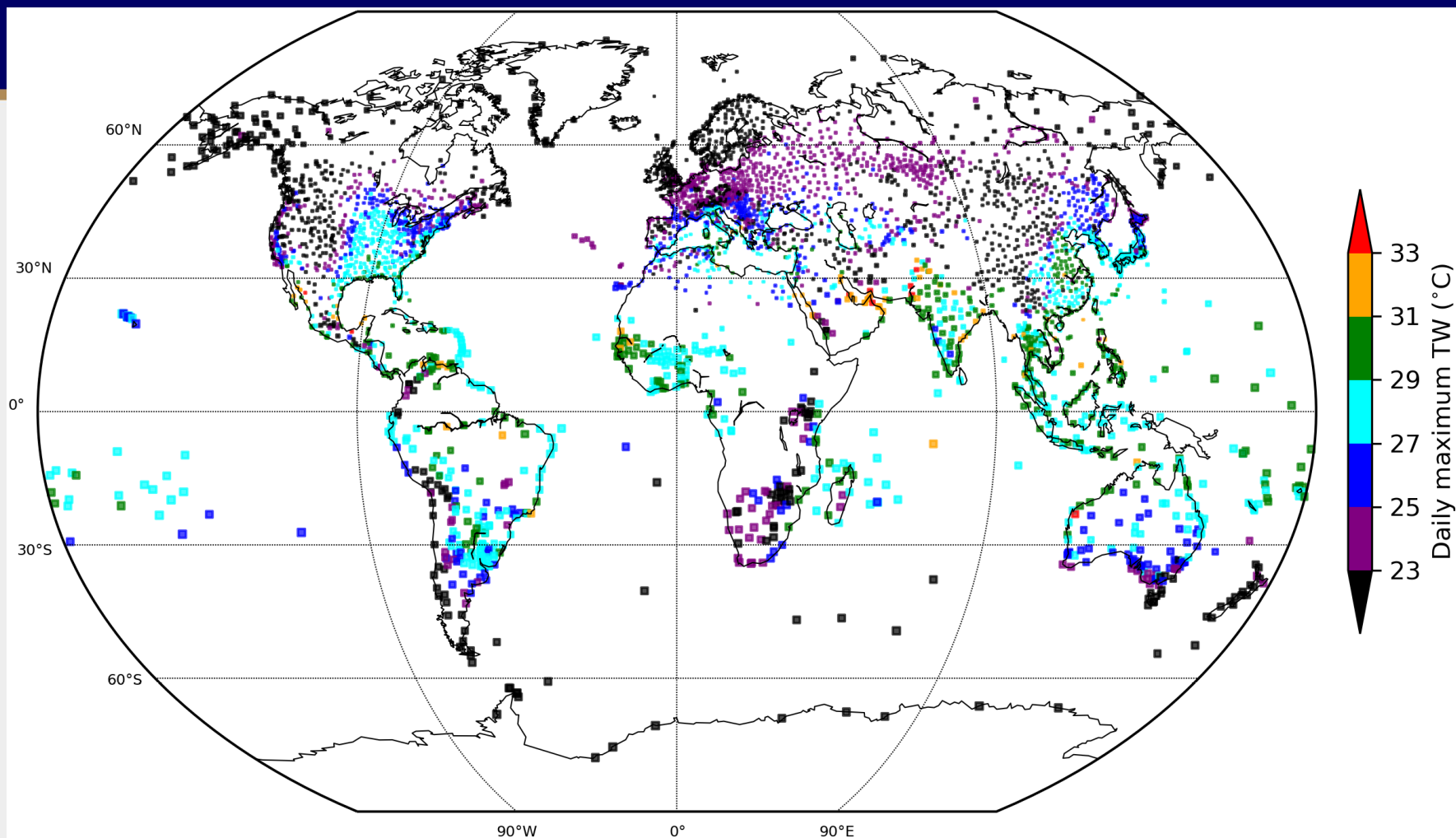
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UNIVERSITY OF GHANA

