Kelvin Fong

Postdoctoral Associate, Yale University School of Forestry and Environmental Studies
kelvin.fong@yale.edu   https://kelvinfong.ca

STATEMENT OF PURPOSE

Our surroundings and environmental exposures have major impacts on our health. Through research, I strive to minimize health detriments, especially among vulnerable populations.

EDUCATION

Doctor of Science, **Harvard TH Chan School of Public Health, May 2018**
Environmental Epidemiology, Department of Environmental Health
Committee: Joel Schwartz (Chair), Francine Laden, Brent Coull, Petros Koutrakis

Master of Science, **ETH Zurich (Swiss Federal Institute of Technology), December 2012**
Environmental Sciences: Human Health, Nutrition, and Environment

Honours Bachelor of Science, **University of Toronto, June 2010**
High distinction in Physiology and Music

CURRENT POSITION

School of Forestry and Environmental Studies, Yale University
Postdoctoral Associate, July 2018 – present

Environmental Health Disparities in an Aging Population
- Assessing environmental exposures with big spatiotemporal data repositories for epidemiologic research
- Developing methods to reproducibly and efficiently perform spatial data linkage and analysis on computing clusters
- Designing and performing epidemiologic studies to estimate mortality and morbidity disparities in elderly populations across the United States
- Estimating the causal effects of potential air pollution and other environmental policies on health disparities among sociodemographic subgroups
- Writing grants to investigate the intersection of environmental and immigrant health

PUBLICATIONS

Fong KC, Mehta NK, Bell ML. Disparities in Exposure to Surrounding Greenness Related to Proportion of the Population that were Immigrants to the United States. *International Journal of Hygiene and Environmental Health 2020*, 224: 113434.

Nori-Sarma A, Thimmulappa RK, Venkataramana GV, Fauzie AK, Dey SK, Venkareddy LK, Berman JD, Lane KJ, **Fong KC**, Warren JL, Bell ML. Low-Cost NO2 Monitoring and Predictions of Urban Exposure Using Universal Kriging and Land-Use Regression Modelling in Mysore, India. *Atmospheric Environment* 2020, 226: 117395.

Fong KC, Kosheleva A, Kloog I, Coull BA, Koutrakis P, Laden F, Schwartz JD. Fine Particulate Air Pollution and Birthweight: Differences in Associations along the Birthweight Distribution. *Epidemiology 2019, 30(5): 617-623.*

Fong KC, Di Q, Kosheleva A, Coull BA, Koutrakis P, Laden F, Schwartz JD. Relative Toxicities of Major Particulate Matter Constituents on Birthweight in Massachusetts. *Environmental Epidemiology 2019, 3(3): e047.*

Gaskins AJ, Minguez-Alarcon L, **Fong KC**, Abu Awad Y, Di Q, Chavarro JE, Ford JB, Coull BA, Schwartz JD, Kloog I, Attaman J, Hauser R, Laden F. Exposure to Fine Particulate Matter and Ovarian Reserve among Women from a Fertility Clinic. *Epidemiology 2019, 30(4): 486-491.*

Gaskins AJ, Minguez-Alarcon L, **Fong KC**, Abu Awad Y, Di Q, Chavarro JE, Ford JB, Coull BA, Schwartz JD, Kloog I, Attaman J, Hauser R, Laden F. Supplemental Folate Intake Modifies the Relation Between Traffic-Related Air Pollution and Live Birth Among Women Undergoing Assisted Reproduction. *American Journal of Epidemiology 2019, 188(9): 1595-1604.*

Gaskins AJ, **Fong KC**, Abu Awad Y, Di Q, Minguez-Alarcon L, Chavarro JE, Ford JB, Coull BA, Schwartz JD, Kloog I, Souter I, Hauser R, Laden F. Time-varying Exposure to Air Pollution and Outcomes of In Vitro Fertilization Among Couples from a Fertility Clinic. *Environmental Health Perspectives 2019, 127(7).*

Heo, S, **Fong KC**, Bell ML. Risk of particulate matter on birth outcomes in relation to maternal socio-economic factors: a systematic review. Environmental Research Letters 2019, 14: 123004.

