



A DIVISION OF TOXSTRATEGIES, INC.

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SENIOR EPIDEMIOLOGIST

CONTACT INFORMATION

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PROFESSIONAL PROFILE

Ms. Lauren Bylsma is an epidemiologist in the EpidStrategies division's Ann Arbor office. She has broad experience in conducting research in pharmacoepidemiology; nutritional, cancer, environmental, and occupational epidemiology; and the epidemiology of rare diseases. With a Master of Public Health degree and Certificate in Global Health, Ms. Bylsma conducts systematic reviews and meta-analyses of scientific literature on human health issues ranging from osteoarthritis to vascular disease to various forms of cancer. She has worked as a research assistant on a prospective cohort study evaluating the effects of air pollution on pre-term birth in Mexico City and interned at the Universidad Nacional Autónoma de México in Mexico City managing nutritional data and analyzing fetal growth effects of maternal dietary patterns.

Ms. Bylsma taught an integrative capstone seminar in the Department of Public Health at Calvin College and has presented work at conferences across research settings, including the American Society of Hematology, European Society for Medical Oncology, Experimental Biology, and International Society for Pharmacoeconomics and Outcomes Research.

EDUCATION AND DEGREES EARNED

- 2013 Master of Public Health, Epidemiology; Certificate in Global Health
University of Michigan School of Public Health, Ann Arbor
- 2011 Bachelor of Science, Biology
Calvin College, Grand Rapids, Michigan

PROFESSIONAL HONORS/AWARDS

2011–2013 Dean's Award, School of Public Health, University of Michigan

PROFESSIONAL ASSOCIATIONS

2017–Present International Society for Pharmacoepidemiology

SELECTED PROFESSIONAL EXPERIENCE

Managed systematic literature reviews for topics including osteoarthritis, vascular access efficacy and safety outcomes, second-line treatments of non-small-cell lung cancer, mutation prevalence in metastatic colorectal cancer, use of thrombopoietin receptor agonists in chemotherapy-induced thrombocytopenia, and second-line therapies in immune thrombocytopenic purpura.

Estimated incidence and prevalence of various chronic conditions and cancers for epidemiology sections of regulatory submissions of orphan drug applications.

Used SEER and census-tract data to evaluate historical cancer incidence and mortality in a community near a former manufactured gas plant. Also used SEER data, along with scientific literature, to predict future numbers of U.S. patients with metastatic colorectal cancer that undergo surgical resections.

Performed a systematic literature review and conducted indirect treatment comparisons with relevant comparator drugs in lieu of head-to-head trials for pharmaceutical approval.

Assisted in a meta-analysis of the association between red and processed meats and multiple cancer sites for review by the International Agency for Research on Cancer.

As a research associate, performed extensive literature reviews, summarizing and critiquing available epidemiologic literature on environmental and occupational exposures, particularly air pollutants and pesticides, and their associations with various diseases and malignancies.

During graduate work, contributed to the Air Pollution and Birth Outcomes Study, a prospective cohort of approximately 1000 pregnant women in Mexico City, Mexico. Supervised data entry, cleaning, and management, and translated data collection forms into Spanish.

Also worked with the Air Pollution and Birth Outcomes Study as an intern in Mexico City. Created a database and bilingual data dictionary and designed and performed analysis on the Spanish-language Food Frequency Questionnaire used in the study.

Performed microbiological laboratory research on biofilm bacteria, particularly *Staphylococcus aureus*, and their ability to evade host-cell defense mechanisms. Conducted various experiments with bacterial growth assays, protein purification, and binding assays. Worked with standard biological research technology: flow cytometer, spectrophotometer, fluorescent spectrophotometer, SDS-PAGE, and agarose-gel electrophoresis.

At the Calvin College Department of Public Health, taught a semester-long course—"Integrative Seminar in Public Health"—for upper classmen in preparation for work in the field of public health. Course highlighted current topics and challenges in the five major areas of public health: biostatistics, epidemiology, health policy, health education, and environmental health.

JOURNAL PEER REVIEWER

Journal of Medical Economics

Kidney Medicine

MANUSCRIPTS

Levin-Sparenberg E, **Bylsma LC**, Lowe K, Sangare L, Fryzek JP, Alexander DD. 2020. A systematic literature review and meta-analysis describing the prevalence of KRAS, NRAS, and BRAF gene mutations in metastatic colorectal cancer. *Gastroenterol Res* 13(5):184–198. doi: 10.14740/gr1167.

