

Proposed Study:

The Effects of In Utero and Neonatal Wildfire Smoke Exposure on Birth Outcomes and Health in Early Life

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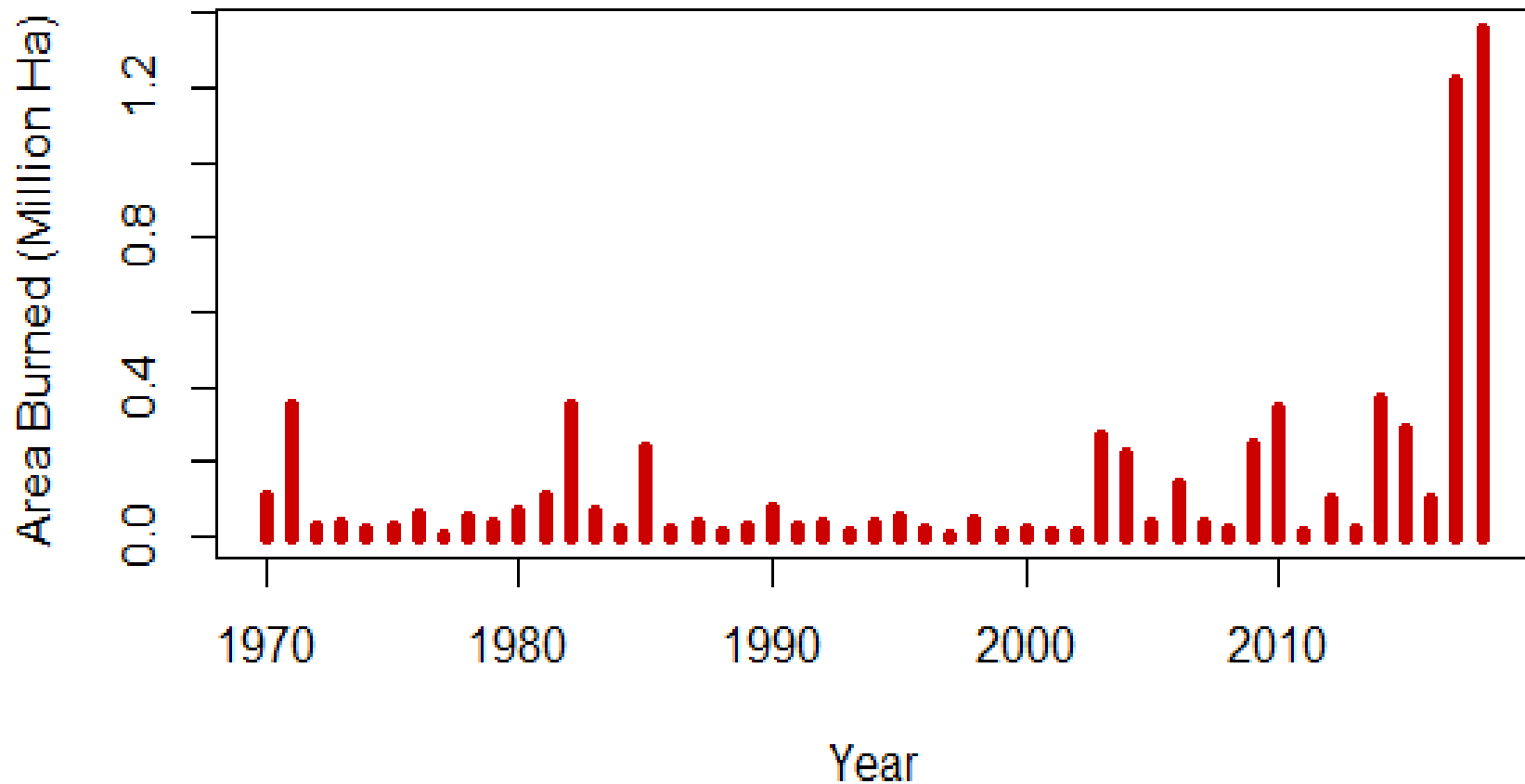


Image: <https://dribbble.com/shots/4751611-Pregnant-Woman-Illustration#shot-description>



