

Title (Qingyu Meng, PhD): Air Pollution Exposure and Air Quality Assessments in Kampala/Uganda

Abstract (Qingyu Meng, PhD): Air pollution is a global public health problem. Air quality in Kampala, the capital of Uganda, has deteriorated significantly with the fast-paced urbanization in the last decade. Concentrations and spatial variation of major criteria air pollutants ($PM_{2.5}$, NO_2 , SO_2 , O_3) were measured. Pollutants were measured at various sites representing different topography and land uses: commercial, industrial and residential (paved & unpaved roads). $PM_{2.5}$ was measured with a real-time monitor at 15 sites in Kampala. NO_2 and SO_2 were measured with diffusion tubes at 22 sites in Kampala. O_3 , NO_2 , temperature and humidity were measured with a real-time monitor in the city center of Kampala over a seven-day period in June of 2014. The 24-hour mean $PM_{2.5}$ was $132.1 \mu\text{g}/\text{m}^3$. By land use, $PM_{2.5}$ concentrations were $156 \mu\text{g}/\text{m}^3$ (industrial areas), $152.6 \mu\text{g}/\text{m}^3$ (residential areas, unpaved roads), $129.4 \mu\text{g}/\text{m}^3$ (commercial centers), and $88.3 \mu\text{g}/\text{m}^3$ (residential areas, paved roads). Highest peak $PM_{2.5}$ concentrations were recorded at night (72.2 %, 13/18 sites). Markers for crustal/soil (e.g. Si and Al) were the most abundant in the $PM_{2.5}$ fraction, followed by biomass burning and incinerator emissions. $PM_{2.5}$ functional groups and carbon will also be reported. NO_2 concentrations also exceeded USEPA's 1-hr standard (100 ppb). A pilot focus group discussion and key informant interviews were also conducted for average people and government officials. Assessments of air pollution levels in cities of Sub-Saharan Africa have been spotty and completely missing in Uganda. Our studies provide a first assessment demonstrating seriously elevated air pollution levels in Uganda. The results of our studies are indicative of unhealthy ambient air in Kampala. Exposure to this air may increase the burden of environmentally induced diseases. Experience from other developing countries on air pollution exposure reduction will be discussed. Future plans for air pollution exposure assessment and exposure reduction will also be discussed.

Biosketch (Qingyu Meng, PhD): Dr. Qingyu Meng is an Assistant Professor at the School of Public Health, Rutgers University. He is also a member of the graduate faculty in Environmental Sciences at Rutgers University. Dr. Meng received his B.A. (1997) in Environmental Chemistry (with a Minor in Law), from Nanjing University, M.S. (2000) in Environmental Science from Chinese Academy of Sciences, M.S. (2004) in Statistics from Rutgers University, and Ph.D. (2004) in Environmental Science from Rutgers University. Dr. Meng's research expertise includes air quality characterization, measuring and modeling individual and population exposures to criteria air pollutants and air toxics, exposure and risk assessments, and exposure reduction in global public health settings. Prior to his move to Rutgers University, Dr. Meng was appointed ORISE Fellow (2006 – 2010) at National Center for Environmental Assessment, U.S. Environmental Protection Agency, where he was involved in integrated science assessments, which serve as the scientific basis for setting National Ambient Air Quality Standards for criteria pollutants.