



Makerere University
College of Health Sciences
SCHOOL OF PUBLIC HEALTH

**Strengthening capacity to promote East Africa-led research programs on
air quality and health Webinar**

Capacity needs for converting research into practice: A Case for the Eastern Africa GEOHealth HUB

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Date: 25th October 2023



Makerere University, East Africa



Capacity needs for converting research into practice

- There is a big gap in converting research evidence into practice, especially for the LIC
 - Limited funding for projects, programs, and innovations
 - Training institutions and higher education
 - Innovators and manufacturing
 - Investing in instrumentations
 - Limited evidence and publications for decision-makers to take action
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Capacity needs for converting research into practice

- Examples of Makerere University training initiatives
 - Training programs
 - Bachelor of Environmental Health Sciences
 - Master of Environmental and Occupational Health
 - Other relevant PG courses (MPH, MBIO etc.)
 - Makerere University Lung Institute
 - Small grants program for young faculty and postgraduate trainees
 - Government agencies and departments active
 - MoWE, MoH, NEMA
 - Policy Makers Parliament and Local Government are more active but we need more advocates
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Capacity needs for converting research into practice

- Major Challenge:
 - Laboratory, Equipment and Supplies
 - Scientists and instrumentation
- Illustration with the GEOHealth Hub



The Eastern Africa GEOHealth

- Higher Education Institutions important in fostering partnerships
 - They promote the exchange of knowledge, research, and innovations, and equip students with the skills needed
 - The Eastern Africa GEOHealth HUB is a partnership in Africa and North America, 10 years so far
 - Project focus: Indoor and outdoor air pollution effects on:
 - Lung function [ALL countries]
 - Blood pressure [Uganda]
 - Cognitive development [Kenya]
 - Hospital-based morbidity and mortality (time series) [ALL countries]
 - Climate/occupational heat stress [Ethiopia]
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Partner Institutions

- Africa
 - Makerere University - Uganda
 - University of Nairobi - Kenya
 - Addis Ababa University - Ethiopia
 - The University of Rwanda - Rwanda
- North America
 - Columbia University
 - University of Southern California
 - Colorado School of Public Health University
 - Colorado State University



Beta Attenuation Monitor (BAM-1022) at Makerere University School of Public Health-Central Site Monitoring



Practices for capacity building research

- Exchange visits
- For training – Co-PIs training in USC
- Study tours for best practices





Top left NIEHS
Top: USC
Left: Harvard SPH,
Right: Training BEH



Sustainability of research and relationships

- Student involvement
 - Student field attachment during recess term
 - Rotations during university training in AP Climate Change
 - Small student grants for competition
 - Visibility and networking with professional communities
 - Publications and co-authorship
 - Scientific conferences e.g. International Society for Environmental Epidemiology (ISEE)
 - International Society of Exposure Science (ISES)
 - WHO, Air Pollution Technical working group
 - MakCoCIS AirQO
 - Makerere University Lung Institute (MLI) refer patients during research
 - Opportunities for collaboration e.g. US Embassy, Health Effects Institute, KCCA, **saMRC**
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Visibility and networking at the WHO



Partnership management and strengthening

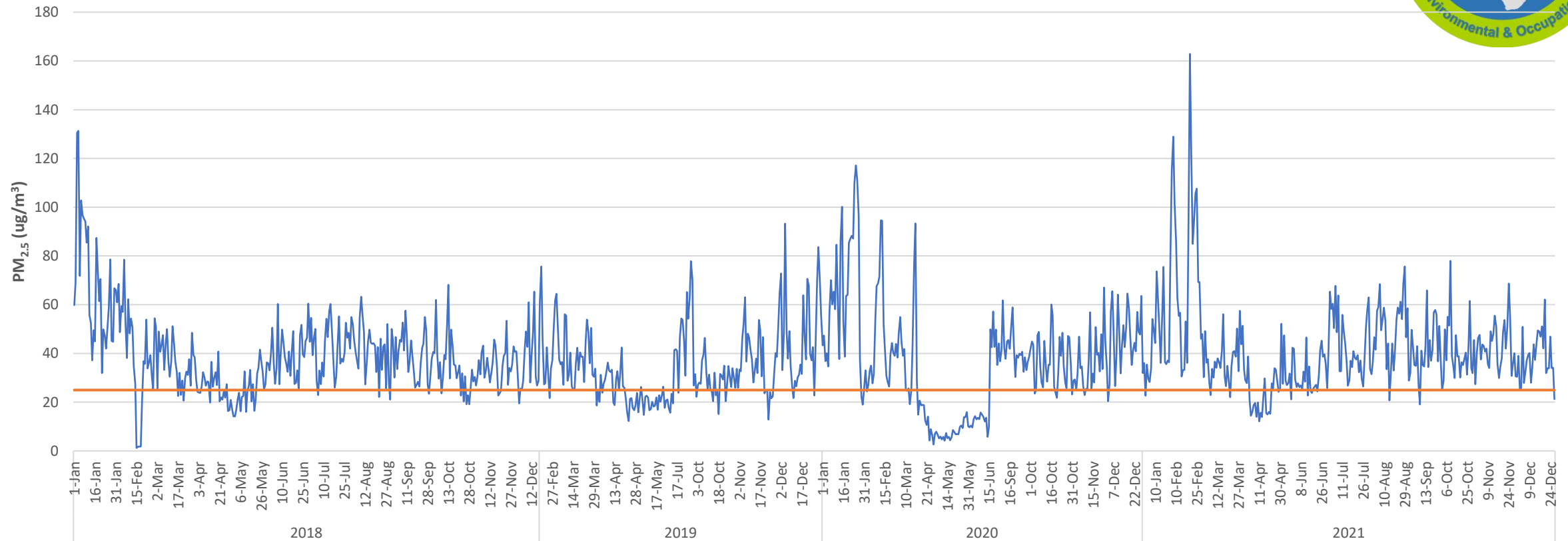
- Partnerships
 - Academic Institutions
 - Stakeholders and implementors of results (KCCA, MoH, MoWE, NEMA, HEI)
 - Exchange visits and Training



