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HEALTH EFFECTS INSTITUTE AIR QUALITY WEBINAR SERIES SEPT-DEC 2023

Webinar 1:

Building momentum for health studies using locally available air quality and health data Date & Time Sep 19, 2023 08:00 AM Eastern Time (US and Canada) 814 8043 9343 Webinar ID



Talk 2: 4.15-4.30pm

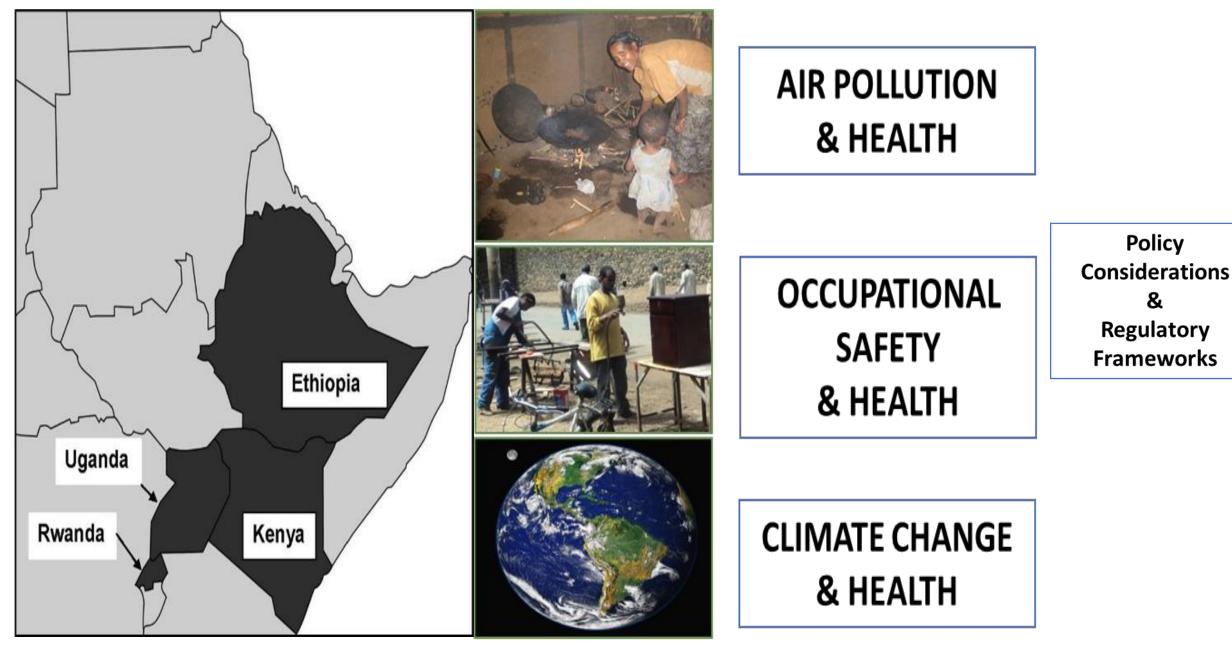
Showcase of ongoing or completed AQ and health research, opportunities & challenges Augustine Afullo, Eastern Africa GEOHealth Hub (Kenya)

BAM and E-sampler, Quar





The GEOHealth Cycle 1 2016-2021



Health and exposure assessment

• Exposure Assessment: BAM-1022 central site monitor (GOLD STANDARD MONITOR) · Health Effects Assessment: Morbidity and Capital city population mortality data from 10 hospitals Time: Continuous Poisson time-series modeling 1000 children from • Exposure Assessment: School site e-samplers Health Effects Assessment: Health questionnaire, lung 10 schools function tests (spirometry) • Time: 1 year • **Exposure Assessment:** PATS+ co-located with UPAS in homes with MA2000 for black carbon monitoring and home characteristic survey 30% of children's homes Health Effects Assessment: Health questionnaire, lung function tests (spirometry) • Time: 3 days

<u>GEOHealtH-UoN-</u> Data collection duration

- a. The monitors include BAM 1022 that ran for 3 years then RECENTLY stopped due to PUMP failure (In process of being procured)
- b. The E-Samplers are (Low cost sensors) currently five and have been running for the last four years.
- c. They are at Moi Avenue, Riruta satellite, St Bakhita, Heshima road and James Gichuru pri schools
- ► 3 year uninterrupted data from BAM 1022
- The annual mean PM_{2.5} levels over 3 years (2019-2022) were higher (18.9 ±0.6 µg/m³)
- Dry and wet season PM2.5 levels vary btn 14 and 19 µg/m³
- E-Sampler reading varied from 10- 35 µg/m³; Karen C -James Gichuru

Spirometry- Lung Function Test and Hospitalisation / mortality/ Morbidity Spirometry done in 10 schools;

