

MUHAMMAD MAAZ

1 CONTACT INFORMATION

Institution Faculty of Medicine
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2 EDUCATION

M.D./Ph.D., University of Toronto Sept 2020 – May 2028
B.H.Sc., McMaster University Sept 2016 – May 2020
Honors. Summa cum laude (GPA 3.96/4.0)
Minor. Economics
Thesis. Matching with compatibility constraints: The case of the Canadian Medical Residency Matching Service

3 PUBLICATIONS, PRESENTATIONS AND ABSTRACTS

3.1 Articles, Peer Reviewed

1. **Maaz M**, Papanastasiou A, Ruffle BJ, Zheng A. Heterogeneity in the support for mandatory masks unveiled. Submitted. 2021.
2. **Maaz M**. Saturating stable matchings. Submitted. 2020.
3. **Maaz M**, Papanastasiou A. Matching with compatibility constraints: The case of the Canadian medical residency match. *Journal of Mechanism and Institution Design*. 2020 Dec;5(1):99-117.
4. **Maaz M**, Papanastasiou A. Determining the optimal capacity and occupancy rate in a hospital: a theoretical model using queuing theory and marginal cost analysis. *Managerial and Decision Economics*. 2020 Oct;41(7):1305-1311.
5. **Maaz M**. A primer on the game theory behind the National Resident Matching Program for the medical educator and student. *Medical Science Educator*. 2020;30:965-969.
6. **Maaz M**, Dobbs G. Predicting Depression using Longitudinal Health Survey Data: Machine Learning vs Linear Regression. Submitted. 2019.
7. Kennedy C, Thabane L, Veroniki A A, Adachi R, Richardson J, Cameron I, Giangregorio A, Petropoulou M, Alsaad S, Alzahrani J, **Maaz M**, Ahmed MM, Kim E, Tehfe H, Dima R, Sabanayagam K, Hewston P, Alrob H, Papaioannou A. Management of frailty: A Systematic Review and Network Meta-analysis of Randomized Controlled Trials. *Journal of the American Medical Directors Association*. 2019;20(10):1190-8.

8. Li G, Abbade LP, Nwosu I, Jin Y, Leenus A, **Maaz M**, Wang M, Bhatt M, Zielinski L, Sanger N, Bantoto B. A systematic review of comparisons between protocols or registrations and full reports in primary biomedical research. *BMC Medical Research Methodology*. 2018 Dec;18(1):9.
9. Wang M, Sun G, Chang Y, Jin Y, Leenus A, **Maaz M**, Li G, Bhatt M, Abbade LP, Nwosu I, Zielinski L. A systematic survey of control groups in behavioral and social science trials. *Research on Social Work Practice*. 2018 Jul;28(5):538-45.
10. Jin Y, Sanger N, Shams I, Luo C, Shahid H, Li G, Bhatt M, Zielinski L, Bantoto B, Wang M, Abbade LP, Nwosu I, Leenus A, Mbuagbaw L, **Maaz M**, Chang Y, Sun G, Levine MA, Adachi JD, Thabane L, Samaan Z. Does the medical literature remain inadequately described despite having reporting guidelines for 21 years?—A systematic review of reviews: an update. *Journal of multidisciplinary healthcare*. 2018;11:495.
11. Li G, Abbade LP, Nwosu I, Jin Y, Leenus A, **Maaz M**, Wang M, Bhatt M, Zielinski L, Sanger N, Bantoto B. A scoping review of comparisons between abstracts and full reports in primary biomedical research. *BMC Medical Research Methodology*. 2017 Dec;17(1):181.

3.2 Abstracts and Presentations at Scientific Meetings, Peer Reviewed

1. **Maaz M**. An analysis of occupancy rates in hospitals: results from a cost-minimization model. Oral presentation at: Atlantic Canada Economics Association Conference, Université de Moncton. 2019 Oct 18; Moncton, NB.

3.3 Publications, Non Peer Reviewed

1. **Maaz M**. Viability of machine learning to reduce workload in systematic review screenings in the health sciences: a working paper. arXiv preprint arXiv:1908.08610. 2019 Aug 22.

3.4 Abstracts and Presentations, Non Peer Reviewed

1. **Maaz M**. Addiction: integrating the medical and economic perspectives. Oral presentation at: Department of Economics workshop, McMaster University. 2020 Nov 11; virtual.
2. **Maaz M**. An analysis of occupancy rates in hospitals: results from a cost-minimization model. Poster presented at: Faculty of Health Sciences Poster Day, McMaster University. 2019 Apr 2; Hamilton, ON.
3. **Maaz M**. Modelling the hospital as a queuing problem. Oral presentation at: Department of Economics workshop, McMaster University. 2019 Jan 23; Hamilton, ON.
4. **Maaz M**. Incorporating marginal cost analysis with queuing theory. Oral presentation at: Department of Economics workshop, McMaster University. 2018 Nov 16; Hamilton, ON.
5. **Maaz M**, Tahir T, Muhammad M. Machine learning modelling in global health. Poster presented at: Canadian Global Health Students and Young Professionals Summit. 2017 Oct 28; Ottawa, ON.

