

Curriculum Vitae

Raphael E Arku

University of Massachusetts Amherst
School of Public Health and Health Sciences
Department of Environmental Health Sciences
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EDUCATION

- 2015 **Harvard School of Public Health** | Boston, MA
Doctor of Science in Environmental Health
Department of Environmental Health | Concentration in Exposure, Epidemiology, and Risk
Major: Environmental exposure assessment; Minors: Biostatistics; Spatial methods
Dissertation title: Poverty, energy use, air pollution and health in Ghana: a spatial analysis
Committee: Majid Ezzati (Chair), Marcia C Castro, John D Spengler, James H Ware
- 2009 **Cyprus International Institute for the Environment and Public Health** in association with
Harvard School of Public Health | Nicosia
Master of Science in Environmental Health
- 2007 **University of Ghana** | Legon, Accra
Master of Philosophy in Geography
Department of Geography and Resource Development
Thesis title: Assessment of air pollution exposure: spatial and temporal variations in low-income neighborhoods of Accra
- 2003 Bachelor of Science in Geology
Department of Earth Science

PROFESSIONAL EXPERIENCE

- 2018- **Assistant Professor**, Department of Environmental Health Sciences, School of Public Health and Health Sciences, University of Massachusetts Amherst
- 2015-2017 **Post-Doctoral Fellow**, Occupational and Environmental Health Division, School of Population and Public Health, University of British Columbia
Research title: Global assessment of air pollution and cardiovascular and respiratory diseases in low- and middle-income countries within the Prospective Urban and Rural Epidemiological Study (PURE)

FELLOWSHIPS & FUNDING

Active

- 2020- Walter A. Rosenblith New Investigator Award
Project Title: Urban air pollution in sub-Saharan Africa: A study of prenatal exposures, birth outcomes, and lower-respiratory infections in infants
Role: PI
- 2019- National Geographic Society
Project Title: Making case for reducing air and noise pollution in school environments in Accra, Ghana
Role: PI
- 2019- Wellcome Trust: Our Planet, our Health Award
Project Title: Pathways to Equitable Healthy Cities Consortium (lead: Imperial College London)
Role: Co-PI (sub-Contract)

2018- **Fellow**, JPB Environmental Health Fellows Program, Harvard T.H. Chan School of Public Health
 Project Title: Environmental exposures in the home environment and COPD exacerbation
 Role: PI

Completed

2015-2017 **Fellow**, Michael Smith Foundation for Health Research (MSFHR), Post-Doctoral Research Trainee Award (Award #: 16280), University of British Columbia
 Project Title: Global epidemiologic study of air pollution exposures and cardiovascular and respiratory disease in the Prospective Urban and Rural Epidemiological Study
 Role: Trainee

2013-2014 University of Ghana Research, Innovation and Development Grant, University of Ghana

2010-2015 **Fellow**, President's scholarship, Harvard School of Public Health

2010-2015 **Fellow**, Thorley Briggs Fellow and Mitchel Don Fellow, Harvard School of Public Health

