

# MAIMUNA S. MAJUMDER

## **EDUCATION**

*Massachusetts Institute of Technology (MIT)*

**Doctor of Philosophy (PhD)** in Engineering Systems (GPA: 5.0) 2015-2018

*Dissertation Committee:* Lydia Bourouiba, John S. Brownstein,  
Stan N. Finkelstein, & Richard C. Larson (**chair**)

**Master of Science (SM)** in Engineering Systems (GPA: 5.0) 2013-2015

*Tufts University*

**Master of Public Health (MPH)** in Epidemiology & Biostatistics 2012-2013

**Bachelor of Science (BS)** in Engineering Science (Civil & Environmental Concentration) 2008-2013

## **FELLOWSHIPS**

*Harvard Medical School*

Health Policy Data Science **Postdoctoral Fellowship** Fall 2018-Present

*Boston Children's Hospital & Harvard Medical School*

HealthMap Computational Epidemiology **Graduate Fellowship** Fall 2014-Summer 2018

## **OTHER HONORS AND AWARDS**

- Delta Omega Abstract Winner 2012
- Empower Social Entrepreneurship Fellowship 2012
- AGU Outstanding Student Paper 2011
- Borghesani Memorial Prize 2011
- Karno Dean's Award for Academic Excellence and Leadership 2010
- Tufts University Summer Scholar 2010

## **ACADEMIC CONTRIBUTIONS**

### **EDITED BOOKS**

[2] Leveraging Big Data in Global Health

Leo A. Celi, **Maimuna S. Majumder**, Patricia Ordonez, Sebastian Juan Osorio, Kenneth Paik, Melek Somai, and Olivia M. Waring (Alphabetical)  
*Springer* (Forthcoming: 2019)

[1] Ebola's Message: Public Health and Medicine in the 21st Century

Nicholas G. Evans, Tara C. Smith, and **Maimuna S. Majumder**  
*MIT Press* (Published: October 2016)

## SCIENTIFIC JOURNAL PUBLICATIONS

[17] Rapid estimation of pneumonic plague transmission in Madagascar, August–November 2017  
**Maimuna S. Majumder**, Emily L. Cohn, Mauricio Santillana, John S. Brownstein  
*PLOS Currents Outbreaks* (Published: November 2018)

[16] Seasonality of birth defects in West Africa: Could congenital Zika syndrome be to blame?  
**Maimuna S. Majumder**, Rosanna Hess, Ratchneewan Ross, Helen Piontkivska  
*F1000Research* (Published: February 2018)

[15] Nosocomial amplification of MERS-coronavirus in South Korea, 2015  
**Maimuna S. Majumder**, John S. Brownstein, Stan N. Finkelstein, Richard C. Larson, Lydia Bourouiba  
*Transactions of the Royal Society of Tropical Medicine and Hygiene* (Published: October 2017)

[14] County-level assessment of United States kindergarten vaccination rates for measles mumps rubella (MMR) for the 2014–2015 school year  
Sheryl A. Kluberg, Denise P. McGinnis, Yulin Hswen, **Maimuna S. Majumder**, Mauricio Santillana, John S. Brownstein  
*Vaccine* (Published: October 2017)

[13] GELL: Automatic Extraction of Epidemiological Line Lists from Open Sources  
Saurav Ghosh, Prithwish Chakraborty, Bryan L. Lewis, **Maimuna S. Majumder**, Emily Cohn, John S. Brownstein, Madhav V. Marathe, Naren Ramakrishnan  
*Proceedings of the 23rd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* [Acceptance Rate: 9%] (Published: August 2017)

[12] Vaccine compliance and the 2016 Arkansas mumps outbreak  
**Maimuna S. Majumder**, Colleen M. Nguyen, Emily L. Cohn, Yulin Hswen, Sumiko R. Mekaru, John S. Brownstein  
*Lancet Infectious Diseases* (Published: March 2017)