Kim ES, **Fong KC**, Lee L, Spiro A, Schwartz JD, Whitsel E, Horvath S, Wang CC, Hou L, Baccarelli AA, Li Y, Stewart J, Manson JE, Grodstein F, DeMeo DL, Kubzansky LD. Optimism is Not Associated with Two Indicators of DNA Methylation Aging. *Aging 2019, 11(14): 4970-4989.*

Yitshak-Sade M, James P, Kloog I, Hart JE, Schwartz JD, Laden F, Lane KJ, Fabian MP, **Fong KC**, Zanobetti A. Neighborhood Greenness Attenuates the Adverse Effect of PM2.5 on Cardiovascular Mortality in Neighborhoods of Lower Socioeconomic Status. *Int. J. Environ. Res. Public Health 2019, 16(5): 814.*

Fong KC, Kloog I, Coull BA, Koutrakis P, Laden F, Schwartz JD, James P. Residential Greenness and Birthweight in the State of Massachusetts, USA. *Int. J. Environ. Res. Public Health, 2018, 15(6): 1248.*

Fong KC, Hart JE, James P. A Review of Epidemiologic Studies on Greenness and Health: Updated Literature Through 2017. *Curr Environ Health Rep, 2018, 5(1): 77-87.*

Schwartz JD, **Fong KC**, Zanobetti A. A National Multi-City Analysis of the Causal Effect of Local Pollution, NO2, and PM2.5 on Mortality. *Environmental Health Perspectives 2018, 126(8).*

Fong KC, Nussbaumer T. Health Effects of Aerosols from Wood Combustion. *Zurich & Bern, Swiss Federal Office for the Environment. 2012.*

RESEARCH EXPERIENCE

Department of Environmental Health, Harvard TH Chan School of Public Health
Graduate Research Assistant, September 2013 – May 2018

Environmental Exposures during Pregnancy and Birth Weight (Dissertation Focus)
- Conceptualized, designed, and performed data linkage (> 1 mil. records) of mothers' geographic information to air pollution predictions and environmental variables
- Applied quantile regression and showed that lighter newborns were more severely affected by particulate air pollution ($PM_{2.5}$) than average-weight or heavier newborns
- Assessed nonlinearity using splines and effect modification by socioeconomic status in the relationship between residential greenness exposure and birth outcomes
- Evaluated the relative toxicity of different constituents of $PM_{2.5}$ on birthvweight

Optimism and Healthy Aging (Collaboration with Social and Behavioral Sciences Department)
- Processed large sets of epigenetic data to compute methylation age
- Performed mixed effects models to understand how optimism affects the aging process

Neighborhood Social Stressors (Collaboration with Boston University)
- Investigated how neighborhood income and racial polarization affects birth weight outcomes directly and indirectly through environmental exposures

World Health Organization, European Center for Environment and Health
Intern, February 2013 – May 2013
- Compiled, edited, and formatted review of air pollution and health effects
- Authored conference paper on the health and economic impacts of environmental noise

Verenum Engineering Bureau (Zurich, Switzerland)
Pratikant, April 2011 – February 2012
- Wrote report on the health effects of wood combustion aerosols for the Swiss government

Department of Environmental Health, University of Washington (Seattle, WA)
Research Student, Summer 2009
- Investigated effect modification by single nucleotide polymorphisms on the relationship between air pollution exposure and heart left ventricular mass

Division of Critical Care Medicine, St. Michael's Hospital (Toronto, Canada)
Summer Student, Summers 2007, 2008
- Assessed how novel mechanical ventilation strategies affect diaphragm force generation

Department of Chemistry, University of Toronto
Undergraduate Research Student, September 2007 – May 2008
- Researched sources of air pollutants in Toronto using back-trajectory modeling