Suh M, Jiang X, Mowva N, Fryzek J, **Bylsma L**, Rizzo C, Nelson CB. Hospitalizations and emergency department visits for respiratory syncytial virus among infants aged <1 year in the United States: An analysis of nationwide inpatient and emergency room data. Presentation to IDWeek virtual conference on infectious disease, October 2020.

Saldanha G, Ording AG, **Bylsma LC**, Darvalics B, Solis D, Tang JY, Sorensen HT, Fryzek J. 2020. High-frequency basal cell carcinoma in Danish patients: Prevalence and consistency. *J Eur Acad Dermatol Venereol* [Early View], <http://dx.doi.org/10.1111/jdv.16512>.

Su J, **Bylsma LC**, Jiang X, Morales Arias J, Jain N, Nordyke RJ. 2020. Healthcare resource utilization among commercially insured patients with cold agglutinin disease in the United States. *J Med Econ*, DOI: 10.1080/13696998.2020.1764006 [e-pub ahead of print].

Stalbovskaya V, Wasserman E, Fryzek J, **Bylsma L**, Sirulnik A. 2020. NRG1 fusion-driven cancers: A systematic literature review and meta-analysis. Abstract in proceedings from annual meeting of the American Society of Clinical Oncology, May 2020.

Broome CM, Cunningham JM, Mullins M, Jiang X, **Bylsma LC**, Fryzek JP, Rosenthal A. 2020. Increased risk of thrombotic events in cold agglutinin disease: A 10-year retrospective analysis. *Res Prac Thrombosis Haemostasis*, open access: <https://doi.org/10.1002/rth2.12333>.

Bylsma LC, Gillezeau C, Garawin TA, Kelsh MA, Fryzek JP, Sangaré L, Lowe KA. 2019. Prevalence of RAS and BRAF mutations in metastatic colorectal cancer patients by tumor sidedness: A systematic review and meta-analysis. *Cancer Med* Dec 19, doi: 10.1002/cam4.2747.

Bylsma LC, Reichert H, Gage SM, Roy-Chaudhury P, Nordyke RJ, Fryzek J, Dahl SLM, Lithgow T, Lawson JH. 2019. Clinical outcomes of arteriovenous access in incident hemodialysis patients with Medicare coverage, 2012–2014. *Am J Nephrol* 49(2):156–164, doi: 10.1159/000495355. Epub Jan 24.

Bylsma LC, Ording AG, Rosenthal A, Öztürk B, Fryzek JP, Arias JM, Röth A, Berentsen S. 2019. Occurrence, thromboembolic risk, and mortality in Danish patients with cold agglutinin disease. *Blood Advances* 3(20):2980–2985.

Bylsma LC, Dean R, Lowe K, Sangaré L, Alexander DD, Fryzek JP. 2019. The incidence of infusion reactions associated with monoclonal antibody drugs targeting the epidermal growth factor receptor in metastatic colorectal cancer patients: A systematic literature review and meta-analysis of patient and study characteristics. *Cancer Med* 8(12):5800–5809. Open access: <https://doi.org/10.1002/cam4.2413>.

Nordyke RJ, Reichert H, **Bylsma LC**, Jackson JJ, Gage SM, Fryzek J, Roy-Chaudhury P, Lithgow T. 2019. Costs attributable to arteriovenous fistula and arteriovenous graft placements in hemodialysis patients with Medicare coverage. *Am J Nephrol* [Online first, abstract only]: doi: 10.1159/000502507, <https://www.karger.com/Article/Abstract/502507#>.

Bylsma LC, Dean RGK, Lowe K, Sangare L, Alexander D, Fryzek J. 2019. The incidence of infusion reactions associated with monoclonal antibody drugs targeting the epidermal growth factor receptor in metastatic colorectal cancer patients: A systematic literature review and meta-analysis of patient and study characteristics. *Cancer Med* Aug 3, doi: 10.1002/cam4.2413 [Epub ahead of print]. Available at <https://onlinelibrary.wiley.com/doi/10.1002/cam4.2413>.