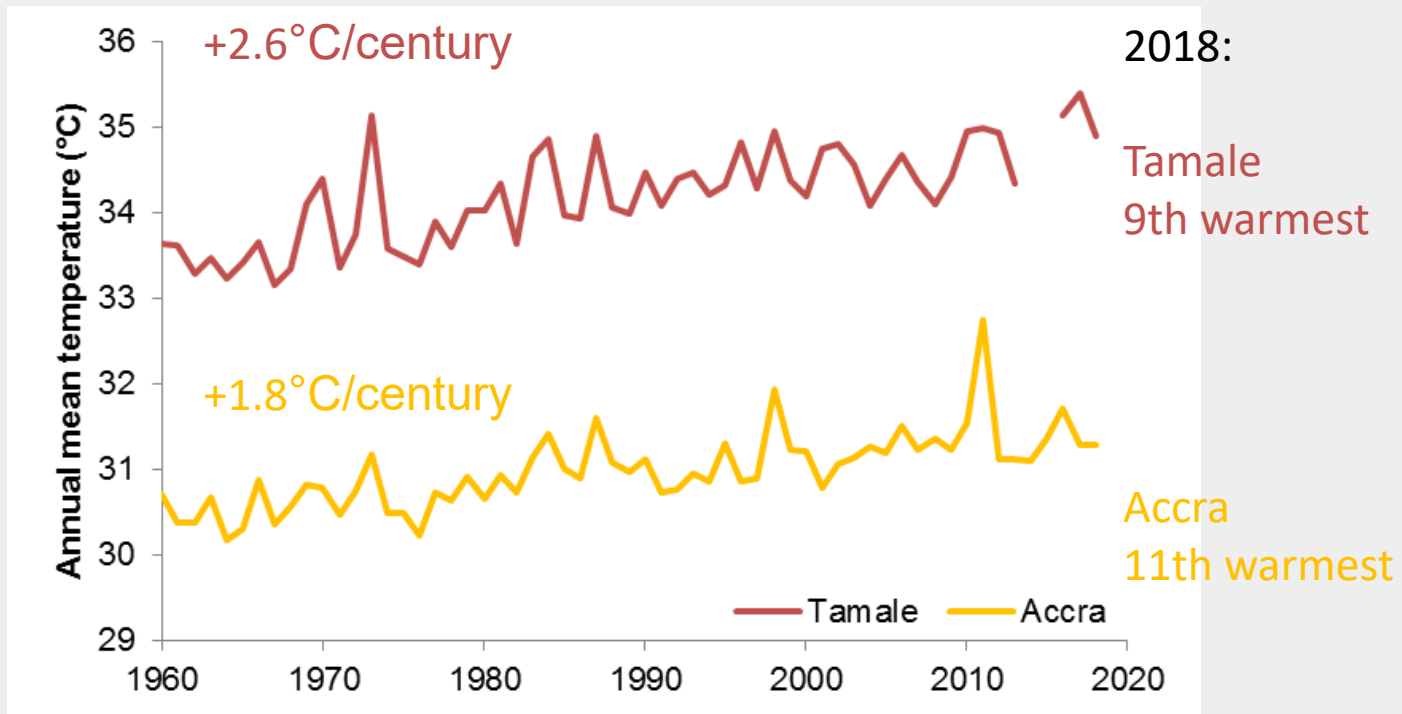
Global 'hotspots' (outdoor)



Observed OUTDOOR global extreme humid heat. Colour symbols show the 99.9th percentile of observed daily maximum wet-bulb temperature for 1979–2017 for HadISD stations with at least 50% data availability. Human heat stress, health and labour impacts occur when $TW > 26^{\circ}\text{C}$. Source: Raymond et al. (2020)



