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Background

Climate change has an early and strong impact on vulnerable sub-Saharan regions. However, data of these regions to power climate change and health research remains scarce. Wearable devices may provide new opportunities to conduct reliable research given their advantage to continuously capture data in real-life settings of individuals, even in low-resource contexts. This approach can be used to gain insights regarding the effectiveness of interventions.

Objective

Are wearables for climate change and health research in cohorts in the Siaya region, Kenya (K) and Nouna region, Burkina Faso (BF) feasible and accepted?



Figure 1. Participant in K receiving the wearable

"Nothing can stop me from participating"

"It helps me control my health"

"Is it dangerous to wear?"

(participants in K, BF)

Methodology



N=231 participants
 (50% female, age 6-84)
 over **3 weeks** each



Withings Pulse HR (heart rate, activity/steps, sleep),
Tucky Thermometer (body-shell temperature)



Continuous evaluation:
questionnaire
 (every 4-7 days)



10 state-of the art weather stations

Results

Acceptability questions had an overall agreement of 97%/93% (BF/K). Participants emphasized the practicability of the watch function (K) of the wearable, at times even perceived the wearable as fashionable (BF, K) and stated that others showed great interest in the wearables (K). 40.5% of participants (BF) were afraid of accidentally damaging the wearable. Data completeness of heart rate and temperature measurements was considerably lower than of accelerometry (steps, sleep). Encountered difficulties were malfunctioning synchronization and use of the adhesive wearable (BF: lack of adhesion, K: tape too sticky/painful).

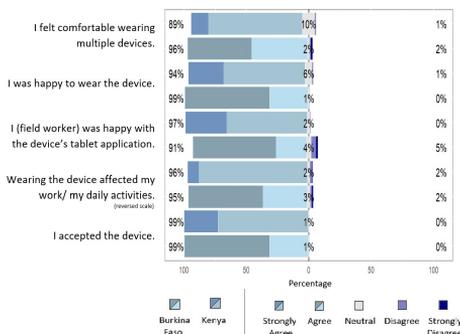


Figure 2. Answers of the acceptability questionnaire

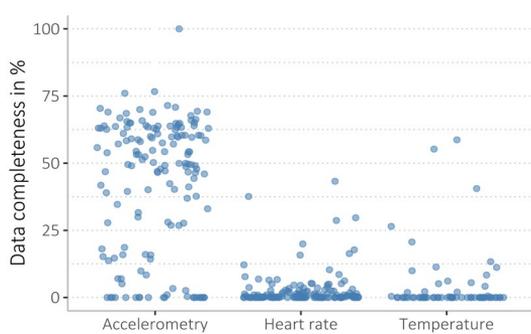


Figure 3. Data completeness

Conclusions

Based on our results, wearables were an accepted, feasible and valuable method to generate health insights in low-resource contexts and to potentially investigate individuals' exposures and direct health effects of climate change-related environmental conditions.

Recommendations

We have found that data completeness was higher when there were regular visits of field workers to study participants. More focused research is needed to increase data quality and implement research standards.