Su J, **Bylsma LC**, Jiang X, Morales Arias J, Jain N, Nordyke RJ. Healthcare resource utilization among commercially insured cold agglutinin disease patients in the United States. Poster presentation at International Society for Pharmacoeconomics and Outcomes Research, New Orleans, Louisiana, May 18–22, 2019.

Bylsma LC, Reichert H, Gage SM, Roy-Chaudhury P, Nordyke RJ, Fryzek J, Dahl SLM, Lithgow T, Lawson JH. 2018. Maturation, sustained use, and abandonment of arteriovenous fistula and arteriovenous graft placements in hemodialysis patients with Medicare coverage, 2012–2014. *Am J Nephrol* (in press).

Bylsma LC, Fryzek JP, Cetin K, Callaghan F, Bezold C, Mehta B, Wasser JS. 2018. Systematic literature review of treatments used for adult immune thrombocytopenia (ITP) in the second-line setting. *Am J Hematol* Sep 28 [Epub ahead of print].

Beebe-Dimmer JL, Ruterbusch JJ, **Bylsma LC**, Gillezeau C, Fryzek J, Schultz NM, Flanders SC, Barlev A, Heath E, Quek RGW. 2018. Patterns of bicalutamide use in prostate cancer treatment: A U.S. real-world analysis using the SEER-Medicare Database. *Adv Ther* Jun 26. [Epub ahead of print].

Schwartz K, Simon MS, **Bylsma LC**, Ruterbusch JJ, Beebe-Dimmer JL, Schultz NM, Flanders SC, Barlev A, Fryzek JP, Quek RGW. 2018. Clinical and economic burden associated with stage III-IV triple negative breast cancer: A SEER-Medicare historical cohort study. *Cancer* 124(10):2104–2114.

Mullins M, Jiang X, **Bylsma LC**, Fryzek JP, Reichert H, Chen EC, Kummur S, Rosenthal A. 2017. Cold agglutinin disease burden: A longitudinal analysis of anemia, medications, transfusions, and healthcare utilization. *Blood Adv* 1(13):839–848.

Bylsma LC, Gage SM, Reichert H, Dahl SLM, Lawson JH. 2017. Arteriovenous fistulas for hemodialysis: A systematic review and meta-analysis of efficacy and safety outcomes. *Eur J Vasc Endovasc Surg* 54(4):513–522.

Alexander DD, Miller PE, Van Elswyk M, Kuratko CN, **Bylsma LC**. 2017. A meta-analysis of randomized controlled trials and prospective cohort studies of eicosapentaenoic and docosahexaenoic long chain omega-3 fatty acids and coronary heart disease risk. *Mayo Clinic Proceedings* 92(1):15–29.

Alexander DD, Yan J, **Bylsma LC**, Northington RS, Grathwohl D, Steenhout P, Erdmann P, Spivey-Krobath E, Haschke F. 2016. Growth of infants consuming whey-predominant term infant formulas with a protein content of 1.8 g/100 kcal: A multi-center pooled analysis of individual participant data. *Am J Clin Nutr* 104(4):1083–1092.

Alexander DD, **Bylsma LC**, Elkayam L, Nguyen DL. 2016. Nutritional and health benefits of semi-elemental diets: A comprehensive summary of the literature. *World J Gastrointest Pharmacol Ther* 7(2):306–319.

Alexander DD, **Bylsma LC**, Vargas AJ, Cohen SS, Doucette A, Mohamed M, Irvin SR, Miller PE, Watson HW, Fryzek JP. 2016. Dairy consumption and cardiovascular disease: A systematic review and meta-analysis. *Br J Nutr* 115(4):737–750.

Bylsma LC, Alexander DD. 2015. A review and meta-analysis of prospective studies of red and processed meat, meat cooking methods, heme iron, heterocyclic amines and prostate cancer. *Nutr J* 14(1):125.

Alexander DD, Jiang X, **Bylsma LC**, Garabrant DH, Irvin SR, Fryzek JP. 2014. Historical cancer incidence and mortality assessment in an Illinois community proximal to a former manufactured gas plant. *BMJ Open* 4:e006713.

ABSTRACTS AND PRESENTATIONS

Suh M, Movva N, Fryzek J, **Bylsma L**, Rizzo C, Nelson CB. Systematic literature review of historical and current respiratory syncytial virus (RSV) clinical testing policy and practice in the United States. IDWeek virtual conference on infectious disease, October 2020.

