

# Kelvin Fong

Postdoctoral Associate, Yale University School of Forestry and Environmental Studies  
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## **EDUCATION**

### **Doctor of Science, Harvard TH Chan School of Public Health, 2018**

Environmental Epidemiology, Department of Environmental Health

### **Master of Science, ETH Zurich (Swiss Federal Institute of Technology), 2012**

Environmental Sciences: Human Health, Nutrition, and Environment

### **Honours Bachelor of Science, University of Toronto, 2010**

High distinction in Physiology and Music

## **WORK EXPERIENCE**

### **School of Forestry and Environmental Studies, Yale University, New Haven, CT**

*Postdoctoral Associate*, July 2018 – present

#### Environmental Health Disparities in an Aging Population

- Processing satellite imagery with Google Earth Engine for epidemiologic research
- Developing software packages in R to reproducibly and efficiently perform spatial statistics and data linkage on computing clusters
- Designing epidemiologic studies to quantify environmental health disparities in the elderly populations in North Carolina, Michigan, and Texas
- Writing grants to study the causal effects of potential air pollution and other environmental policies on health disparities among sociodemographic subgroups

### **Department of Environmental Health, Harvard TH Chan School of Public Health, Boston, MA**

*Doctoral Candidate*, September 2015 – May 2018

*Graduate Research Assistant*, September 2013 – May 2018

#### Environmental Exposures during Pregnancy and Birthweight (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<sub>2.5</sub>) than normal-weight or heavier newborns
- Assessed nonlinearity using splines and effect modification by socioeconomic status in the relationship between residential greenness and birth outcomes
- Evaluated the relative toxicity of different constituents of PM<sub>2.5</sub> on birthweight

#### Optimism and Healthy Aging (Collaboration with Social and Behavioral Sciences Department)

- Cleaned large sets of epigenetic data to compute methylation age
- Performed mixed effects models to assess how optimism impacts the aging process

#### Neighborhood Social Stressors (Collaboration with Boston University)

- Led effort to assess how neighborhood income and racial segregation modify effects of environmental exposures on birth outcomes
- Provided big data computing, storage solutions, and IT support to team members

**Harvard College and Harvard TH Chan School of Public Health, Cambridge / Boston, MA**  
*Teaching Assistant / Fellow*, February 2016 – May 2017

- Led tutorials, labs, and graded student work in graduate and undergraduate classes
  - Environmental and Occupational Epidemiology
  - Advanced Regression for Environmental Epidemiology
  - Analytical Methods and Exposure Assessment
  - Energy and Climate: Vision for the Future
  - Analysis of Case-Control and Cohort Studies
- 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

**World Health Organization: European Center for Environment and Health, Bonn, Germany**  
*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**  
*Pratikan*, April 2011 – February 2012

- Performed literature survey of the health effects of aerosols from wood combustion 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 left ventricular mass

**Division of Critical Care Medicine, St. Michael's Hospital, Toronto, Canada**  
*Summer Student*, Summers 2007, 2008

- Investigated the effects of novel mechanical ventilation strategies on diaphragm atrophy and force-generating capacity

## **PUBLICATIONS**

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).
- 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, NO<sub>2</sub>, and PM<sub>2.5</sub> 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.

## PRESENTATIONS

- 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<sub>2</sub> 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<sub>2</sub> 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<sub>2.5</sub> 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<sub>2.5</sub> 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.

**Glickenhau 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
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## **SERVICE**

Reviewer	<i>Epidemiology;</i> <i>Journal of Exposure Science and Environmental Epidemiology;</i> <i>International Journal of Hygiene and Environmental Health;</i> <i>International Journal of Environmental Research and Public Health;</i> <i>Urban Forestry &amp; Urban Greening</i>
Steering Committee	International Society of Environmental Epidemiology (ISEE) - Student and New Researcher Network, Capacity Building and Education Committee