4 HONOURS, SCHOLARSHIPS AND AWARDS

4.1 Research-specific

Best Student Presentation. \$100. Atlantic Canada Economics Association Oct 2019

4.2 Academic

Alex G. Climans Scholarship. \$1525. University of Toronto 2021
Basis. For high academic standing during premedical studies

Provost's Honour Roll. McMaster University 2020
Basis. For obtaining a perfect GPA in an academic year

University Senate Scholarship. \$800. McMaster University 2019
Basis. Given to 800 students with highest GPAs

Edward Jenkins Award. \$5000. McMaster University 2017
Basis. One award for member of Canadian Forces with outstanding academic achievement

5 RESEARCH EXPERIENCE

Department of Economics, McMaster University Apr 2020 - current

Supervisor. Bradley Ruffle, Anastasios Papanastasiou, and Angela Zheng

Title. Economic incentives for social distancing and mask-wearing during COVID-19

Funding. McMaster COVID-19 Research Fund

Contribution. Contributed to development of economic model to project the use of fines versus subsidies in order to promote social distancing and mask-wearing during COVID-19. Helped with design and execution of large survey of Ontarians in order to test the hypotheses generated by the theoretical model. Performed statistical analyses in R, specifically building ordered logistic regression models, and generating marginal effects plots to present the results of the statistical models.

Department of Economics, McMaster University Jul 2018 - May 2020

Supervisor. Anastasios Papanastasiou

Title. Analyzing the Canadian Resident Matching Service (CaRMS)

Contribution. Bachelor's thesis. Self-studied matching theory literature to understand how the CaRMS worked. Published expository article on how the residency matching algorithm works for a medical audience. Independently formulated the novel matching with compatibility constraints model to study the two-pronged issue of unmatched students and unfilled positions in the CaRMS, thereby writing the first paper in the matching theory literature studying this issue.

Centre for Health Econ. and Policy Analysis, McMaster University Jan 2019 - Apr 2019

Supervisor. Graham Dobbs

Title. Predicting geriatric depression using longitudinal data

Contribution. Planned project to use data to predict geriatric depression. Obtained access to the SHARE data set, a longitudinal survey of elderly people in Europe. Cleaned and transformed the data. Built regression and machine learning models using socioeconomic factors as predictors. Wrote and submitted a manuscript.

Department of Economics, McMaster University Sep 2018 - Apr 2019

Supervisor. Anastasios Papanastasiou

Title. Applying queuing theory to hospital management

Contribution. Senior (3rd year) undergraduate project. Thought of idea to use queuing theory, a field of math that studies wait lines and wait times, to analyze the problem of “hallway medicine” in Ontario. Independently derived novel mathematical model incorporating queuing theory and marginal cost analysis. Applied model to predicting occupancy rates in hospitals. Presented work at the Atlantic Canada Economics Association Conference. Wrote and published a manuscript.

St. Peter’s Hospital, Hamilton, ON Apr 2017 – Sep 2018

Supervisor. Ahmed Negm

Title. A systematic review of frailty interventions

Contribution. Screened thousands of abstracts and full text articles according to inclusion criteria. Performed data extraction on hundreds of full texts. Helped with drafting and proofreading.

Department of Health Evidence and Impact, McMaster University Feb 2017 – Aug 2017

Supervisor. Lehana Thabane

Title. Various projects related to evidence-based medicine

Contribution. Contributed to methodological design, search strategy, and inclusion criteria. Performed literature screening and data extraction. Involved in proofreading of manuscripts.

6 TEACHING EXPERIENCE

Private tutor, ECON 2GG3 Intermediate Micro II, McMaster Jan 2020 – Apr 2020

Peer tutor, HTHSCI 1I06 Inquiry, McMaster Sept 2019 – Apr 2020

ESL tutor for newcomers to Canada, Hamilton Public Library Sept 2018 – Apr 2020

Private tutor, ECON 2G03 Intermediate Micro I, McMaster Jan 2019 – Apr 2019

7 SERVICE

7.1 Editorial

Trainee Editorial Board, Tropical Diseases, Travel Medicine and Vaccines Nov 2020 – current

Section Editor, University of Toronto Medical Journal Sept 2020 – current

7.2 Referee

Economic Modelling