[11] Case characteristics among Middle East respiratory syndrome coronavirus outbreak and non-outbreak cases in Saudi Arabia from 2012 to 2015  
Fatimah S. Al-Hamlan, **Maimuna S. Majumder**, John S. Brownstein, Jared Hawkins, Hail M. Al-Abdely, Abdullah Alzahrani, Dalia A. Obaid, Mohammed N. Al-Ahdal, Abdulaziz Bin Saeed  
*BMJ Open* (Published: January 2017)

[10] A Platform for Monitoring Regional Antimicrobial Resistance, Using Online Data Sources: ResistanceOpen  
Derek R. MacFadden, David Fisman, Jeff Andre, Yuki Ara, **Maimuna S. Majumder**, Isaac I. Bogoch, Nick Daneman, Annie Wang, Marianna Vavitsas, Lucas Castellani, John S. Brownstein  
*Journal of Infectious Diseases* (Published: December 2016)

[9] Risks of Death and Severe Disease in Patients With Middle East Respiratory Syndrome Coronavirus, 2012–2015  
Caitlin M. Rivers, **Maimuna S. Majumder**, Eric T. Lofgren  
*American Journal of Epidemiology* (Published: September 2016)

- [8] Yellow fever vaccination coverage heterogeneities in Luanda province, Angola  
**Maimuna S. Majumder**, Colleen M. Nguyen, Sumiko R. Mekaru, John S. Brownstein  
*Lancet Infectious Diseases* (Published: September 2016)
- [7] Utilizing Nontraditional Data Sources for Near Real-Time Estimation of Transmission Dynamics During the 2015-2016 Colombian Zika Virus Disease Outbreak  
**Maimuna S. Majumder**, Mauricio Santillana, Sumiko R. Mekaru, Denise P. McGinnis, Kamran Khan, John S. Brownstein  
*JMIR Public Health & Surveillance* (Published: June 2016)
- [6] The velocity of Ebola spread in parts of west Africa  
Kate Zinszer, Kathryn Morrison, Aranka Anema, **Maimuna S. Majumder**, John S. Brownstein  
*Lancet Infectious Diseases* (Published: September 2015)
- [5] Mortality Risk Factors for Middle East Respiratory Syndrome Outbreak, South Korea, 2015  
**Maimuna S. Majumder**, Sheryl A. Kluber, Sumiko R. Mekaru, John S. Brownstein  
*Emerging Infectious Disease* (Published: August 2015)
- [4] 2014 Ebola Outbreak: Media Events Track Changes in Observed Reproductive Number  
**Maimuna S. Majumder**, Sheryl Kluber, Mauricio Santillana, Sumiko Mekaru, John S. Brownstein  
*PLOS Currents Outbreaks* (Published: April 2015)
- [3] Substandard Vaccination Compliance and the 2015 Measles Outbreak  
**Maimuna S. Majumder**, Emily L. Cohn, Sumiko R. Mekaru, Jane E. Huston, John S. Brownstein  
*JAMA Pediatrics* (Published Online: March 2015)
- [2] New digital technologies for the surveillance of infectious diseases at mass gathering events  
Elaine O. Nsoesie, Sheryl A. Kluber, Sumiko R. Mekaru, **Maimuna S. Majumder**, Kamran Khan, Simon I. Hay, John S. Brownstein  
*Clinical Microbiology and Infection* (Published Online: December 2014)
- [1] Estimation of MERS-Coronavirus Reproductive Number and Case Fatality Rate for the Spring 2014 Saudi Arabia Outbreak: Insights from Publicly Available Data  
**Maimuna S. Majumder**, Caitlin Rivers, Eric Lofgren, David Fisman  
*PLOS Currents Outbreaks* (Published: December 2014)

## **PRE-PRINTS AND PAPERS IN PREPARATION**

- [5] Vaccine deployment and Ebola transmission dynamics estimation in Eastern DR Congo  
**Maimuna S. Majumder**, Sherri Rose  
*Social Science Research Network* (\*Preprint: December 2018)
- [4] Digital Disease Data for Infectious Disease Surveillance  
Haley Feazel-Orr, **Maimuna S. Majumder**  
Status: Invited Paper in preparation for *Journal of Clinical Microbiology*