Wildfires:
Climate change's new normal

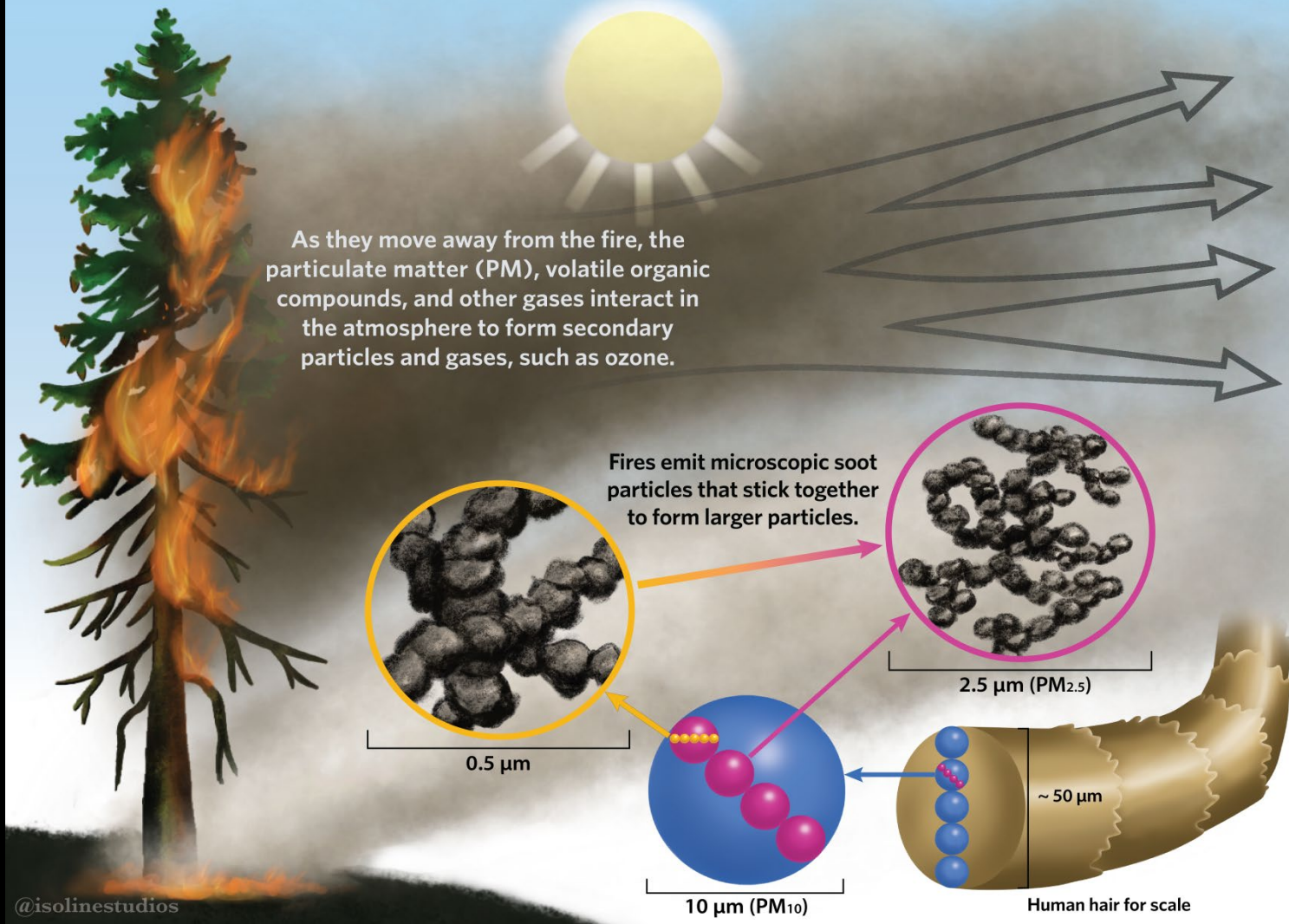
Changing wildfire regime in BC



