Alind Gupta

Curriculum vitae

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Summary

My work focuses on applied methods for observational data analysis in health outcomes research. I serve as advisor on projects with public and private institutions involving: target trial emulation, quantitative bias analysis, generalizability, treatment policy optimization and risk prediction, and public health interventions for COVID-19 in low- and middle-income countries. I am also leading research initiatives for improving scientific rigour, trust and transparency in real-world evidence for health technology assessment.

Professional experience

2023–pres.	**Adjunct Lecturer**, *Department of Epidemiology, Dalla Lana School of Public Health*, University of Toronto, Toronto
2020–pres.	**Research Principal**, *Cytel Inc*, Toronto
2018–2020	**Research Consultant**, *Lighthouse Outcomes Inc*, Toronto

Education

2013–2018	**PhD**, *University of Toronto*, Toronto
2008–2012	**Hon BSc**, *University of Toronto*, Toronto

Conference/Invited talks

[1] A Gupta. Bias in observational studies and what to do about it. Pharmaceutical Evaluation and Policy seminar, University of Arkansas, September 15, 2023.

[2] A Gupta and A Diop. Assessing the performance of group-based trajectory modelling method to discover patterns of medication adherence. International Conference on Pharmacoepidemiology (ICPE) Annual Conference, Halifax, Nova Scotia, Canada, August 23-27, 2023 (accepted).

[3] Thorlund, K, Shi, J, A Gupta, and S Duffield. The reality of target trial emulation for medical decision-making and HTA recommendations - Is the gap between academic and HTA applications too wide? International Society for Pharmacoeconomics and Outcomes Research (ISPOR) Annual Conference, Boston, Massachussetts, May 7-10, 2023.

[4] S Wilkinson, A Gupta, and Arora, P. Using probabilistic quantitative bias anal-

ysis (QBA) to account for unmeasured confounders when estimating treatment effects in real-world data. Virtual ISPOR, May 17-20, 2021.

[5] Cheung, WY, RN Walton, Mitsakakis, N, and A Gupta. Transparent machine learning and decision-making in HEOR. Virtual ISPOR, May 17-20, 2020.

[6] A Gupta. Bayesian networks as an emerging tool for disease risk estimation and clinical decision-making: A real-world example in coronary artery disease. CADTH Symposium, Edmonton, Canada, April 14-16, 2019.

Publications

[1] Kristian Thorlund, Stephen Duffield, Sanjay Popat, Sreeram Ramagopalan, Alind Gupta, Grace Hsu, Paul Arora, and Vivek Subbiah. Quantitative bias analysis for external control arms using real-world data in clinical trials: a primer for clinical researchers. *Journal of Comparative Effectiveness Research*, (0):e230147, 2023.

[2] Frank Griesinger, Sreeram Ramagopalan, Winson Y Cheung, Thomas Wilke, Sabrina Mueller, Alind Gupta, Dylan E O'Sullivan, Paul Arora, Darren R Brenner, Carolin Froelich, et al. Association between treatment and improvements in overall survival of patients with advanced/metastatic non–small cell lung cancer since 2011: A study in the united states, canada, and germany using retrospective real-world databases. *Cancer*, 2023.

[3] DJ Boyne, DR Brenner, A Gupta, E Mackay, P Arora, R Wasiak, WY Cheung, and MA Hernán. Head-to-head comparison of folfirinox versus gemcitabine plus nab-paclitaxel in advanced pancreatic cancer: a target trial emulation using real-world data. *Annals of Epidemiology*, 78:28–34, 2023.

[4] L Dron, V Kalatharan, A Gupta, J Häggström, N Zariffa, AD Morris, P Arora, and J Park. Data capture and sharing in the COVID-19 pandemic: a cause for concern. *The Lancet Digital Health*, 4(10):e748–e756, 2022.

[5] S Popat, SV Liu, N Scheuer, A Gupta, GG Hsu, SV Ramagopalan, F Griesinger, and V Subbiah. Association between smoking history and overall survival in patients receiving pembrolizumab for first-line treatment of advanced non–small cell lung cancer. *JAMA Network Open*, 5(5):e2214046–e2214046, 2022.

[6] S Popat, SV Liu, N Scheuer, GG Hsu, A Lockhart, SV Ramagopalan, F Griesinger, and V Subbiah. Addressing challenges with real-world synthetic control arms to demonstrate the comparative effectiveness of pralsetinib in non-small cell lung cancer. *Nature Communications*, 13(1):3500, 2022. (Unattributed authorship but I performed analyses for and output figures 2 and 3).

[7] S Ramagopalan, A Gupta, P Arora, K Thorlund, J Ray, and V Subbiah. Comparative effectiveness of atezolizumab, nivolumab, and docetaxel in patients with previously treated non–small cell lung cancer. *JAMA Network Open*, 4(11):e2134299–e2134299, 2021.

[8] S Wilkinson, A Gupta, N Scheuer, E Mackay, P Arora, K Thorlund, R Wasiak, J Ray, S Ramagopalan, and V Subbiah. Assessment of alectinib vs ceritinib in ALK-positive non–small cell lung cancer in phase 2 trials and in real-world data. *JAMA Network Open*, 4(10):e2126306–e2126306, 2021.

     ◦ This paper was showcased as a case study for quantitative bias analysis in real-world evidence framework from National Institute for Health and Care Excellence (NICE): here. Accompanying invited commentary by Julian C. Hong: JAMA Network Open. 2021;4(10):e2128045.

[9] S Nsanzimana, A Gupta, JP Uwizihiwe, J Häggström, L Dron, P Arora, and JJH Park. The need for a practical approach to evaluate the effectiveness of COVID-19 vaccines for low-and middle-income countries. *The American Journal of Tropical Medicine and Hygiene*, 105(3):561, 2021.

