Matthew H Secrest

About Me

Epidemiologist, data scientist, developer. Master's in Epidemiology from McGill. Coauthor of many peer-reviewed publications. Interested in epidemiologic and biostatistical methods and building software to implement them. Experienced with diverse real-world data sources (EMR, claims, next-gen sequencing) as well as clinical trial data. R, python, SQL, STAN, Java, C.

Contact

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Technical Skills

Domain Expertise: Epidemiology and study design, oncology, drug development, biostatistics, data quality, machine learning, modeling, visualization, data wrangling

Languages: R (tidyverse, shiny), SQL, Python (Pandas), Java, STAN, C

Data Visualization: ggplot2

Version Control: git

Education

Master of Computer and Information Technology | University of Pennsylvania | ongoing (2025)

Master of Science, Epidemiology | McGill University | 2016

Bachelor of Science, Chemistry | Wake Forest University | 2010

Experience

Principal Data Scientist | Genentech | 8/2024 - Present

Design and execute real-world/observational epidemiologic studies using EMR, claims, and NGS data to support product development in oncology. Develop dashboards and R packages (e.g., `psborrow2`) to improve research reproducibility and efficiency.

Senior Data Scientist | Genentech | 10/2021 - 8/2024

Data Scientist | Genentech | 3/2020 - 10/2021

Clinical Data Scientist | Verana Health | 11/2019 - 3/2020

Designed and executed real-world data epidemiologic studies in ophthalmology and neurology using proprietary EMR data. Mapped unstructured EMR data to structured clinical features.

Fellow | The Data Incubator | 9/2019 - 11/2019

Participated in an advanced, 8-week data science program designed to transition academic researchers to industry research. Created a Heroku app to predict the likelihood of drug approval from a clinical trial abstract using natural language processing.

Consultant | IQVIA | 8/2017 − 9/2019

Designed and managed studies of drug safety and effectiveness in secondary datasets for market access (single arm, historical comparator), label expansion, and post-marketing surveillance. Researched rare disease prevalence through literature reviews and steady-state disease modeling. Evaluated risk evaluation and mitigation strategy effectiveness.

Research Assistant | Lady Davis Institute | 7/2016 - 7/2017

Developed a method for a unique missing data problem in distributed data and evaluated its effectiveness in >1000GB of simulated patient-level data via a super-computer and in real EMR data from 59,957 patients in the UK. Designed a study advocating for increased study population restriction to reduce bias.

Research Assistant | Jill Baumgartner's Group | 8/2014 – 6/2016

Conducted household air pollution measurements in China, creating an R program at the field site to convert raw sensor data from to climate modeling inputs. Analyzed the composition of 20 air pollution samples to identify pollution sources that generate high oxidative potential with factor analysis.

Senior Media Analyst | iCrossing | 11/2012 – 7/2014

Analyzed marketing data using a proprietary software.

Research Fellow | New York University | 8/2011 – 8/2012

Developed methods for chemical synthesis and instructed classes and laboratories.

Fulbright Fellow | US Department of State | 9/2010 – 5/2011

Taught English to French high schoolers and conducted sociologic researched informed by primary data collection.

Publications

Peer-reviewed manuscripts

In chronological order:

1. Carter E, Archer-Nicholls S, Ni K, Lai AM, Niu H, Secrest MH, Sauer SM, Schauer JJ, Ezzati M, Wiedinmyer C, Yang X. Seasonal and diurnal air pollution from residential cooking and space heating in the Eastern Tibetan Plateau. *Environmental Science & Technology.* 2016 Aug 2;50(15):8353-61.

2. Secrest MH, Schauer JJ, Carter EM, Lai AM, Wang Y, Shan M, Yang X, Zhang Y, Baumgartner J. The oxidative potential of PM2. 5 exposures from indoor and outdoor sources in rural China. *Science of the Total Environment.* 2016 Nov 15;571:1477-89.

3. Secrest MH, Schauer JJ, Carter EM, Baumgartner J. Particulate matter chemical component concentrations and sources in settings of household solid fuel use. *Indoor Air.* 2017 Nov;27(6):1052-66.

4. Secrest MH, Udell JA, Filion KB. The cardiovascular safety trials of DPP-4 inhibitors, GLP-1 agonists, and SGLT2 inhibitors. *Trends in Cardiovascular Medicine.* 2017 Apr 1;27(3):194-202.

5. Moresoli P, Habib B, Reynier P, Secrest MH, Eisenberg MJ, Filion KB. Carotid stenting versus endarterectomy for asymptomatic carotid artery stenosis: a systematic review and meta-analysis. *Stroke.* 2017 Aug;48(8):2150-7.