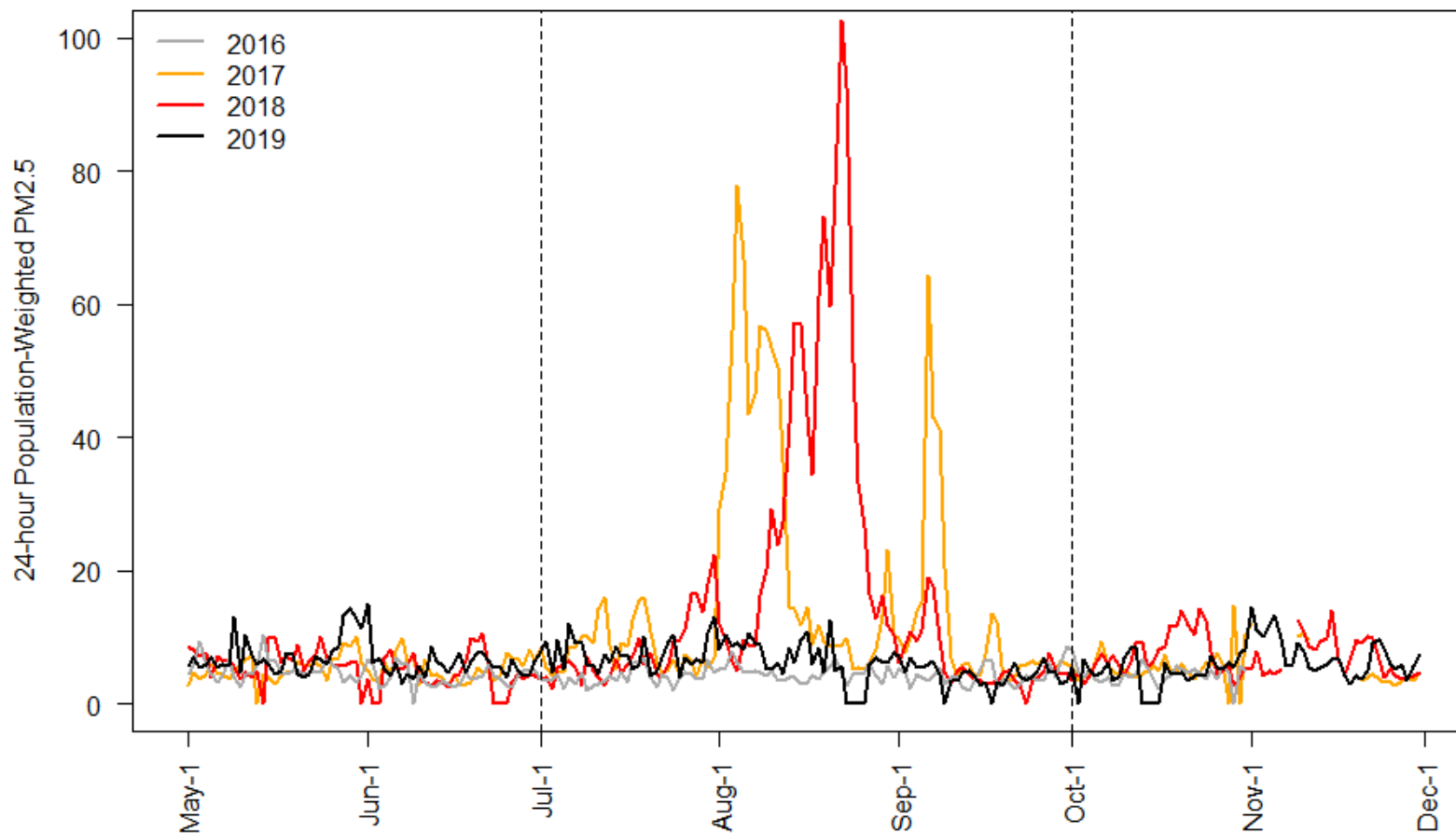


Wildfire smoke leads to some of the worst air quality most Canadians ever experience.