TEACHING EXPERIENCE

School of Forestry and Environmental Studies, Yale University
Postdoctoral Associate, July 2018 – present
- Developing short course on modern tools for environmental exposure assessment
  - *Scaling up Spatial Analyses: Using Google Earth Engine for Satellite Imagery Retrieval, Processing, and Analysis*
- Participating in teaching workshops by the Poorvu Center for Teaching and Learning
  - *Difficult Conversations in the Classroom (Race, Ethnicity, and Culture)*
  - *Writing Across the Disciplines*

Harvard College and Harvard TH Chan School of Public Health
Teaching Fellow / Assistant, February 2016 – May 2017
- Led tutorials, labs, and graded student work in graduate and undergraduate classes
  - *Analysis of Case-Control and Cohort Studies*
  - *Analytical Methods and Exposure Assessment*
  - *Advanced Regression for Environmental Epidemiology*
  - *Energy and Climate: Vision for the Future*
  - *Environmental and Occupational Epidemiology*
- Revamped advanced regression course to use modern R packages and Rmarkdown
- Developed teaching content on reproducible research and data science online course
  - *Principles, Statistical and Computational Tools for Reproducible Science*
- Completed training by the Bok Center for Teaching and Learning
  - *Active Approaches to Problem-Based Teaching*
  - *Teaching in General Education*

ETH Zurich (Swiss Federal Institute of Technology)
Teaching Assistant, February 2011 – May 2011
- Edited course materials and graded student assignments and exams
  - *Environmental Impacts, Threshold Levels and Health Effects*

PRESENTATIONS

Fong KC. *Advancing Exposure Assessment in Public Health*. Yale University GIS Day, New Haven, Connecticut, 2019.

Fong KC. *Accelerating Exposure Assessment in Environmental Epidemiology*. Earth Engine Group @ Yale Seminar Series, New Haven, Connecticut, 2019.

Fong KC, Bell ML. *Immigrant Proportion and Surrounding Greenness in the United States*. International Society of Environmental Epidemiology Conference, Utrecht, Netherlands, 2019.

Yitshak-Sade M, Fabian MP, Lane KJ , Hart JE, Schwartz JD, Laden F, James P , **Fong KC**, Kloog I, Zanobetti A. *The combined impact of environmental and built environment exposures on birthweight in an urban population in Massachusetts*. International Society of Environmental Epidemiology Conference, Utrecht, Netherlands, 2019.

Gaskins AJ, Minguez-Alarcon L, Williams P, **Fong KC**, Abu Awad Y, Di Q, Chavarro J, Schwartz JD, Hauser R, Laden F. *NO_2 Air Pollution Exposure Assessment in Urban Mysore, India*. International Society of Environmental Epidemiology Conference, Utrecht, Netherlands, 2019.

Nori-Sarma A, Thimulappa R, Venkataramana G, Fauzie A, Dey S, Venkareddy L, Berman J, Lane KJ, **Fong KC**, Bell ML. *NO_2 Air Pollution Exposure Assessment in Urban Mysore, India*. International Societies of Exposure Science (ISES) and Indoor Air Quality and Climate (ISIAQ) Conference, Kaunas, Lithuania, 2019.

Fong KC. *Disparities in Surrounding Greenness by Immigrant Proportion*. Yale F&ES Research Day, Yale University, New Haven, CT, USA, 2019.

Fong KC. *Google Earth Engine and Environmental Epidemiology*. GIS-Day, Yale University, New Haven, CT, USA, 2018.

Fong KC. *Surrounding Residential Greenness and Birthweight*. Chinese University of Hong Kong, Hong Kong, China, 2018. (Invited Seminar)

Fong KC, Lane KJ, Yitshak-Sade M, Kloog I, Hart JE, Fabian MP, Zanobetti A, Schwartz JD, Laden F. *Effect Modification of the $PM_{2.5}$ Association with Birthweight by Local Residential Racial and Economic Segregation*. International Society of Exposure Science and International Society of Environmental Epidemiology Joint Conference, Ottawa, Canada, 2018.