[3] Using Non-Traditional Data Sources for Near Real-Time Estimation of Transmission Dynamics in the Hepatitis-E Outbreak in Namibia, 2017-2018

Michael Morley\*, **Maimuna S. Majumder\***, Tony Gallanis, Joseph Wilson [\*Joint First Author]

Status: Submitted

[2] Tuberculosis and Foreign-Born Populations in the United States: A Mixed Methods Analysis of Media Reporting and Political Identification

Angel N. Desai, Shravanthi M. Seshasayee, **Maimuna S. Majumder**, Britta Lassmann, Lawrence C.

Madoff, JohnBrownstein

Status: Submitted

[1] Estimating a feasible serial interval range for Zika fever

**Maimuna S. Majumder**, Emily Cohn, Durland Fish, John S. Brownstein

*Bulletin of the World Health Organization* (\*Preprint: February 2016)

## **BOOK CHAPTERS**

[3] The Blind Men, the Elephant and the Well: A Parable for Complexity and Contingency

From *Water Diplomacy in Action*

**Maimuna S. Majumder**

*Anthem Press* (Published: January 2017)

[2] Ebola's Message: A Multidisciplinary Call to Action

From *Ebola's Message: Public Health and Medicine in the 21st Century*

Nicholas G. Evans, Tara C. Smith, and **Maimuna S. Majumder**

*MIT Press* (Published: October 2016)

[1] A Water Management Fable for All Time

From *Water Diplomacy: A Negotiated Approach to Managing Complex Water Networks*

Shafiqul Islam and Lawrence Susskind with **Maia Majumder**

*Routledge* (Published: June 2012)

## **SELECTED PRESENTATIONS, MEETINGS, AND PANELS**

American Society of Microbiology: Next Generation Sequencing **Keynote**

Fall 2018

"Digital Disease Data and Infectious Disease Surveillance"

Harvard University

Spring 2018

ComSciCon 2018 **Panelist +Mentor**

*Ready Together: A Day-Long Symposium for Epidemic Preparedness* at Harvard Medical School

Fall 2017

"Ready Together: Data Sharing for Global Health Security" **+Panelist**

Boston University (World Statistics Day)

Fall 2017

"Gerrymandering Awareness in the United States: A Big Data Approach"

Metric Geometry and Gerrymandering Workshop at Tufts University "Gerrymandering Awareness in the United States"	Spring 2017
University of California, San Diego Health Data Exploration Summer Institute <b>Participant</b>	Spring 2017
Massachusetts Department of Public Health "News Media, Math Modeling, & the 2016–17 Arkansas Mumps Outbreak"	Spring 2017
Massachusetts Institute of Technology Hacking Discrimination <b>Mentor</b>	Spring 2017
Massachusetts Institute of Technology Modeling and Assessment for Policy: Ebola Case Study <b>Mentor</b>	Spring 2017
Massachusetts Institute of Technology "Digital Disease Detection: MERS, Ebola, and Measles"	Spring 2017
Northeastern University "Digital Disease Detection of Viral Infections: Zika Fever in Central & South America"	Fall 2016
International Society for Infectious Diseases International Meeting on Emerging Diseases and Surveillance Hackathon <b>Mentor</b>	Fall 2016
Massachusetts Institute of Technology "Vaccine Development During the West African Ebola Outbreak"	Fall 2016
American Society of Microbiology: Microbe "Digital Disease Detection of Viral Infections: Zika Fever in Central & South America"	Spring 2016
Massachusetts Institute of Technology Modeling and Assessment for Policy: Ebola Case Study <b>Mentor</b>	Spring 2016
Chatham House Roundtable <b>Participant</b> "Strengthening Data Sharing for Public Health: Emerging Tech"	Spring 2016
International Conference of Emerging Infectious Diseases "2014 Ebola Outbreak: Media Events Track Changes in Observed Reproductive Number" "Estimation of MERS-Coronavirus Reproductive Number and Case Fatality Rate for the Spring 2014 Saudi Arabia Outbreak: Insights from Publicly Available Data"	Spring 2015
White House Workshop <b>Participant</b> "Integrating Forecasting Models for Decision-making: A National Strategy"	Spring 2015
3rd International Conference on Digital Disease Detection <b>Panelist</b> "Ebola Experience with Digital Disease Detection"	Spring 2015
Chatham House Roundtable <b>Participant</b> "Strengthening Data Sharing for Public Health"	Spring 2015