Engage community and provide evidence

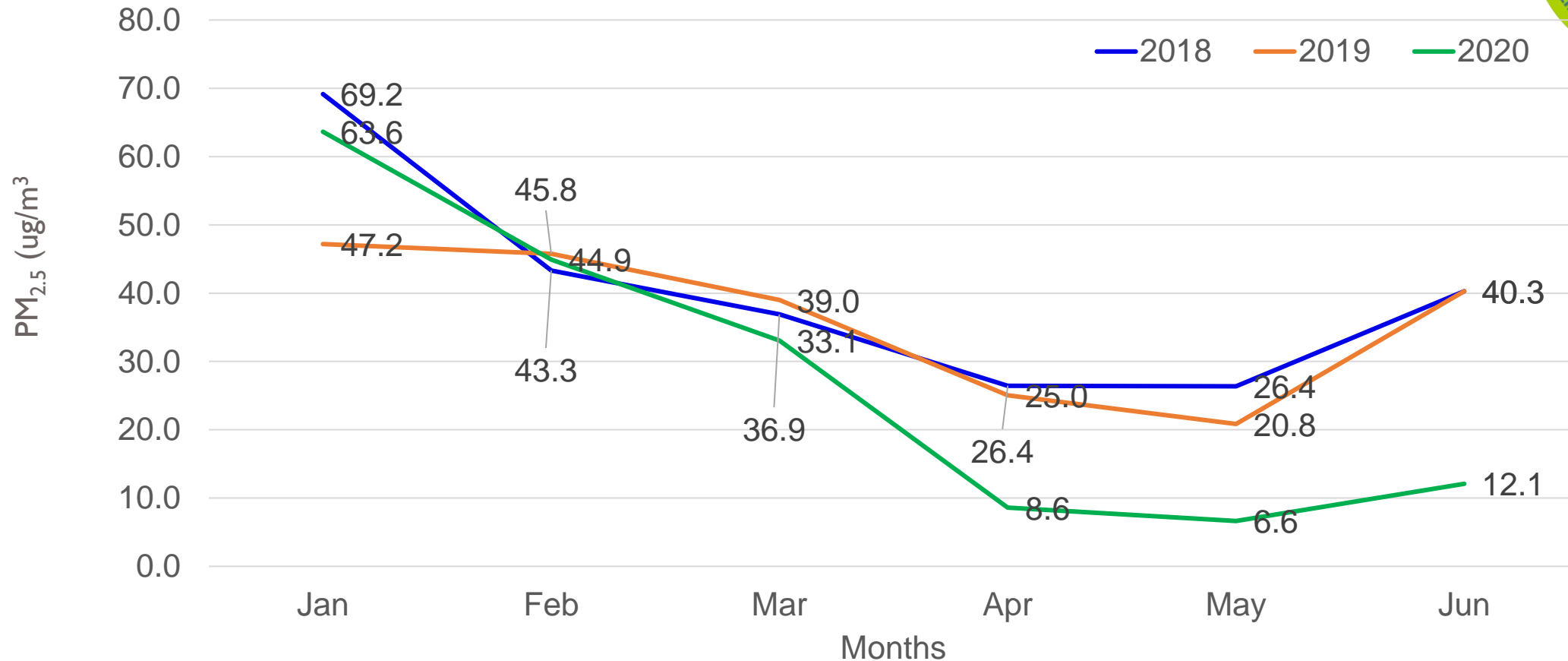


Results: Time series patterns of PM_{2.5} based on BAMs 1022 at MakSPH, 2018-2021



- Overall, annual PM_{2.5} for 4 yrs (2018-2021) was **39 $\mu\text{g}/\text{m}^3$** , with December, January, and February standing out with the highest concentration above **80 $\mu\text{g}/\text{m}^3$** ,
- PM_{2.5} concentrations are highest in the morning (09.00hrs) and in the evening (21.00 hrs)

Monthly average PM_{2.5} concentrations, January to June 2018, 2019, 2020, Kampala Uganda



During the COVID-19 complete lock-down period, PM_{2.5} was in the acceptable range

The Health Impact of AP in Kampala



- In 2020, 1,281 (17.9%) death could be attributable to long-term exposure to air pollution (exposure to $PM_{2.5}$ concentrations above the WHO annual mean of $5\mu g/m^3$)
- In 2021, 1,063 (19.8%) deaths could be attributable to long-term exposure to air pollution (exposure to $PM_{2.5}$ concentrations above the WHO annual mean of $5\mu g/m^3$).
 - This is derived from the WHO expected annual mean for healthy air to breathe ($PM_{2.5}$ concentration of $5\mu g/m^3$).
- **Conclusion:**
 - Opportunities for converting evidence into practice though limited could be enhanced