Rising temperatures in Ghana



Annual mean temperatures measured at airports of Tamale and Accra since 1960



Extreme high temperatures in workplaces and health facilities



Food preparation 48.1°C

Living/sleeping room 45.5°C



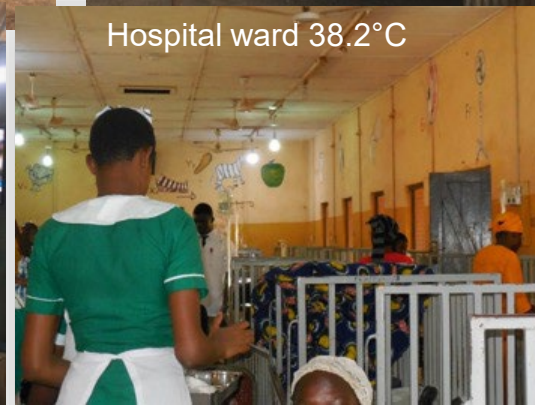
Seamstress 50.3°C



Blacksmith 61.0°C



Cinema 38.7°C



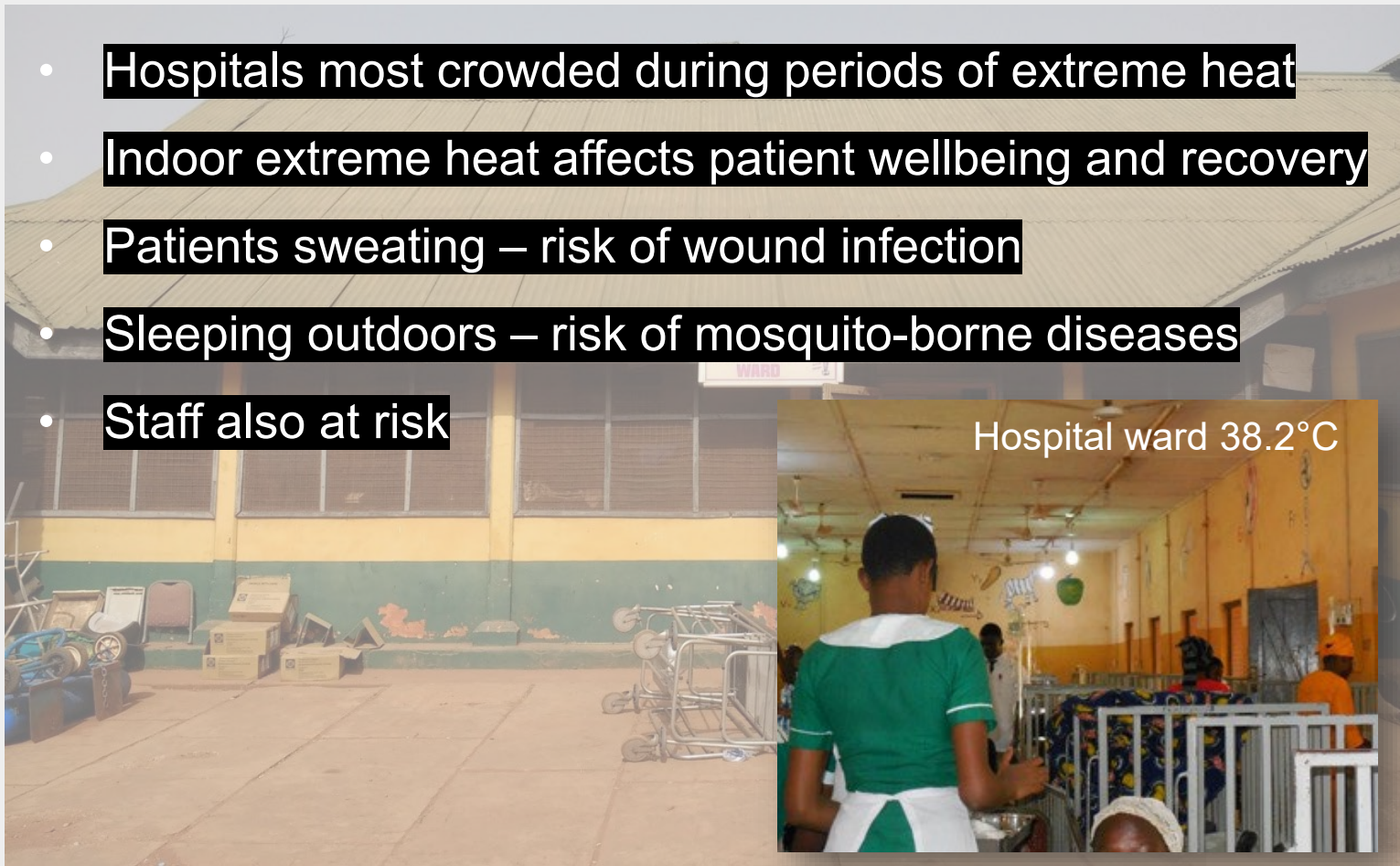
Hospital ward 38.2°C



VEWEC

Impact of heat on health

- Hospitals most crowded during periods of extreme heat
- Indoor extreme heat affects patient wellbeing and recovery
- Patients sweating – risk of wound infection
- Sleeping outdoors – risk of mosquito-borne diseases
- Staff also at risk



