Dr. Mithilesh Dronavalli

Medical Data Scientist



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Google Scholar



Pubmed

My goal is to help prevent and alleviate suffering for the sickest, poorest, and most vulnerable people through research and discovery. I try to focus on mental health research for the socially disadvantaged.

I have 9 years of experience applying machine learning and biostatistics to clinical/public health research (27 articles on PubMed +700 citations) and 4 years of experience in clinical psychiatry, where I treated patients. I have general medical registration with AHPRA

My research includes the areas of poverty, crime, social disadvantage, prenatal drug abuse, prematurity, children with disabilities, mental health, out-of-home care, addiction, Aboriginal Health, communicable diseases, cancer, heart disease, smoking cessation, breastfeeding, health and well-being, health education and aged care.

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Education

PhD - Data Science (Mental Health Services and Social Disadvantage)

Western Sydney University

October 2022 to September 2025

Evaluating Mental Health Services for the Socially Disadvantaged including constructing Simulation Models in AnyLogic

Evaluating the effectiveness of GP care plans in reducing metabolic risk for patients with serious mental illness. Predictors and outcomes of change in socio-economic position over time and ensuing patterns of illness and receiving treatment.

MPhil in Cancer Epidemiology

University of Sydney, NHMRC Clinical Trial Centre

June 2007 to September 2011

Risk and Treatment Factors of Squamous Cell Carcinoma of the Lip

Masters of Biostatistics

Monash University

January 2007 to June 2008

Training in Public Health Medicine

Australian Faculty of Public Health Medicine

Rotations: Rural and Indigenous Health, HIV, Public Health Unit (Communicable Disease and Environmental Health), Childhood Disability, Addiction and Pharmacoepi (TGA)

Coursework: Environmental Health Risk Assessments | Framing Indigenous Health | Health Promotion | Health Policy | Epidemiology and Control of Communicable Disease | Qualitative Research Methods | Environmental Health Risk Assessments | Introduction to teaching and supervision | Grant Writing | PRINCE 2: Foundations and Practitioners | Good Clinical Practice (GCP) Certified as of 2022 Oct

MBBS BMedSc

University of Melbourne

January 2002 to December 2010

Honours Thesis: A Pharmacological mechanism for the Clinical Benefits of Angiotensin Converting Enzyme Inhibitors: Analyses of randomised controlled trials

High School Certificate

Fort St Selective High School

2001

Taught me broad content and diverse perspectives in a multicultural environment and how to LEARN and THINK.

Experiences

Medical Biostatistician

Western Sydney University - Since May 2022

- Perinatal Drug Exposure, prematurity and inhaled nitric oxide treatment, bronchopulmonary dysplasia, unsupervised clustering of neonatal ICU infants and short-term/long-term outcomes/cost to health services/education /, out-of-home care outcomes and service utilisation for babies and their mothers. Results of a population birth cohort 'Joining the Dots' of 1.8 million babies and their mothers in NSW between 2001 and 2020. Methods focused on causal mediation analysis.
- Supervising Clinicians and Honours Research Students as a Medical Statistician and co-supervisor. Two of my honours students were Gold Medallists in their seminar series.

In-house Lead Biostatistician

Ingenu CRO - September 2022 to September 2023

For Phase 1 and Early Phase 2 Studies in neuroleptic/psychotropic/analgesic medication with a focus on psychedelics:

Statistical Analysis Plans

Data Analysis

Randomisation Schedule

Sample Size Calculations

Innovation in Data Related Planning and Tasks Advising Sponsors in Sponsor Meetings

Pharmacoepidemiologist

Therapeutic Goods Administration - September 2021 to April 2022

Approving and Regulating Medical Devices

Senior Public Health Medicine Registrar in Communicable Diseases (Sydney COVID Lockdown)

Liverpool Public Health Unit - March 2021 to September 2021 - Australia

- Leading the external communications team for answering questions from the public regarding the Sydney COVID Lockdown
- > Leading a team in the management of Adverse Effects following Immunisation for COVID
- ▶ Contributing to the containment of a COVID outbreak in Lockdown
- As an Investigator, designing and overseeing a real world implementation RCT of Co-designed Universal Micro-messaging Health Education Videos for Breastfeeding in Rural Mothers in South Africa.