Boston University "Sub-standard vaccination compliance and the 2015 Disneyland measles outbreak"	Spring 2015
Microsoft New England <b>Panelist</b> "A Conversation on Civic Tech: Urban Infrastructures for Public Health"	Fall 2014
Massachusetts Institute of Technology "Mathematical Modeling of the 2014 West African Ebola Outbreak"	Fall 2014
Harvard School of Public Health "Armchair Epidemiology: Exploring Middle East Respiratory Syndrome"	Spring 2014
Massachusetts Institute of Technology "Environmental and Infrastructural Determinants of Cholera in Bangladesh"	Spring 2014
Tufts University Women in Engineering <b>Panelist</b>	Fall 2013
Tufts Environmental Literacy Institute: Annual Workshop – OneHealth "Spatiotemporal patterns of annual cholera outbreaks in Matlab, Bangladesh"	Spring 2013
American Public Health Association Fall Meeting <b>Delta Omega Abstract Winner</b> "Water Quality vs. Sanitation Accessibility: What is the most effective intervention point for cholera in Dhaka, Bangladesh?"	Fall 2012
Tufts University Women in Engineering <b>Panelist</b>	Fall 2012
Clinton Global Initiative University Annual Meeting <b>CGIU Commitments Challenge, 2<sup>nd</sup> Place</b> "The Village Zero Project: Tracking a National Cholera Epidemic"	Spring 2012
Tufts Idea Exchange (TEX) "Theta + Pi = ?" – A TED-style talk on merging theory and practice for development	Fall 2011
American Geophysical Union Fall Meeting <b>Hydrology Section: Outstanding Student Paper Award Winner</b> "Water Quality vs. Sanitation Accessibility: What is the most effective intervention point for cholera in Dhaka, Bangladesh?"	Fall 2011

## **RESEARCH EXPERIENCE**

Harvard University Postdoctoral Research Fellow in Health Policy Data Science <b>Mentor:</b> Sherri Rose <b>Topic:</b> Novel Data Sources and Generalizability	Fall 2018-Present
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HealthMap at Boston Children's Hospital & Harvard Medical School

Computational Epidemiology Research Fellow

Fall 2014-Summer 2018

- Conducted research on endemic, vaccine-preventable, and emerging infectious diseases using statistical and probabilistic modeling, data mining, and network simulation methods
- Explored novel techniques for infectious disease data procurement
- Created meaningful data visualizations for infectious diseases
- Wrote about infectious disease data for general public readership
- Participated in grant proposal preparation, including contracts with private industry

USAID Comprehensive Initiative for Technology Evaluation (CITE) at MIT

Research Assistant: Sustainability Team

Fall 2013-Summer 2014

- Developed a "consumer reports of development" with a particular focus on sustainability
- Performed reviews of water, sanitation, and health technologies used in developing countries and create case studies of project implementation
- Identified key drivers and assessment methodologies for sustainability along the environmental and technical dimensions
- Conducted detailed evaluations of water, sanitation, and health technologies, including design of appropriate qualitative and quantitative models and tools

International Centre for Diarrhoeal Diseases Research Bangladesh (ICDDR,B)

Research Fellow

Spring 2010-Spring 2013

- Performed statistical and probabilistic analysis on extensive patient database at the ICDDR,B clinic in Dhaka, Bangladesh with an innovative focus on cholera and infrastructural interventions
- Collected data from ICDDR,B clinic in Matlab, Bangladesh to perform a rural vs. urban comparative analysis on the effectiveness of different cholera prevention methods
- Interviewed clinic patients about their sexual and reproductive health, socioeconomic status, experiences with diarrheal disease, etc.
- Published findings as principal investigator