6. Wu JW, Azoulay L, Huang A, Paterson M, Wu F, Secrest MH, Filion KB. Identification of incident pancreatic cancer in Ontario administrative health data: A validation study. *Pharmacoepidemiology and Drug Safety.* 2020 Jan;29:78-85.

7. Secrest MH, Platt RW, Dormuth CR, Chateau D, Targownik L, Nie R, Doyle CM, Dell'Aniello S, Filion KB. Extreme restriction design as a method for reducing confounding by indication in pharmacoepidemiologic research. *Pharmacoepidemiology and Drug Safety.* 2020 Jan;29:26-34.

8. Secrest MH, Platt RW, Reynier P, Dormuth CR, Benedetti A, Filion KB. Multiple imputation for systematically missing confounders within a distributed data drug safety network: A simulation study and real-world example. *Pharmacoepidemiology and Drug Safety.* 2020 Jan;29:35-44.

9. Secrest MH, Azoulay L, Dahl M, Clemens KK, Durand M, Hu N, Targownik L, Turin TC, Dormuth CR, Filion KB. A population-based analysis of antidiabetic medications in four Canadian provinces: Secular trends and prescribing patterns. *Pharmacoepidemiology and Drug Safety.* 2020 Jan;29:86-92.

10. Secrest MH, Storm M, Carrington C, Casso D, Gilroy K, Pladson L, Boscoe AN. Prevalence of pyruvate kinase deficiency: a systematic literature review. *European Journal of Haematology.* 2020 Apr 12.

11. Kern DM, Cepeda MS, Salas M, Phillips S, Secrest MH, Wedin GP. Frequency of Early Refills for Opioids in the United States. *Pain Medicine.* 2020 Jun 11.

12. Lindsay L, Secrest MH, Rizzo S, Keebler D, Yang F, Tsai L. Factors associated with COVID-19 viral and antibody test positivity and assessment of test concordance: a retrosective cohort study using electronic health records from the USA. *BMJ Open.* 2021.

13. Tan AR, Yun C, Seetasith A, Sheinson D, Walls R, Ngwa I, Reddy JC, Zhang Q, Secrest MH, Lambert P, Sarsour K. Impact of Immune Checkpoint Inhibitors on COVID-19 Severity in Patients with Cancer. *The Oncologist.* 2021.

14. Secrest MH, Phillips S, Cepeda MS, Kern DM, Esposito DB, Wedin GP. Impact of the extended-release/long-acting opioid analgesics risk evaluation and mitigation strategy on prescribing practices. *Journal of Opioid Management.* 2022.

15. Atkins MB, Julian C, Secrest MH, Lee J, Abajo-Guijarro A, McKenna E. Real-World Treatment Patterns and OS in BRAF-Mutant Melanoma Patients Treated with Immunotherapy or Targeted Therapy. *Future Oncology.* 2022.

Posters and Presentations

In chronological order:

1. Secrest MH, Schauer JJ, Carter E, Lai A, Wang Y, Shan M, Zhang Y, Baumgartner J. Chemical speciation and oxidative potential of air pollution exposure in Chinese women cooking and heating with biomass and coal fuels. In: *The McGill Global Environmental Health Conference and the McGill Global Health Conference.* Montreal, Quebec, Canada, October 30, 2015 and November 3, 2015.

2. Secrest MH, Phillips S, Shen SW, Woodcroft KJ, Oliveria SA, Simon TA. Developing a multiphase claims-based algorithm for non-live pregnancy outcomes research. In: *The 34th International Conference on Pharmacoepidemiology & Therapeutic Risk Management.* Prague, Czech Republic, August 22-26, 2018.

3. Wu JW, Azoulay L, Huang A, Paterson JM, Wu F, Secrest MH, Filion KB. Identifcation of incident pancreatic cancer in administrative health data: A validation study by the Canadian Network for Observational Drug Effect Studies (CNODES). In: *The 34th International Conference on Pharmacoepidemiology & Therapeutic Risk Management.* Prague, Czech Republic, August 22-26, 2018.

4. Wells KE, Jiang R, Tyczynski JE, Secrest MH, Oliveria SA. Feasibility assessment for conducting a multi-country post-marketing safety oncology study using secondary data sources in Europe. In: *The 34th International Conference on Pharmacoepidemiology & Therapeutic Risk Management.* Prague, Czech Republic, August 22-26, 2018.

5. Phillips S, Secrest MH, Johnson K, Shen SW, Woodcroft KJ, Oliveria SA, Simon TA. A multiphase claims-based algorithm for live pregnancy outcomes research. In: *The 34th International Conference on Pharmacoepidemiology & Therapeutic Risk Management.* Prague, Czech Republic, August 22-26, 2018.

