## BIOGRAPHICAL SKETCH
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NAME: Miller, Aaron C.

eRA COMMONS USER NAME (credential, e.g., agency login): AARMILLE

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

| INSTITUTION AND LOCATION | DEGREE *(if applicable)* | Completion Date MM/YYYY | FIELD OF STUDY |
|---|---|---|---|
| Creighton University, Omaha, NE | BA | 05/2008 | Economics |
| University of Iowa, Iowa City, IA | MA | 05/2011 | Economics |
| University of Iowa, Iowa City, IA | PhD | 08/2015 | Pharmaceutical Socioeconomics |

## A. Personal Statement

I am an assistant professor of Epidemiology in the College of Public Health at The University of Iowa. I am also a cluster faculty member in the Iowa Informatics Initiative (UI3) and am a core faculty member of the StatEpi and CompEpi research groups along with Drs. Polgreen, Cavanaugh and Segre. Following graduate school in 2015, I was an assistant professor at Cornell College, where I helped to start a data analytics program. While at Cornell I developed a health analytics course on the topic of *discovering diagnostic errors in hospital discharge data*, in collaboration with Dr. Manish Suneja and Dr. Polgreen. In May of 2017, I left Cornell to pursue a research career and began a postdoctoral position in the Department of Computer Science at the University of Iowa. Dr. Alberto Segre was my postdoctoral advisor and my work involved the study of missed diagnostic opportunities using large administrative data sources and using mobile device sensors for influenza surveillance and forecasting. In March of 2018, I began my current position in the Department of Epidemiology.

My work primarily focuses on applications of computational epidemiology, which involves the use of large data sources along with advanced computational and statistical methods. Applications I have utilized these methodological approaches for have involved identifying and studying missed or delay diagnostic opportunities, finding new risk factors for infectious diseases, and understanding healthcare associated infections. Other areas of my research interest involve the application of data science and quantitative modelling to improve disease surveillance and forecasting. I am also particularly interested in the application of economic theory and computational modelling to discover optimal diagnosis, treatment and prevention approaches for infectious diseases.

## B. Positions and Honors

### Positions and Employment
- 2008-2011    Teaching Assistant, Department of Economics                University of Iowa, Iowa City, IA
- 2012              Instructor, Department of Economics                          University of Iowa, Iowa City, IA
- 2012-2015    Research Assistant, College of Pharmacy                    University of Iowa, Iowa City, IA
- 2015-2017    Adjunct Assistant Professor, College of Pharmacy      University of Iowa, Iowa City, IA
- 2015-2017    Assistant Professor, Department of Economics &

|  | Business | Cornell College, Mount Vernon, IA |
| • 2017-2018 | Postdoctoral Scholar, Department of Computer Science | University of Iowa, Iowa City, IA |
| • 2018- | Assistant Professor, Department of Epidemiology | University of Iowa, Iowa City, IA |

**Other Experience and Professional Membership**
2011-      International Society for Disease Surveillance
2012-      American Society of Health Economists
2018-      Society to Improve Diagnosis in Medicine
2018-      Infectious Disease Society of America
2019-      Society for Epidemiologic Research


## C.  Contributions to Science

I have conducted studies to identify patterns of diagnostic errors and inappropriate prescribing using large longitudinal administrative data sources. This work has included analysis of missed opportunities to diagnose tuberculosis and injection drug use during visits for drug-related infections. I have also studied inappropriate antibiotic prescribing for urinary tract infections following changes to guidelines.

a.  Miller AC, Polgreen LA, Cavanaugh JE, Hornick DB, Polgreen PM. Missed Opportunities to Diagnose Tuberculosis Are Common Among Hospitalized Patients and Patients Seen in Emergency Departments. *Open Forum Infectious Diseases*. 2015 Dec 19;2(4):ofv171. PMID: 26705537

b.  Durkin MJ, Keller, M, Butler AM, Kwon, JH, Dubberke ER, Miller AC, Polgreen PM, Olsen MA. (2018) An Assessment of Inappropriate Antibiotic Use and Guideline Adherence for Uncomplicated Urinary Tract Infections. *Open Forum Infectious Diseases*. September 2018: 5(9):ofy198. PMID: 30191156 PMCID: PMC6121225

c.  Miller AC, Polgreen PM. Many opportunities to identify, diagnose and treat injection drug-related infections are missed: a population-based cohort study of inpatient and emergency department settings. *Clinical Infectious Diseases*. April 2019: 68(7):1166-1175. PMID: 30215683

I have also studied hospital acquired infections using large data sources to identify trends across different institutions. This work has sought to explore the complex interaction between hospital-level risk for factors for nosocomial infections and other markers of hospital quality of efficiency, such as inpatient length of stay.

d.  Miller AC, Polgreen LA, Cavanaugh JE, Polgreen PM. Hospital *Clostridium difficile* Infection Rates and Prediction of Length of Stay in Patients Without *C. difficile* Infection. *Infection Control and Hospital Epidemiology*. April 2016: 37(4):404-10. PMID: 26858126

e.  Miller AC, Polgreen LA, Cavanaugh JE, Polgreen PM. Hospital *Clostridium difficile* infection (CDI) incidence as a risk factor for hospital-associated CDI. *American Journal of Infection Control*. July 2016: 44(7):825-9. PMID: 26944007

I am an active member in the Iowa Computational Epidemiology (CompEpi) and Statistical Epidemiology (StatEpi) groups, which approach problems in epidemiology by developing interdisciplinary collaborations with researchers in statistics, computer science, and economics. My work in these groups has involved the use of novel data sources and mobile devices for infectious diseases surveillance. Research I have conducted has included using game theory to model strategic screening decisions and smartphone connected thermometers to track influenza.

f.  Miller AC, Polgreen LA, Polgreen PM. Optimal Screening Strategies for Healthcare Associated Infections in a Multi-Institutional Setting. *PLOS Computational Biology*. January 2014:10(1):e1003407. PMID: 24391484

g. Miller AC, Singh I, Koehler E, Polgreen PM. A Smartphone-Driven Thermometer Application for Real-time Population- and Individual-Level Influenza Surveillance. *Clinical Infectious Diseases*. July 2018:67(3): 10.1093/cid/ciy073. PMID: 29432526

**Complete List of Published Work in My Bibliography**

https://www.ncbi.nlm.nih.gov/sites/myncbi/18sImguk1VcBy/bibliography/55041523/public/?sort=date&direction=ascending

**D. Additional Information: Research Support and/or Scholastic Performance**

**Ongoing Research Support**

Centers for Disease Control and Prevention (PI: Alberto Segre) Modeling Infectious Disease in Healthcare Network (MInD – Healthcare)          7/1/2017-7/31/2020

Veteran's Rural Health Resource Center (PI: Michael Ohl) Data Mining Modeling IV Drug Usage and Infection          10/01/2018-09/31/2019