PM_{2.5} : Proxy pollutant

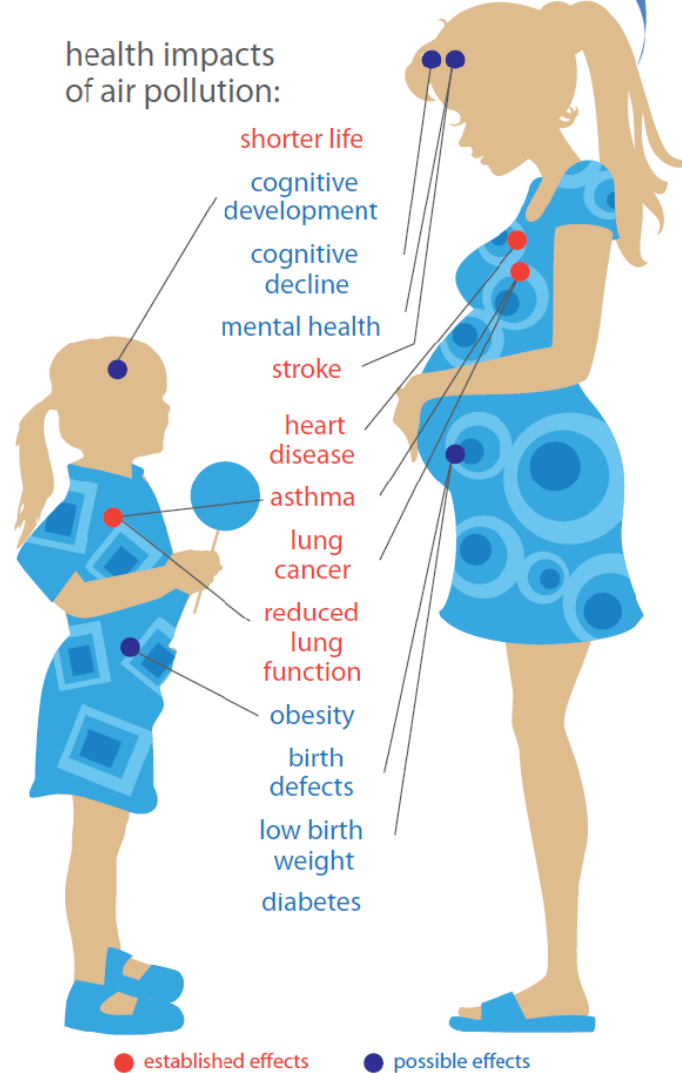



Extreme and prolonged smoke exposure



General ambient PM pollution:

- **Sufficient evidence** for cardiovascular and respiratory mortality and morbidity
- **Growing evidence** for birth outcomes and childhood respiratory disease
- **Possible links** with neurodevelopment and cognitive function, diabetes



A dramatic background image featuring a large, intense wildfire with bright orange and yellow flames. In the foreground, the dark silhouette of a person with long, flowing hair is visible, looking upwards towards the fire. The overall mood is one of awe and potential danger.

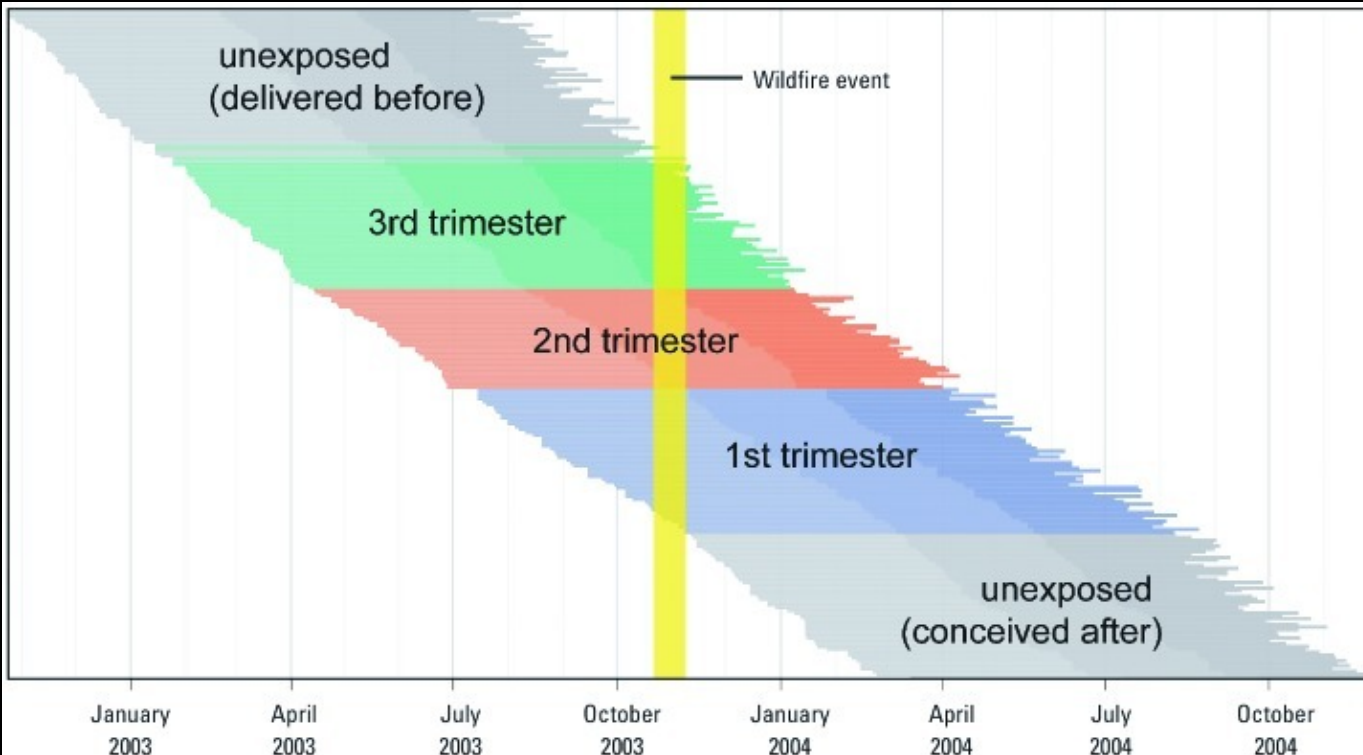
Even less is known about the health effects of exposure to air pollution from wildfire in early life.