Yitshak-Sade M, Lane KJ, Kloog I, Hart JE, **Fong KC**, Schwartz JD, Laden F, Fabian MP, Zanobetti A. *$PM_{2.5}$ and Mortality: Modification of the Association by Personal and Area Level Indicators of Socioeconomic Status*. International Society of Exposure Science and International Society of Environmental Epidemiology Joint Conference, Ottawa, Canada, 2018.

Gaskins AJ, **Fong KC**, Abu Awad Y, Minguez-Alarcon L, Chavarro JE, Coull BA, Schwartz JD, Hauser R, Laden F. *Time-Varying Exposure to Fine Particulate Matter and Black Carbon and Outcomes of In Vitro Fertilization.* International Society of Exposure Science and International Society of Environmental Epidemiology Joint Conference, Ottawa, Canada, 2018.

Fong KC, Lane KJ, Kloog I, Schwartz JD, Hart JE, Zanobetti A. *The Effects of Neighborhood Social Stressors on Birth Weight*. International Society of Environmental Epidemiology, Sydney, Australia, 2017.

Fong KC, James P, Kosheleva A, Schwartz JD. *Maternal Exposure to Greenness during Pregnancy and Birth Weight*. International Society of Environmental Epidemiology, Sydney, Australia, 2017.

Fong KC, Di Q, Kosheleva A, Kloog I, Schwartz JD. *Contributions to Low Birth Weight by the Constituents of Air Pollution*. International Society of Environmental Epidemiology, Rome, Italy, 2016.

Fong KC, Kosheleva A, Kloog I, Schwartz JD. *Quantile Regression of Maternal Exposure to Particulate Air Pollution and Birth Weight*. International Society of Environmental Epidemiology, Rome, Italy, 2016.

George F, Heroux ME, **Fong KC**. *Public Health and Economic Burden of Environmental Noise*. Internoise: Noise Control for Quality of Life, Innsbruck, Austria, 2013.

Fong KC, Nussbaumer T. *Health Effects of Wood Combustion Aerosols*. 16th ETH Conference on Combustion Generated Nanoparticles, Zurich, Switzerland, 2012.

Fong KC, Haitsma JJ, Zhang H, Slutsky AS. *Lung Protective Ventilation Improves Diaphragm Force Generating Capacity*. Institute of Medical Sciences, University of Toronto, 2008.

Fong KC, Murphy JG. *Atmospheric Pollutants in Downtown Toronto*. Undergraduate Research Fair, University of Toronto, 2008.

AWARDS AND HONORS

Travel Award, International Society of Environmental Epidemiology, 2017, 2019.

Harvard Graduate Consortium on Energy & Environment, Harvard University Center for the Environment, 2015-2017.

Benjamin Greeley Ferris, Jr Fellowship in Environmental Epidemiology, Harvard TH Chan School of Public Health, 2015.

Glickenhaus Fund, Harvard TH Chan School of Public Health, 2014.

Doctoral Grant, Harvard TH Chan School of Public Health, 2013.

National Laureate, Excellence Awards, Canadian Merit Scholarship Foundation, 2008-2010.

Dean's List, University of Toronto, 2007-2010.

Dean's List, University of Washington, 2009.

Killam Fellowship, Fulbright Canada, 2009.

Finalist, St. Michael's Hospital Poster Competition, 2008.

Al Mercury Award, University of Toronto, 2008.

Walter and Mary Tuohy Award in Arts and Science, University of Toronto, 2008.

C.L. Burton Open Scholarship, University of Toronto, 2007

SKILLS

Computer	Statistical Modeling in R, Python, and SAS Geographic Analysis in R, Google Earth Engine, ArcGIS Linux, SLURM
Languages	English & Cantonese (fluent) German (advanced) French & Mandarin (basic)

SERVICE

Reviewer	*Atmosphere* (also board member)*;* *Epidemiology;* *Journal of Exposure Science and Environmental Epidemiology;* *International Journal of Hygiene and Environmental Health;* *International Journal of Environmental Research and Public Health;* *Urban Forestry & Urban Greening*
Steering Committee	International Society of Environmental Epidemiology (ISEE) - Student and New Researcher Network, Capacity Building and Education Committee