Research Fellow (Biostatistics)

National Drug and Alcohol Research Centre (WHO Collaborating Research Centre), UNSW - January 2020 to December 2020 - Sydney

- Investigating the role of Social Disadvantage in Criminal Trajectories of those using Drugs as the index offence.
- > Evaluation of an Aboriginal Cultural Competency Program for non-Aboriginal Drug Rehabs
- Supervising an Aboriginal PhD Student in research for a Continuous Quality Improvement of Aboriginal Residential Drug Rehabs
- RCT Evaluating Health Education Videos for Breastfeeding delivered by "Mentor Mothers" for Poor Mothers in South Africa. In collaboration with Stanford University and Heidelberg University

Medical Biostatistician and Public Health Medicine Registrar

Liverpool Hospital - February 2019 to January 2020 - Sydney

- Assessing the effectiveness of oseltamivir prophylaxis in preventing Influenza outbreaks in Aged Care Facilities.
- > Estimating Childhood Disability in Southwest Sydney and advocating a state-wide Child Disability Register
- Outbreak Control (eg Measles; Gastro in a school, child care or aged care facility; Influenza in an Aged Care Facility)
- Educating district aged care facility managers ad nursing staff on managing and preventing the spread of influenza outbreaks in a one day teaching session
- ▶ Environmental Health Risk Assessments (PFAS, M12 noise and vibration, Establish Surveillance for Lead Notification with a high-risk Lead Battery Manufacturer, Mercury in Fish)
- Speeding up the management of Syphilis notification through automating repetitive data entry tasks using R and Adobe Optical Character Recognition for data extraction and processing.
- Teaching and upskilling staff in research methods and assisting the Medical Epidemiologist in reporting and surveillance work (Annual STI report | Published Meta-Analysis of Gonorrhoea prevalence and antibiotic resistance for studies in the past 30 years in Australia and New Zealand)
- > Assessing the need for screening for Latent Tuberculosis Infection for refugee children under 2 years

Psychiatry Registrar

North Shore Psychiatry Training Network - September 2016 to October 2018 - Sydney

- ▶ Worked in a high turn over Psychiatric Emergency Care Centre attached to an Emergency Department.
- ▶ Worked in Addiction Dual Diagnosis, Old Age Psychiatry and Child Psychiatry.
- ullet Completed 3 year Education Program in Psychiatry at the Brain and Mind Research Institute
- Completed the Opioid Substitution Treatment Accreditation Course

Pharmacoepidemiologist

Therapeutic Goods Administration - July 2016 to September 2016 - Canberra

Systematic Review, Meta Analysis and Safety Filter

Medical Biostatistician

The Albion Centre - (WHO Collaborating Research Centre) - February 2016 to July 2016 - Sydney

- HIV research and gaining exposure to HIV medicine as well as training and enabling staff in research methods.
- ▶ HIV Complexity Described the increasing burden of comorbidities in patients with HIV, where care needs a multi-disciplinary team approach. Used directed acyclic graphs.
- ▶ HIV Smoking Audit Predicting which patients will benefit most from a smoking cessation intervention
- ▶ Completed the HIV Prescriber Course

Medical Biostatistician

Western Australian Centre for Rural Health, University of Western Australia - November 2014 to January 2016 - Geraldton

- ▶ Systematic Review as the first author to assess measurement tools of general health and wellbeing.
- ▶ Commissioned review of Sexual Health Services in Western Australia by the Department of Health in a team.
- Designed and Delivered Seminars: 1. Understanding and Evaluating Advanced Quantitative Methods 2. Use
 of Social Media for Public Health
- Co-ordinating principal investigator on a complex GP Audit of patients with Acute Coronary Syndrome after discharge from hospital
- National Finalist for Gerry Murphy Prize at RACP Congress

Psychiatry Registrar

Top End Mental Health Services - January 2014 to November 2014 - Darwin

- Worked in Psychiatry treating Aboriginal People with mental illness from remote areas.
- Took the history and mental state of patients and liaised with the multidisciplinary team. Prescribed medication, performed on-call duties, did ECT under supervision
- > Taught Medical students about psychiatry regularly by teaching them psychiatric theory and interview skills

Research Fellow (Pharmacoepidemiology)

NCEPH, ANU and TGA - July 2012 to December 2012

- ▶ Developed a Quantitative Data Analysis Plan for the 45 and Up study in the pharmacoepidemiology field.
- ▶ Investigated a New Indication for a cholesterol-lowering agent.

Psychiatry Registrar

Cumberland Hospital - January 2012 to June 2012

- Worked empathically under pressure, Treated quite severe mental illness
- Caring for mentally ill patients under consultant psychiatrist supervision
 o Elicit History and Mental State to adjust medication. o Communicate with the multidisciplinary team and
 family+carers of the patient. o Clozapine and Outpatient Clinics

Medical Internship

Westmead Hospital - January 2011 to January 2012

Unique Achievements and Expertise

Leadership

- ▶ I led a 15-member team to give advice to the public and key stakeholders related to COVID, and adverse event reporting for the COVID vaccine in the Sydney COVID LOCKDOWN.
- President of the Sydney Northern District Table Tennis Association including, 520 players, 70 teams, 15 clubs. This includes working with the committee, improving processes, uploading scores to a global server using code and organising events.