Suh M, Movva N, Fryzek J, **Bylsma L**, Rizzo C, Nelson CB. Systematic literature review of historical and current respiratory syncytial virus (RSV) clinical testing policy and practice in the United States. IDWeek virtual conference on infectious disease, October 2020.

Stalbovskaya V, Wasserman E, Fryzek J, **Bylsma LC**, Sirulnik A. NRG1 fusion-driven cancers: A systematic literature review and meta-analysis. Abstract poster presentation at National Organization for Rare Disorders Summit, October 2020 [virtual conference due to COVID-19].

Stalbovskaya V, Wasserman E, Fryzek J, **Bylsma LC**, Sirulnik A. NRG1 fusion-driven cancers: A systematic literature review and meta-analysis. Abstract presented online at American Society of Clinical Oncology, May 2020 [virtual conference due to COVID-19].

Bylsma LC, Dean R, Lowe K, Sangare L, Alexander D, **Fryzek J**. The incidence of infusion reactions associated with monoclonal antibody drugs targeting the epidermal growth factor receptor in metastatic colorectal cancer patients: A systematic literature review and meta-analysis of patient and study characteristics. Poster for Society of Toxicology, virtual annual meeting, 2020, <https://eventpilotadmin.com/web/page.php?page=Session&project=SOT20&id=P3205>.

Bylsma LC, Saldanha G, Gulbech Ording A, Darvalics B, Tang J, Tof Sorensen H, Fryzek J. Cohort study of high frequency basal cell carcinoma (BCC) patients in Denmark. Poster presented at National Organization for Rare Disorders (NORD) Summit, October 2019, Washington, D.C.

Bylsma LC, Dean R, Lowe K, Sangare L, Alexander D, Fryzek J. The incidence of infusion reactions associated with monoclonal antibody drugs targeting the epidermal growth factor receptor in metastatic colorectal cancer patients: A systematic literature review and meta-analysis. Poster presented at the International Society for Pharmacoepidemiology, August 2019, Philadelphia, PA.

Bylsma LC, Levin-Sparenberg E, Lowe K, Sangare L, Fryzek J, Alexander DD. Prevalence of KRAS, NRAS, and BRAF gene mutations in metastatic colorectal cancer (MCRC) patients: A systematic literature review and meta-analysis. Poster presented as part of a Spotlight Poster Session at the International Society for Pharmacoepidemiology, August 2019, Philadelphia, PA.

Fryzek J, **Bylsma LC**, Nordyke RJ, Sorensen HT. Rare disease epidemiology: A Danish population-based program. Poster presented at the International Society for Pharmacoepidemiology, August 2019, Philadelphia, PA.

Su J, **Bylsma LC**, Jiang X, Morales Arias J, Jain N, Nordyke RJ. Healthcare resource utilization among commercially insured cold agglutinin disease patients in the United States. Poster presented at the International Society for Pharmacoepidemiology and Outcomes Research, May 2019, New Orleans, LA.

Saldanha G, Gulbech Ording A, **Bylsma LC**, Darvalics B, Tang J, Tof Sorensen H, Fryzek J. Cohort study of high frequency basal cell carcinoma (BCC) patients in Denmark. Poster presented at the Society for Investigative Dermatology, May 2019, Chicago, IL.

Lowe K, **Bylsma LC**, Dean R, Gillezeau C, Sangaré L, Alexander DD, Fryzek J. The incidence of infusion reactions associated with monoclonal antibody drugs targeting the epidermal growth factor receptor in metastatic colorectal cancer patients: A systematic literature review and meta-analysis. Poster presentation at Gastrointestinal Cancers Symposium, San Francisco, California, January 2019.

Lowe K, **Bylsma LC**, Levin-Sparenberg ED, Sangaré L, Fryzek J, Alexander DD. Prevalence of KRAS, NRAS, and BRAF gene mutations in metastatic colorectal cancer patients: A systematic literature review and meta-analysis. Poster presentation at Gastrointestinal Cancers Symposium, San Francisco, California, January 2019.

Fryzek JP, **Bylsma LC**, Nordyke RJ, Sorensen HT. Rare disease epidemiology: A Danish population-based program. Poster presented at National Organization for Rare Disorders' Rare Disease and Orphan Products Breakthrough Summit, Washington, D.C., October 2018.