6. Atkins MB, Julian C, Secrest MH, Lee J, McKenna E. Treatment patterns and overall survival (OS) in advanced melanoma patients with BRAF mutations treated with immunotherapy and targeted therapy (TT) in a real-world setting. In: *ESMO Immuno-Oncology Virtual Congress 2020* Virtual, December 9-12, 2020.

7. Ton TGN, Trinh H, Secrest MH, Komatsubara K, Matheny C, Evers S, Dejardin D, Keshelava N. Overall Survival in CPI-experienced patients with locally-recurrent or metastatic squamous cell carcinoma of the head and neck using real-world data. In: *4th imCORE Scientific virtual summit*, Virtual, March 9-11, 2021.

8. Julian C, Atkins MB, Secrest MH, Lee J, Abajo-Guijarro AM, McKenna E. Treatment patterns and OS in patients with advanced BRAF mutant melanoma treated with immunotherapy and targeted therapy in a real-world setting. In: *4th imCORE Scientific Virtual Summit*, Virtual, March 9-11, 2021.

9. Atkins MB, Julian C, Secrest MH, Lee JS, Abajo AM, McKenna E. Evaluation of patients with surgically resected high-risk melanoma receiving adjuvant therapy in routine clinical practice in the US. In: *ASCO 2021 Annual Meeting* Virtual, June 4-8, 2021.

10. Ascierto PA, Secrest MH, Lambert P, Sarsour K, Tan A, Walls R, Reddy J, Seetasith A, Sheinson D, Ngwa I, Yun C, Zhang Q. Mortality of 1,636 COVID19 cancer patients and associated prognostic factors. In: *ESMO Congress 2021* Virtual, September 16-21, 2021.

11. Chen L, Secrest MH, Yan Y, Kirschbrown W, Thomas P, Ton TGN, Paranthaman N, Eng-Wong J. Melanoma Brain Metastasis in Previously Treated Patients by Tumor Mutation Type. In: *SMR 2021 Annual Meeting* Virtual, October 28-31, 2021.

12. Black J, Chaudhary N, Forys A, Madhavan S, Secrest MH, Wais K. Case study in the development of a framework for quality and reproducibility in inner-sourced packages and self-service analytic dashboards to accelerate common data types. In: *AMIA Annual Symposium 2021* San Diego, CA, USA, October 30 - November 3, 2021.

13. Singal AG, Shamas N, Secrest MH, Tan A, Mahrus S, Daneng L. Emerging real-world treatment patterns for unresectable hepatocellular carcinoma (uHCC) patients following approval of atezolizumab plus bevacizumab (A+B) in the United States (US). In: *AASLD The Liver Meeting 2022* Washington DC, USA, November 4-8, 2022.

14. Secrest MH, Gravestock I, Zhu J, Pang H, Sabanes Bove D. `psborrow2`: an R package for complex, innovative trial designs using Bayesian dynamic borrowing. In: *2023 Joint Statistical Meetings* Toronto, Canada; August 5 - 10, 2023.

15. Lee JM, Schulze K, Nedzesky J, Ng C, Ogale S, Johnson A, Hasan H, Secrest MH, Cohen A, Castellanos E, Estola E, Estevez M, Lee JS. Real-world biomarker testing and treatment patterns identified using machine learning in early non-small cell lung cancer. *2023 World Conference on Lung Cancer* Singapore; September 9 - 12, 2023.

16. Pang H, Shan M, Secrest MH, Khanal M. Integrating External Control Subjects in the Design and Analysis of Randomized Controlled Trials. Short course in *2024 Joint Statistical Meetings* Portland, OR, USA; August 3 - 8, 2024.

17. Schroeder C, Secrest MH, Kerloeguen Y, Mahrus S. Current trends in the therapeutic management of metastatic prostate cancer in clinical practice. In: *The 40th International Conference on Pharmacoepidemiology & Therapeutic Risk Management* Berlin, Germany; August 24-28, 2024.

18. Secrest MH. An introduction to hybrid control studies and the software tool {psborrow2}. In: *ASA Biopharmaceutical Section Real-World Evidence HHSU01 FDA Grantees Series* Virtual; August 28, 2024.

Open Source Packages

1. psborrow2, an R packages for conducting Bayesian Dynamic Borrowing analyses and other innovative designs. Isaac Gravestock, Matthew H. Secrest.

2. survivalCCW, a light-weight R packages for manipulating data to conduct clone-censor weight analyses. Matthew H. Secrest.