Data Science Skills(Masters in Biostatistics, First Class Honours, MPhil and PhD)

- Degree Related: Honours first class was on mining cardiovascular clinical RCTs using estimation and prediction to generate surrogate markers using clinical data. My Masters of Biostatistics, MPhil and PhD has taught me a broad range of statistical methods and the application of these methods in biostatistics, machine learning and simulation modelling.
- Statistical Techniques: Biostatistics: Generalized Linear Models, Survival Analysis, Longitudinal and Correlated Data (including multi-level modeling), Advanced R, Stata, Meta-regression, Study Design, Sample Size Calculation, Logic, Variable Selection, Data Linkage, Clinical Trial Design, Probability & Statistical Inference, Pharmacoepidemiology, generating and simulating data, multiple imputation for analysis with missing data and Machine Learning: Random Forest, Longitudinal K-means, SVM, KNN, Classification and Regression Trees, Linear and generalised models for prediction, Causal Inference: Directed Acyclic Graphs, Propensity Scores, Inverse Probability Treatment Weights, Regression Discontinuity, Differences in Differences, Instrumental Variables, Mendelian Randomisation, Causal Mediation Analysis (incl. sensitivity analysis, time to event, multiple mediators) AnyLogic: Agent Based Simulation, Discrete Events and System Dynamics
- ▶ Data: I am an expert programmer in R and Stata, and I write reproducible, well-structured and code with comments. I have attended introductory courses in Python and also SAS. I have carried out data management at the population level, 1.8 million records level with six different routinely collected government datasets of all babies and their mothers in the last 20 years in the state of NSW in Australia totalling over 20Gb)
- ▶ Experience: I have applied almost all of these techniques in my work leading to publications or significant government reports with myself as the statistical author. I have published many articles and reports, including eighteen PubMed publications. 8 years of statistical consulting, data management, analysis, reporting and publication of results.
- Ongoing Learning: I supervise research students and teach statistical methods. I have learned and used new statistical techniques independently, including causal mediation analysis. I am trained in and have experience in machine learning techniques such as Random Forest and k-means longitudinal analysis (kml). I have worked for TGA reviewing clinical study reports for approval of and safety of medical devices.
- Statistical Consulting: I conceptualise and crystallise processes in data capture, data management, reporting and publication as well as consultation with the clients. I understand their requirements and also offer them innovative medical, public health and statistical advice. Developing and optimising protocols using critical appraisal, the literature, and the principles of excellent, scientifically valid, and relevant study designs. Constructed many Statistical Analysis Plans with client consultation.
- Supervision / Teaching: Supervised Honours Students (5), PhD Students (1), clinicians (3), researchers.
 Taught seminars and tutored in biostatistics
- AStat (Accredited Statistician) fro the Statistical Society of Australia in Dec 2022: Member Profile:
 https://www.statsoc.org.au/Sys/PublicProfile/48202292/4702721
 Criteria for Accredited Statistician: Degree in Statistics + 6 years of progressively advanced Statistical Experience + Submission of Major Works + Maintaining Continual Professional Development + 5 year re-accreditations

Conferences

National Rural Health (Oral) 2015 | Asia Pacific Heart Failure (2 Posters) 2008 | RACP 2016 (Oral: Gerry Murphy Prize) | Australian Public Health 2019 (Oral)

Workshops

UN Datathon (Education Track): https://youtu.be/QwGhcoJ17JY?si=rvDXc9BLkWMtpBhd

Major Works (27 Pub Med Publications) +700 Google Scholar citations, hindex: 10, i10-index: 10

- ORCID-ID: https://orcid.org/0000-0002-5084-5023
- ▶ PubMed: https://pubmed.ncbi.nlm.nih.gov/?term=Dronavalli%2C+M
- ▶ https://youtu.be/sOhtbcO0sSQ My Public Lecture on Causation
- Lawler K, Dronavalli M, Uebel H, et al. (2025) Association between out-of-home care and mortality in children with prenatal drug exposure: a retrospective population-based cohort study. Archives of Disease in Childhood. Epub ahead of print 20250331. doi: http://doi.org/10.1136/archdischild-2025-328474.
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 be screening? A systematic review and meta-regression analysis. Journal of Paediatrics and Child Health,
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