Birth Weight following Pregnancy during the 2003 Southern California Wildfires

David M. Holstius,¹ Colleen E. Reid,¹ Bill M. Jesdale,² and Rachel Morello-Frosch^{2,3}

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Compared with pregnancies before and after the wildfires, mean birth weight was **7.0 g lower** [95% CI: -11.8, -2.2]

Children aged 0–1 experienced a ~200% increase in emergency department presentations for asthma and acute bronchitis during wildfire smoke periods compared with reference periods.

RESEARCH ARTICLE

The San Diego 2007 wildfires and Medi-Cal emergency department presentations, inpatient hospitalizations, and outpatient visits: An observational study of smoke exposure periods and a bidirectional case-crossover analysis

Justine A. Hutchinson, Jason Vargo, Meredith Milet, Nancy H. F. French, Michael Billmire, Jeffrey Johnson, Sumi Hoshiko 

Published: July 10, 2018 • <https://doi.org/10.1371/journal.pmed.1002601>



Early Life Wildfire Smoke Exposure Is Associated with Immune Dysregulation and Lung Function Decrements in Adolescence

Carolyn Black¹, Joan E. Gerriets¹, Justin H. Fontaine¹, Richard W. Harper², Nicholas J. Kenyon², Fern Tablin³, Edward S. Schelegle³, and Lisa A. Miller^{1,3}

+ Author Affiliations

<https://doi.org/10.1165/rcmb.2016-0380OC>

PubMed: [28208028](https://pubmed.ncbi.nlm.nih.gov/28208028/)

Wildfire smoke exposure during infancy is associated with **reduced lung volume** in adolescence.



A rhesus macaque mother holds her baby at the California National Primate Center at UC Davis. K. West/Courtesy photo

Exposure to air pollution during the first 1000 days of life and subsequent health service and medication usage in children[☆]

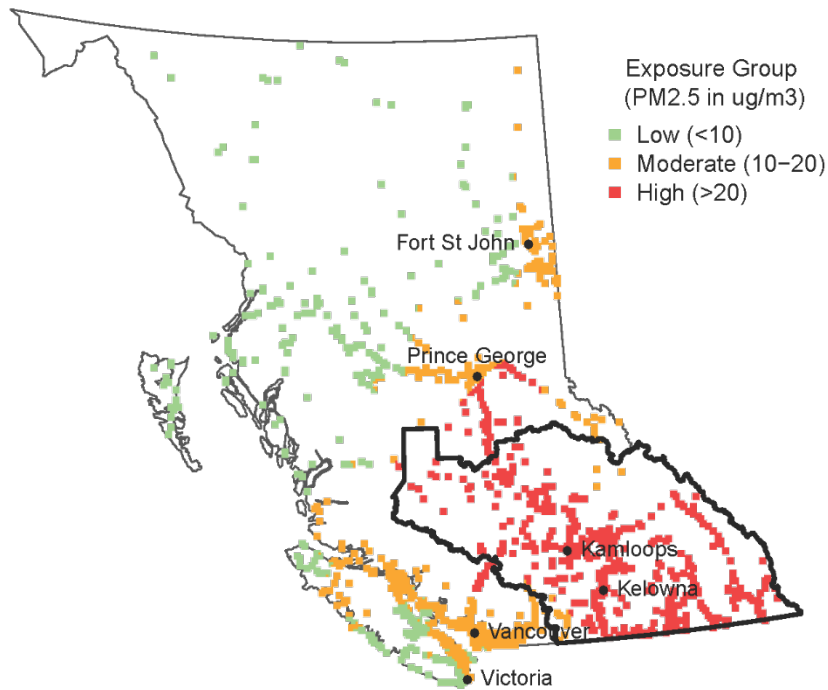
Jingyi Shao^a, Graeme R. Zosky^{a, b}, Amanda J. Wheeler^{a, c}, Shyamali Dharmage^d,
Marita Dalton^a, Grant J. Williamson^e, Tierney O'Sullivan^a, Katherine Chappell^a,
Luke D. Knibbs^f, Fay H. Johnston^{a, *}