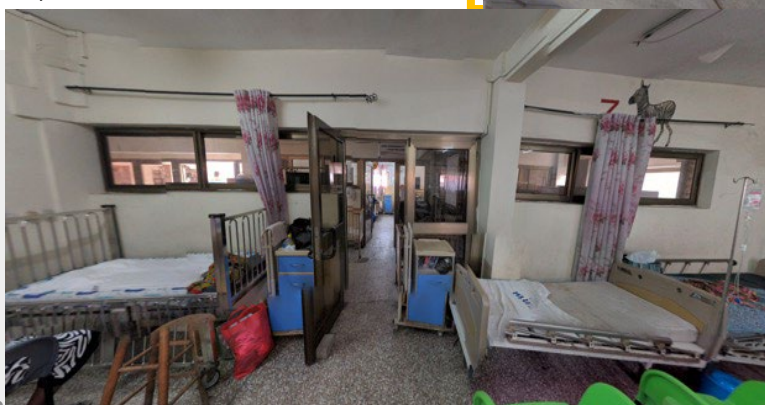
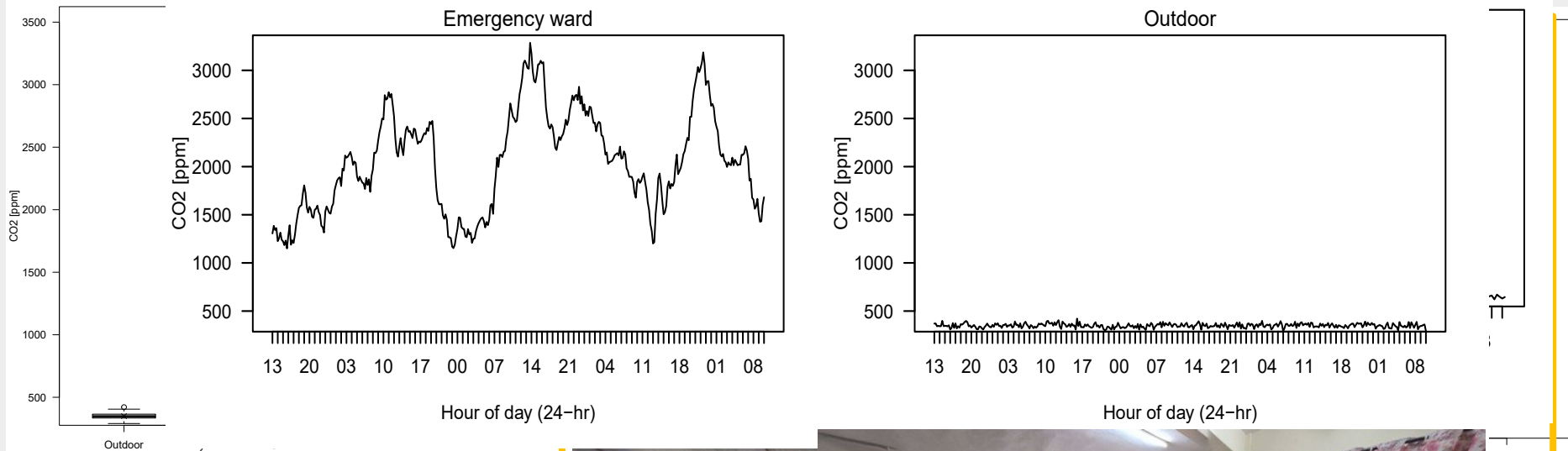
REFIT

Building resilient hospitals?



17/11/2024

Comparing indoor air temperatures



Comparing indoor air temperatures

- Indoor air quality satisfactory in most wards (<950 ppm)
- Air-conditioned wards (re-circulating) poor IAQ (unless the windows are opened)
- Thermal comfort and mosquito concerns mean windows are closed in the rainy season

How effective are building adaptations at reducing indoor temperatures?



Reflections

- Heat and health policy interface
 - Building, energy and behavior adaptations - cross-sectorial solutions
 - Climate resilient buildings, thermal comfort, air quality
- Next steps: Grants and PhD opportunities
 - Heat and disease burdens; community-level burden



LOW/ZERO ENERGY
COOLING



DILUTION OF
AIRBORNE VIRUSES



PREVENTION OF MOSQUITO-BORNE
DISEASE

The multi-dimensional adaptation problem requires cross-sectoral solutions