PROFESSIONAL ACTIVITIES

2007- Member, International Society for Environmental Epidemiology

2010- Member, International Society of Exposure Science

PUBLICATIONS

Refereed research and review articles

* Equal contributions

24. NCD Risk Factor Collaboration (NCD-RisC). Height and body-mass index trajectories of school-aged children and adolescents from 1985 to 2019 in 200 countries and territories: a pooled analysis of 2181 population-based studies with 65 million participants. *Lancet* 2020; 396: 1511-14
23. Rosenthal J, Arku RE, Baumgartner J, Brown J, Clasen T, Eisenberg JN, Hovmand P, Jagger P, Luke DA, Quinn A, Yadama GN. Systems science approaches for global environmental health research: enhancing intervention design and implementation for Household Air Pollution (HAP) and Water, Sanitation and Hygiene (WASH) programs. *Environmental Health Perspectives* 2020; doi.org/DOI 10.1289/EHP7010
22. Arku RE, Brauer M, Duong M, Wei L, Hu B, TSE LA, Mony PK, Lakshmi PVM, Pillai RK, Mohan V, Yeates K, Kruger L, Rangarajan, Koon T, Yusuf S, Hystad H, PURE team. Adverse health impacts of cooking with kerosene: A multi-country analysis within the Prospective Urban and Rural Epidemiology Study. *Environmental Research* 2020; doi.org/10.1016/j.envres.2020.109851
21. Clark SN, Alli AS, Brauer M, Ezzati M, Baumgartner J, Toledano M, Hughes AF, Moses J, Terkperterey S, Nimo J, Vallarino J, Agyei-Mensah S, Agyemang S, Muller E, Nathvani R, Wang J, Beddows A, Kelly F, Barratt B, Arku RE. High-resolution spatiotemporal measurement of air and environmental noise pollution in Sub-Saharan African cities: Pathways to Equitable Health Cities Study protocol for Accra, Ghana. *BMJ Open* 2020;10:e035798. Doi.org/10.1136/bmjopen-2019-035798
20. NCD Risk Factor Collaboration (NCD-RisC). Repositioning of the global epicentre of non-optimal cholesterol. *Nature* 2020; 582: 73-77
19. Nazif-Muñoz IJ, Spengler J, Arku RE, Oulhote Y. Solid fuel use and early child development disparities in Ghana: analyses by gender and urbanity. *Journal of Exposure Science and Environmental Epidemiology* 2020. doi.org/10.1038/s41370-020-0224-4
18. Arku RE, Brauer M, Ahmed SH, Alhabib KF, Avezum A, Bo J, Choudhury T, Dans MAL, Gupta R, Iqbal R, Noorhassim I, Kelishadi R, Khatib R, Koon T, Kumar R, Lanas F, Lear S, Li W, Lopez-Jaramillo P, Mohan V, Poirier P, Puoane T, Rangarajan S, Rosengren R, Soman B, Caklili OT, Yin L, Yeates K, Yusoff K, Zatoński T, Yusuf S, Hystad P, and the PURE team. Outdoor and household air pollution exposure and blood pressure in the Prospective Urban and Rural Epidemiological (PURE) Study. *Environmental Pollution* 2020; 262:114197
17. NCD Risk Factor Collaboration (NCD-RisC). Rising rural body-mass index is the main driver of the global obesity epidemic in adults. *Nature* 2019; 569(7755): 260-264
16. Hystad P, Duong M, Brauer M, Larkin A, Arku RE, Om P, Kurmi O, Fan WQ, Avezum A, Azam I, Chifamba J, Dans A, du Plessis JL, Gupta R, Kumar R, Lanas F, Liu Z, Lu Y, Lopez-Jaramillo L, Mony P, Mohan V, Mohan D, Nair S, Puoane T, Rahman O, Tse Lap A, Wang Y, Wei L, Yeates K, Rangarajan S, Teo K, Yusuf S, and the PURE team. Health Effects of Household Solid Fuel Use: Findings from 11 Countries within the