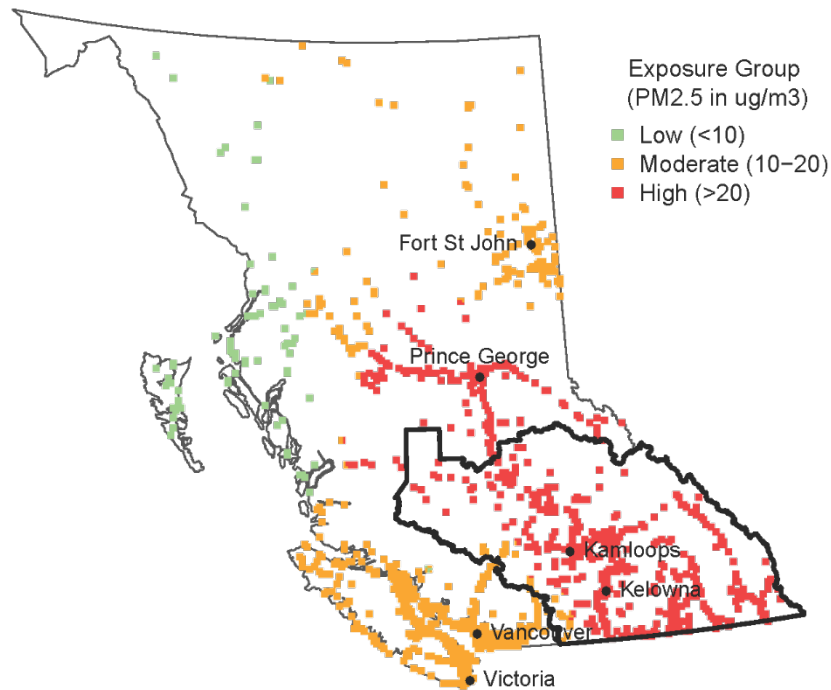
10 $\mu\text{g}/\text{m}^3$ increase in $\text{PM}_{2.5}$
exposure during infancy
associated with **24%**
increase in incidence of
antibiotics dispensation.