## **TEACHING EXPERIENCE**

Massachusetts Institute of Technology (MIT)

Course Faculty: HST 936 – Global Health Informatics

Spring 2018-Present

- Designed course curriculum on 2018 and 2019 spring semester seminars
- Prepared materials for three lecture hours per week, for a total of 13 weeks
- Developed and taught skills-oriented lesson plans on accessing and analyzing data via open APIs
- Facilitated discourse regarding strengths and limitations of data sources and analytical methods
- Helped students use system-framing to establish bounds of their course projects
- Evaluated students via course projects, class participation, practice questions, and online quizzes

Institute for Global Leadership: Education for Public Inquiry and International Citizenship (EPIIC)

Teaching Assistant: EXP 91 – Global Health and Security

Fall 2012-Spring 2013

- Coordinated year-long colloquium and symposium, including the invitation of guest lecturers and selection of course readings
- Graded assignments and met with students during office hours
- Executed expertise-based workshops (i.e. epidemiological methods)
- Guided and supported student research groups

Tufts University Experimental College

Lecturer: EXP 23 – Combating Infectious Disease

Spring 2012

- Conducted extensive literature review and developed course concept and syllabus, including lecture content and readings assigned
- Graded assignments, met with students during office hours, and designed two lectures per week
- Lectured and facilitated classroom discussion for for 150 minutes per week
- Collaborated with and invited forerunners in the relevant fields to guest lecture, offering exciting educational and professional opportunities for students

## **OUTREACH**

### **CONTENT FOR THE GENERAL PUBLIC**

Social Media, Math And The Mystery Of A Mumps Outbreak

**Maimuna Majumder**

*NPR Shots* (Published: March 2017)

Higher Rates Of Hate Crimes Are Tied To Income Inequality

**Maimuna Majumder**

*FiveThirtyEight* (Published: January 2017)

Election Got You Feeling Down? Good News: It Isn't Just You

**Maimuna Majumder**

*Wired* (Published: November 2016)

An Intriguing Link Between Police Shootings and Black Voter Registration

**Maimuna Majumder**

*Wired* (Published: September 2016)

Anatomy of the South Korean MERS outbreak

Tina Saey, **Maimuna Majumder**, Stephen Egts

*Science News Magazine* (Published: December 2015)

Ebola: Lessons from a human tragedy

**Maimuna (Maia) Majumder**

*Significance* (Published: December 2015)

The fight against Ebola

**Maimuna (Maia) Majumder**

*Significance* (Published: December 2014)

Middle East respiratory virus came from camels, not terrorists

Ian Mackay, Katherine Arden, Lisa Murillo, **Maia Majumder**, Nicholas G. Evans and Stephen Goldstein

*The Conversation* (Published: July 2014)



**Mentees:** Contact information available upon request

**Twitter:** @maiamajumder

**Blog:** [www.maimunamajumder.wordpress.com](http://www.maimunamajumder.wordpress.com)

**Website:** [www.maimunamajumder.com](http://www.maimunamajumder.com)

**Recent Media Features:** The Atlantic, The BBC, BetaBoston, Boston.com, Boston Globe, CS Monitor, Forbes, Fortune, Huffington Post, Jezebel, The LA Times, The New York Times, Nature, NPR, PBS Newshour, PBS Nova, Reuters, Science Insider, Scientific American, Stat News, Toronto Star, Wired Magazine

**ANALYTIC TOOLS:** @RISK, Adobe Illustrator, ArcGIS, AutoCAD, CSS, EpiData, ENVI, HTML, Mathcad, MiniTab, Orange, PrecisionTree, Python, R, SAS, SPSS, SQL, StatPlanet, VBA, XLMiner, XML

**LANGUAGES:** English, Bengali

**HOBBIES:** Jazz vocalist, budding chef, primal wellness enthusiast