Bylsma, LC, Gulbech Ording A, Froslev T, Mehnert F, Fryzek JP, Morales Arias J, Roth A, Sorensen HT, Berentsen S. Occurrence, survival, and thromboembolic risk in cold agglutinin disease: A population-based cohort analysis. Presented at 23rd Congress of the European Hematology Association, Stockholm, Sweden, June 2018.

Reichert H, Fryzek J, **Bylsma LC**. Survival synthesis: Methods for meta-analysis of survival rates and aggregation of survival data. Poster, 12th International Conference on Health Policy Statistics, Charleston, SC, January 2018.

Bylsma LC, Gillezeau C, Garawin T, Kelsh M, Fryzek J, Sangare L, Lowe KA. Prevalence of RAS and BRAF mutations in metastatic colorectal cancer (mCRC) patients by tumor location. Poster presentation at Gastrointestinal Cancers Symposium, January 2018.

Broome C, Cunningham JM, Mullins M, ·Jiang X, **Bylsma L**, Fryzek J, Rosenthal A. Incidence of thromboembolic events is increased in a retrospective analysis of a large cold agglutinin disease (CAD) cohort. Presented at American Society of Hematology, Atlanta, GA, December 2017.

Soff GA, Ray-Coquard I, Marfil Rivera LJ, Fryzek J, Mullins M, **Bylsma LC**, Park JK. Literature review of thrombopoietin receptor agonists (TPO-RA) for chemotherapy-induced thrombocytopenia (CIT). Presented at European Society for Medical Oncology, Madrid, Spain, September 2017.

Ruterbusch JJ, **Bylsma LC**, Barlev A, Flanders S, Schultz NM, Fryzek J, Quek RG, Health EI, Beebe-Dimmer JL. Bicalutamide treatment patterns in elderly prostate cancer patients: A historical cohort study using the Surveillance, Epidemiology and End Results Program (SEER)-Medicare database. Poster presented at International Society for Pharmacoeconomics and Outcomes Research, Boston, MA, May 2017.

Cetin K, Callaghan F, Fryzek J, **Bylsma L**, Bezold C, Mehta B. EHA-1847. Safety and efficacy/effectiveness of second-line treatments in patients with immune thrombocytopenia: A systematic review of the literature. 21st Congress of the European Hematology Association, Copenhagen, Denmark, June 2016.

Cetin K, Callaghan F, Fryzek J, **Bylsma L**, Bezold C, Mehta B. Safety and efficacy/effectiveness of 2nd-line treatments in immune thrombocytopenia (ITP): A systematic review of the literature. 32nd International Conference on Pharmacoepidemiology & Therapeutic Risk Management, Dublin, Ireland, August 2016.

Cetin K, Callaghan F, Fryzek J, **Bylsma L**, Bezold C, Mehta B. Safety and efficacy/effectiveness of second-line treatments in patients with immune thrombocytopenia: A systematic review of the literature. 3rd Biennial Summit of the Thrombosis & Hemostasis Societies of North America, Chicago, IL, April 2016.

Bylsma LC, Alexander DD. A review and meta-analysis of prospective studies of red and processed meat, meat cooking methods, heme iron, heterocyclic amines and prostate cancer. Presented at Experimental Biology Conference, San Diego, CA, April 2016.

Miller PE, **Bylsma LC**, Alexander, DD. A review and meta-analysis of red meat consumption and type 2 diabetes. Poster presented at Experimental Biology Conference, Boston, MA, March 2015.

Heyding RA, **Bylsma LC**, Craddock H, Gard A, Miller LR, Walsh AR. Parental trust in health information sources and influenza vaccination in children. Poster presented at The Council of State and Territorial Epidemiologists Annual Conference, Pasadena, CA, June 2013.

Bylsma LC, O'Neill MS, Castillo-Castrejón M, Vadillo-Ortega F. Characterization of diet and dietary exposures to genotoxic compounds in pregnant women of Mexico City. Poster presented at UMSPH Epidemiology Poster Session and UM Student Global Health Day, Ann Arbor, MI, November 2012.

Bylsma LC, Hoogewerf A. Role of a copper ATPase in the IL-1 β -induced growth of *S. aureus* biofilms. Poster presented at Western Michigan Undergraduate Research Conference, Van Andel Institute, Grand Rapids, MI, October 2010.