Exposure in extreme years

2017 window

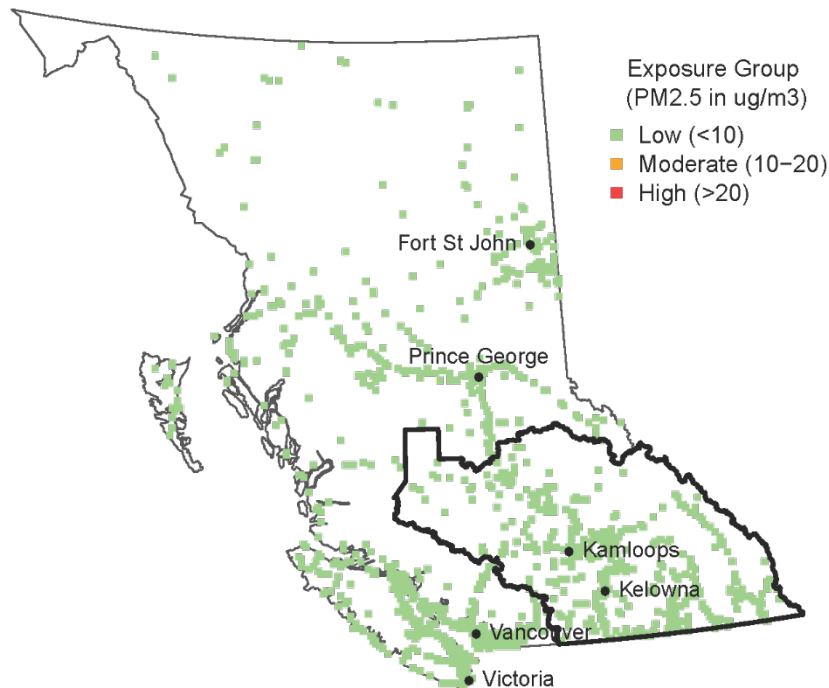


2018 window

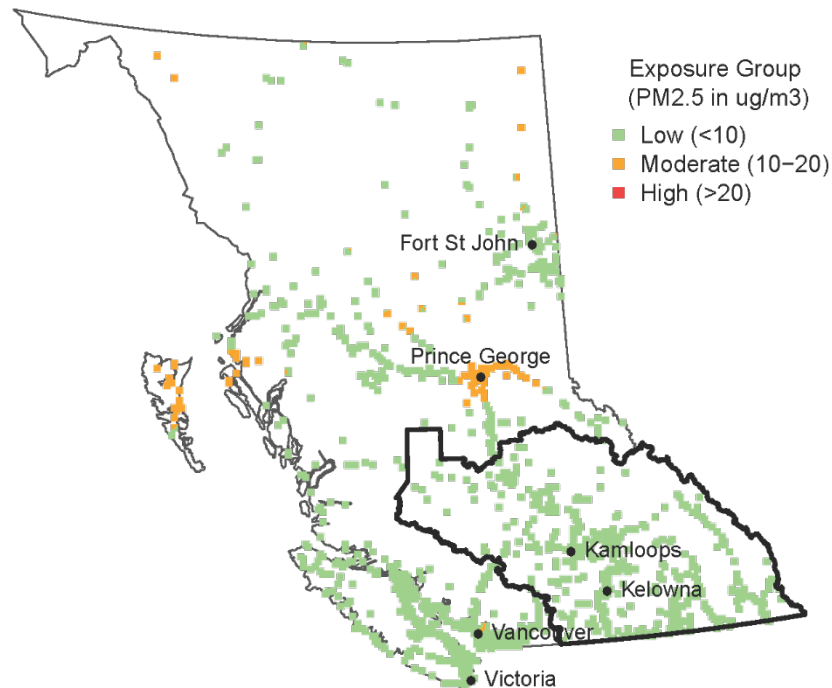


Exposure in milder years

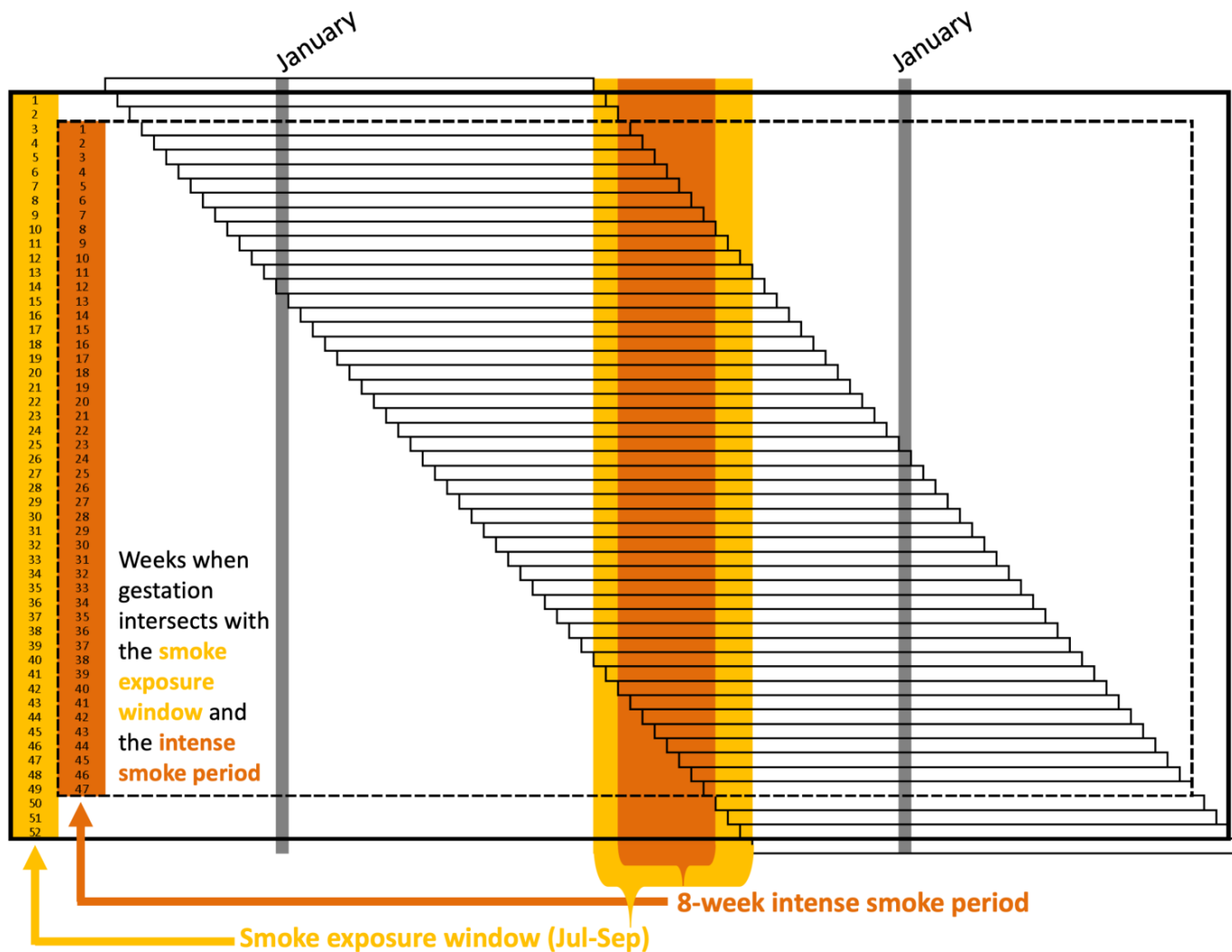
2016 window



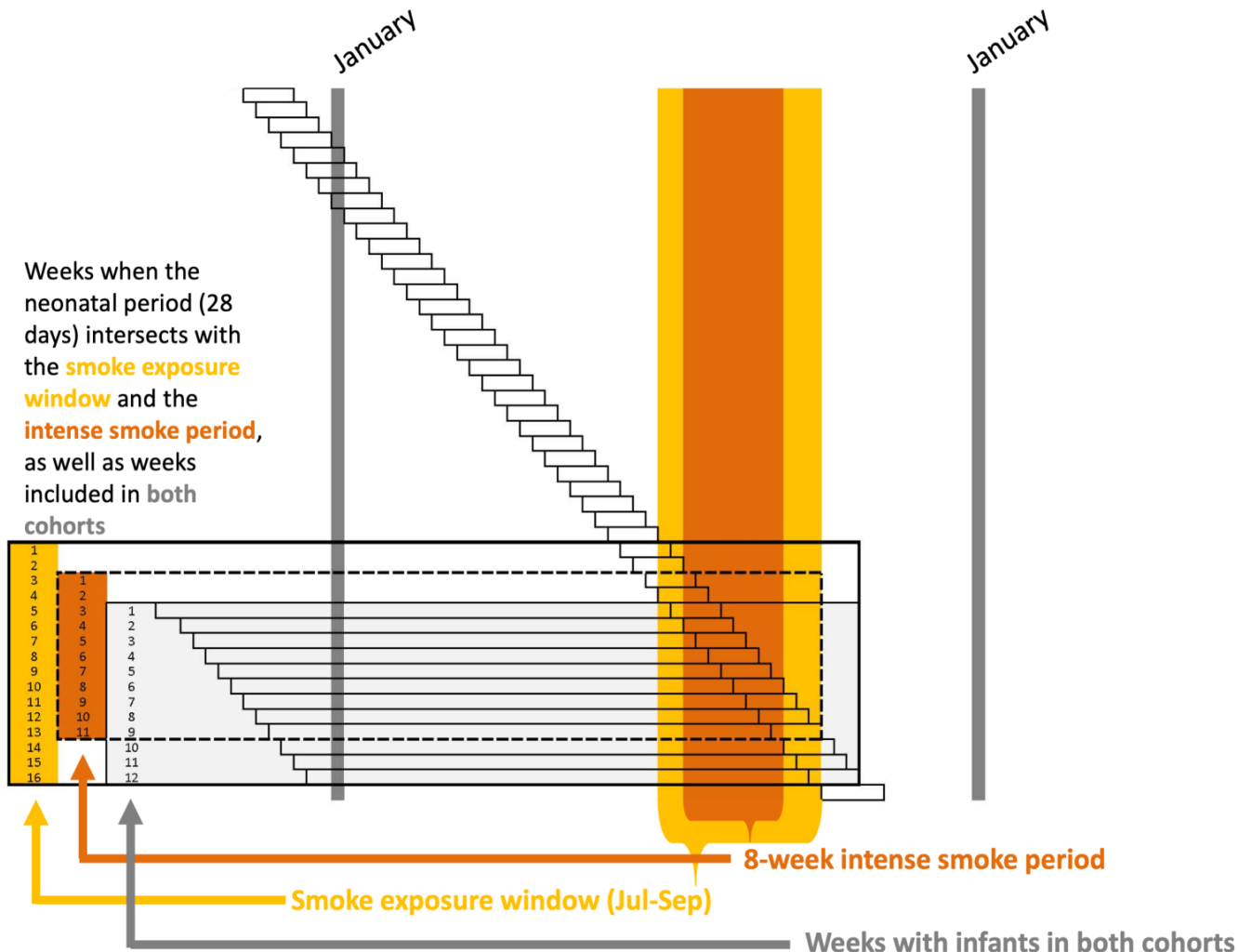
2019 window



Conception
cohort
~180,000



Neonatal
cohort
~56,000



Outcomes of interest



Birth: stillbirth; birth defects; preterm birth; small for gestational age, term low birth weight; full term birth weight



Early life: non-accidental death; respiratory disease; congenital heart defects not identified at birth; ear infections; antibiotic prescriptions

A person in a white shirt and dark pants is running in a green field, holding a string attached to a pink and red kite flying in a blue sky. The kite has a long, thin tail.

Thank you!

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