[10] A Badawi, CJ Liu, AA Rihem, and A Gupta. Artificial neural network to predict the effect of obesity on the risk of tuberculosis infection. *Journal of Public Health Research*, 10(1):jphr–2021, 2021.

[11] A Gupta, P Arora, D Brenner, J Vanderpuye-Orgle, DJ Boyne, M Edmondson-Jones, E Parkhomenko, W Stevens, S Dudani, DYC Heng, et al. Risk prediction using Bayesian networks: An immunotherapy case study in patients with metastatic renal cell carcinoma. *JCO Clinical Cancer Informatics*, 5:326–337, 2021.

[12] A Dillman, MJ Zoratti, JJH Park, G Hsu, L Dron, G Smith, O Harari, CR Rayner, NE Zannat, A Gupta, et al. The landscape of emerging randomized clinical trial evidence for COVID-19 disease stages: a systematic review of global trial registries. *Infection and Drug Resistance*, pages 4577–4587, 2020.

[13] A Badawi, G Di Giuseppe, A Gupta, A Poirier, and P Arora. Bayesian network modelling study to identify factors influencing the risk of cardiovascular disease in Canadian adults with hepatitis C virus infection. *BMJ Open*, 10(5):e035867, 2020.

[14] A Gupta, JJ Slater, DJ Boyne, N Mitsakakis, A Béliveau, MJ Druzdzel, DR Brenner, S Hussain, and P Arora. Probabilistic graphical modeling for estimating risk of coronary artery disease: applications of a flexible machine-learning method. *Medical Decision Making*, 39(8):1032–1044, 2019.

[15] P Arora, D Boyne, JJ Slater, A Gupta, DR Brenner, and MJ Druzdzel. Bayesian networks for risk prediction using real-world data: a tool for precision medicine. *Value in Health*, 22(4):439–445, 2019.

Conference proceedings

[1] H Ruan, A Springford, A Gupta, and E Mackay. MSR102 Variance-bias trade-off in covariate adjustment in the context of synthetic control methods. volume 25, page S369. Elsevier, 2022.

[2] S Kent, A Gupta, S Duffield, S Popat, J Ray, A Lockhart, M Hernán, and S Ramagopalan. MSR125 Bias adjusting for unmeasured confounders in synthetic control analysis (SCA) estimates of immunotherapy effectiveness in advanced non-small cell lung cancer (aNSCLC): An output from the Q-BASEL study. volume 25, page S374. Elsevier, 2022.

  ○ Part of research collaboration with National Institute for Healthcare Excellence (NICE) and other stakeholders.

[3] A Gupta, S Ramagopalan, D Boyne, DR Brenner, WY Cheung, P Arora, and R Wasiak. POSC299 Transportability analysis: A principled method for transporting treatment effects observed in one real-world dataset to another. volume 25, page S207. Elsevier, 2022.

[4] S Wilkinson, A Gupta, E Mackay, P Arora, K Thorlund, R Wasiak, J Ray, and S Ramagopalan. OP208 Did HTAs make the wrong call? Quantitative bias analysis: Alectinib versus ceritinib in non-small cell lung cancer. volume 37, pages 6–6. Cambridge University Press, 2021.

[5] V Subbiah, A Gupta, J Ray, P Arora, K Thorlund, and S Ramagopalan. 1316P Comparative effectiveness of atezolizumab (Atz) versus docetaxel (Dtx) or nivolumab (Niv) in previously treated (pt) patients with advanced non-small cell lung cancer (aNSCLC): A US real-world (RW) study. volume 32, pages S1012–S1013. Elsevier, 2021.

[6] S Wilkinson, A Gupta, N Scheuer, E Mackay, P Arora, K Thorlund, R Wasiak, J Ray, and S Ramagopalan. RW3 quantitative bias analysis (QBA) for comparative effectiveness of alectinib versus ceritinib in non-small cell lung cancer (NSCLC). volume 24, page S239. Elsevier, 2021.

[7] DJ Boyne, D Brenner, A Gupta, E Mackay, P Arora, R Wasiak, WY Cheung, and M Hernan. Head-to-head comparison of first-line folfirinox versus gemcitabine plus nabpaclitaxel (GN) in advanced pancreatic cancer (APC): A target trial emulation using Canadian real-world data. Wolters Kluwer Health, 2021.

[8] A Gupta, P Arora, D Brenner, M Edmonson-Jones, E Parkhomenko, W Stevens, S Wagner, J Borrill, and E Wu. Application of a machine learning model to predict survival outcomes for patients with advanced renal cell carcinoma (aRCC) treated with nivolumab. In *41st Annual Meeting of the Society for Medical Decision Making*. SMDM, 2019.

[9] A Gupta, J Slater, N Mitsakakis, DJ Boyne, MJ Druzdzel, DR Brenner, and P Arora. PCV99 Bayesian networks as an emerging tool for disease risk estimation and clinical decision-making: A real-world example in coronary artery disease. volume 22, page S136. Elsevier, 2019.

�__ Languages

English	Native or bilingual proficiency
Hindi	Native or bilingual proficiency

Japanese	Limited working proficiency (approx. JLPT N2)
Sanskrit	Limited working proficiency
Spanish	Basic proficiency

Computer skills

Languages	Python, R	*(Past) Haskell, C, C++11, Julia*
Technologies	Git, LaTeX, Microsoft Office Suite	*(Past) MySQL, Stan, Bugs, Docker*

Miscellaneous

2022	Receipient of 2021 Cytel Spotlight award
2021	Invited judge for UofT AI ProjectX
2021	Interviewed for MedPage Today on machine learning for cancer immunotherapy (link)