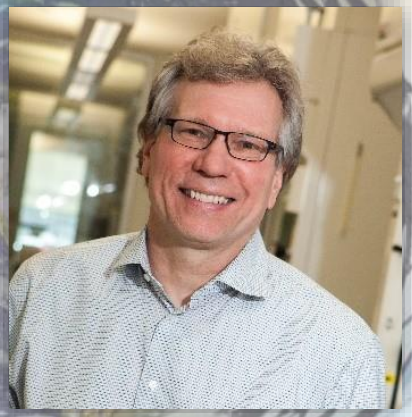
Particulate Matter Air Pollution in Central Asia: A Case Study of Bishkek, Kyrgyzstan



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This presentation will first briefly compare and contrast fine particulate matter ($PM_{2.5}$) air quality across Hong Kong and Central Asia. Subsequently, I will summarize our efforts to improve the state-of-knowledge for $PM_{2.5}$ in Central Asia, focusing on a case study of Bishkek, Kyrgyzstan. A recently-conducted project demonstrated high spatial variability in annual $PM_{2.5}$ concentrations across the city, with population-weighted bottom decile value (~22 $\mu g/m^3$) exceeding WHO Interim Target 3, population-mean value (~40 $\mu g/m^3$) exceeding WHO Interim Target 1, and a population-weighted top decile value of ~60 $\mu g/m^3$. The observed factor of four spatial variability is driven by a combination of spatially varying emissions–dominated by residential coal combustion in the wintertime–and mountain/valley airflow dynamics. Spatial modeling of outdoor $PM_{2.5}$ was combined with $PM_{2.5}$ indoor/outdoor ratios measured at nearly fifty households (with different primary heating sources) to estimate time-activity weighted exposure distributions for the city's population. Indoor $PM_{2.5}$ values were on average ~50% of outdoor values and driven by infiltration of outdoor air. Annual deaths and disability adjusted life years (DALYs) were estimated. A contingent valuation study was conducted to generate a Bishkek-specific Value of a Statistical Life (VSL) and a Willingness-to-Pay (WTP) for improved health that would arise from reduced air pollutant exposures. Possible interventions to reduce exposures will be presented.

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Zoom Link (Mixed-mode)

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