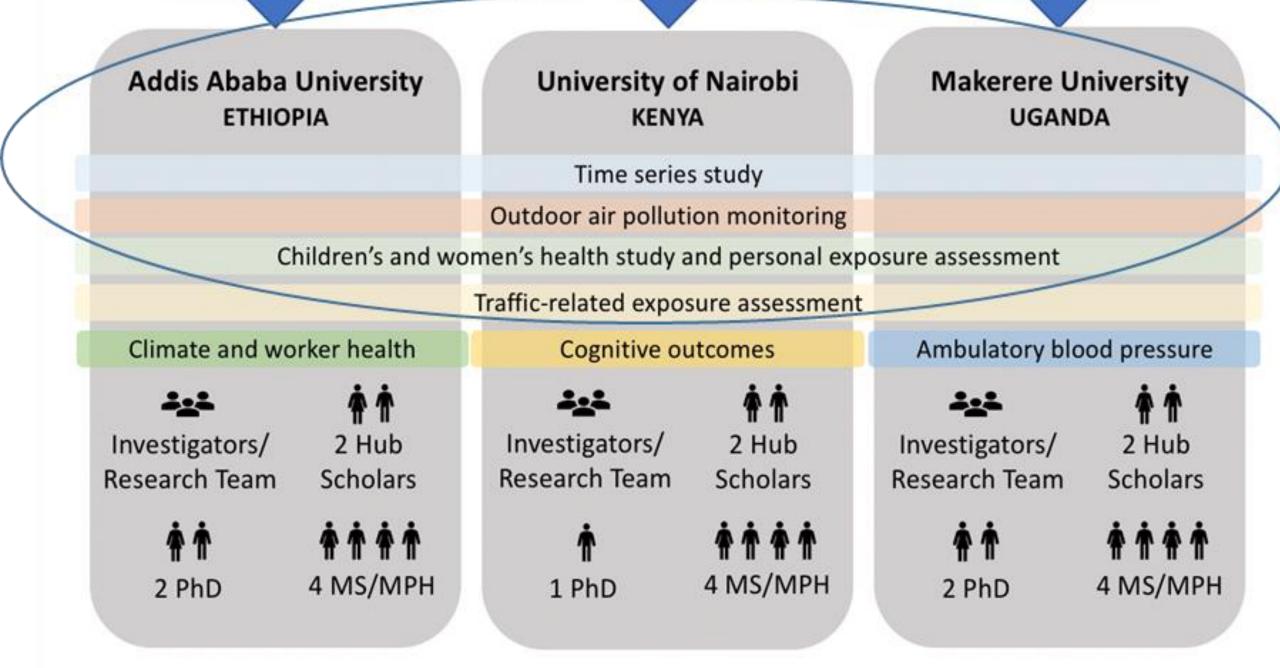
- A total of 1080 children grade 5-6 aged 12-13 years done lung function test;
- 10% of the children had 75% impaired lung function with half having acutely impaired lung function;
- Lung / heart related hospitalization highest among <15 yrolds and those aged 45-54;
- Mortality is highest among those aged 85+ years at 3-7.4% (heart) and 2.5-3.03% (pulmonary) mortality.

CYCLE II- 2022-2027: AT SETUP PHASE

- Environmental health studies:
 - Lung function [ALL]
 - Blood pressure [Uganda]
 - Cognitive development [Kenya]
- Occupational heat stress [Ethiopia]

Time series-Hospital-based morbidity and mortality [ALL]

Research training program domains and competencies



- AirQo Co-location / partnership and Quantag The AirQo sensors have 21 weeks data. They are located in Nairobi Pri., Karen C, Embakasi, Baba Dogo and at UoN Parklands. The AirQo sensors were taken to the schools that initially had E-Samplers but broke down. ▶ 11 QuantAq sensors are currently collocated at **UoN Parklands campus.**
- They have been running for 10 weeks.

HEALTH FACILITIES DATA-CAUSE RELATED MORTALITY AND MORBIDITY

- The health facilities include: Mbagathi, Aga Khan, Nairobi hospital, Mama Lucy, Marter hospitals.
- ► We have 46 months of data from these facilities.
- We had some challenges with Nairobi hospital but it's now picking up.
- Has been a cycle I activity; Continues in Cycle 2

MoU on data sharing Protocols

- Partnership opportunities exist
- We have signed MoU with various partners and shared data with them.
- Some of them include; NEMA, SEI, a PhD student from UoN
- Feam got an opportunity to showcase their work during the upcoming agricultural show
- It's possible to get real time data from the Airqo and Quantaq sensors.
- >One just requires an internet.
- >However, BAM data requires manual download.

GAPS / AREAS FOR FURTHER PARTNERSHIP?

- Getting spare parts for the sensors is a challenge.
- We have to ship them from US
- Hence losing a lot of data in the process.
- A local manufacturer To consider venturing into this?

Co-location Partnership

- We are making al attempts to bring the BAM back to life;
- We are open for colocation with BAM, being a gold standard sensor

Societal Benefits from GEOHealth Data so far

- Stakeholder workshop @UoN: 24th Jan, 2022: Awareness about risky parts of the city- schools, hospitals, NEMA, NBI county dept health; etc---- Link: (910) GEOHEALTH STAKEHOLDER ENGAGEMENT: Air Pollution in the City of Nairobi-Bridging Evidence with Policy YouTube
- Policy brief 1 of 2022:



Policy Brief 2 of 2023:

ACKNOWLEDGEMENT

- Prof Nicholas Oguge, GEOHealth PI, Kenya
- Prof S A Obiero- CO-I (Kenya)
- Lydia Okola- Program Administrator (Kenya)
- Joshua N; Noah A; and Beldine A- Research / Field Assistants
- NIH- USA Funding Agency (and IDRC Cycle 1 partial funder)
- Prof Kiros Berhane- University of Columbia- Regional Geohealth PI (USA)
- Prof Abera Kumie-Reginal Geohealth PI (Addis Ababa Univ)