- Prospective Urban and Rural Epidemiology Study. *Environmental Health Perspectives* 2019;127(5):57003
15. Shupler M, Godwin W, Frostad J, Gustafson P, Balakrishnan K, Ghosh S, Arku RE, Brauer M. Global estimation of exposure to fine particulate matter from household air pollution. *Environment International* 2018; 120:354-363
 16. Arku RE, Birch A, Shupler M, Yusuf S, Hystad P, Brauer M. Characterizing household air pollution exposure in rural communities in low- and middle-income countries within the Prospective Urban Rural Epidemiology (PURE) Study. *Environment International* 2018; 114: 307–317
 15. Arku RE, Ezzati M, Baumgartner J, Fink G, Zhou B, Hystad P, Brauer M. Elevated blood pressure and household solid fuel use in premenopausal women: Analysis of 12 Demographic and Health Surveys (DHS) from 10 countries. *Environmental Research* 2017; 160:499–505
 14. Arku RE, Bennett JE, Castro MC, Agyeman-Duah K, Mintah SE, Ware JH, Nyarko P, Spengler JD, Agyei-Mensah S, Ezzati M. Geographical inequalities and social and environmental risk factors for under-five mortality in Ghana in 2000 and 2010: Bayesian spatial analysis of census data. *Plos Medicine* 2016; 13(6): e1002038
 13. MacNaughton P*, Adamkiewicz G*, Arku RE*, Vallarino J, Levy DE. The impact of a smoke-free policy on environmental tobacco smoke exposure in public housing developments. *Science of the Total Environment* 2016; 557–558:676–680
 12. Arku RE*, Adamkiewicz G*, Vallarino J, Spengler JD, Levy DE. Seasonal variability in environmental tobacco smoke exposure in public housing developments. *Indoor Air* 2015; 25(1):13-20
 11. Arku RE, Dionisio KL, Hughes AF, Spengler JD, Agyei-Mensah S, Ezzati M. Personal particulate matter exposures and locations of students in four neighborhoods in Accra, Ghana. *Journal of Exposure Science and Environmental Epidemiology* 2014; 25:557-566
 10. Zhou Z, Dionisio KL, Thiago GV, Americo SK, Coull B, Howie S, Arku RE, Koutrakis P, Spengler JD, Fornace K, Hughes AF, Vallarino J, Agyei-Mensah S, Ezzati M. Chemical characterization and source apportionment of household fine particulate matter in rural, peri-urban, and urban West Africa. *Environmental Science and Technology* 2014; 48 (2):1343-1351
 9. Zhou Z, Dionisio KL, Verissimo TG, Kerr AS, Coull B, Arku RE, Koutrakis P, Spengler JD, Hughes AF, Vallarino J, Agyei-Mensah S, Ezzati M. Chemical composition and sources of particle pollution in affluent and poor neighborhoods of Accra, Ghana. *Environmental Research Letters* 2013; 8:044025
 8. Rooney MS*, Arku RE*, Dionisio KL*, Paciorek C, Friedman AB, Carmichael H, Zhou Z, Hughes AF, Vallarino J, Agyei-Mensah S, Spengler JD, Ezzati M. Spatial patterns of particulate matter sources and pollution in four communities in Accra, Ghana. *Science of the Total Environment* 2012; 435-436:107-114
 7. Fink G, Arku RE, Montana L. The health of the poor: women living in informal settlements. *Ghana Medical Journal* 2012; 46(2):104-112
 6. Zhou Z, Dionisio KL, Arku RE, Quaye A, Hughes AF, Vallarino J, Spengler JD, Hill A, Agyei-Mensah S, Ezzati M. Household particulate matter pollution in neighborhoods of Accra, Ghana. *Proceedings of the National Academy of Sciences USA* 2011; 108:11028-33
 5. Dionisio KL, Arku RE, Hughes AF, Vallarino J, Carmichael H, Friedman AB, Agyei-Mensah S, Spengler JD, Ezzati M. Air pollution in Accra neighborhoods: spatial, socioeconomic, and temporal patterns. *Environmental Science and Technology* 2010; 44:2270-2276
 4. Dionisio KL*, Rooney MS*, Arku RE*, Friedman AB, Paciorek C, Hughes AF, Vallarino J, Carmichael H, Agyei-Mensah S, Spengler JD, Ezzati M. Within-neighborhood patterns and sources of particle pollution: mobile monitoring and geographic information system analysis in four communities in Accra, Ghana. *Environmental Health Perspectives* 2010; 118:607-613
 3. Arku RE, Vallarino J, Dionisio KL, Willis R, Choi H, Wilson JG, Hemphill C, Agyei-Mensah S, Spengler JD, Ezzati M. Characterizing air pollution in two low-income neighborhoods in Accra, Ghana. *Science of the Total Environment* 2008; 402:217-231

Book chapters

1. Baumgartner J, Arku RE, Dickinson KL. Household energy solutions in low and middle-income countries. *ScienceDirect* 2019; DOI: 10.1016/B978-0-12-409548-9.11784-1. Reference Module in Earth Systems and Environmental Sciences

WORK EXPERIENCE

2005 Mineral exploration geologist; Wyoming-Newhaven; Ghana

2004 Mineral exploration geologist; KAM & Associates; Ghana

PRESENTATIONS

Oral presentations at the International Society for Environmental Epidemiology and International Society of Exposure Science annual conferences. List of other presentations available upon request.

TRAINEES AND RESEARCH ADVISEES

MA/MSc/MPhil/PhD/Postdoc (subsequent placement)

* Primary advisor or co-advisor

2020- Jessica Daum*
2020- Barbara Mottey*
2019- Jiayuan Wang*
2018- Abosede Sarah Alli*
2015-2018 Aaron Birch (Occupational Hygienist; Teck resources limited, BC CA)
2015-2018 Matthew Shupler (Postdoc; University of Liverpool, UK)
2014 Kabibi Adunagow (Program Manager; Sustainability & Corporate Social Responsibility, Taco Bell)*

PEER REVIEW ACTIVITIES

List of journals reviewed for available upon request