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|  | Department of Epidemiology and Biostatistics |
|  | College for Public Health and Social Justice, Saint Louis University |
|  | 3545 Lafayette Ave., Room 484, Saint Louis, MO 63108 U.S.A. |
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|  | E-mail: [miao.cai@slu.edu](mailto:miao.cai@slu.edu) |
|  | Personal website: <caimiao0714.com> |
|  | Nationality: China |
|  | Find me on: [GitHub](https://github.com/caimiao0714), [ORCID](https://orcid.org/0000-0003-0170-6905), [Google Scholar](https://scholar.google.com/citations?user=kjFCzEkAAAAJ&hl=en), [ResearchGate](https://www.researchgate.net/profile/Miao_Cai2), [LinkedIn](https://www.linkedin.com/in/miao-cai-7b5a62a3/), [Scopus](https://www.scopus.com/authid/detail.uri?authorId=56824998300) |
|  | Areas of interests |
|  | Bayesian inference, Clinical Epidemiology, Health economics |
|  | Education |
| 2017-2020 | Ph.D. in Biostatistics, Saint Louis University, the United States |
| 2014-2017 | Master in Hospital Management, Huazhong University of Science and Technology, China |
| 2010-2014 | Bachelor in Health Management, Huazhong University of Science and Technology, China |
|  | Working experience |
| 2019-2020 | Biostatistician at the Clinical Epidemiology Center, Department of Veteran Affairs, |
|  | Saint Louis, USA |
| 2017-2020 | Graduate Research assistant at Department of Epidemiology and Biostatistics, Saint |
|  | Louis University, USA |
| 2016 | Data analyst at Diao Long Medical Data Co. Ltd, Wuhan, Hubei, China |
| 2014 | Program coordinator at Health and Family Planning Commission, Wuhan, Hubei, China |

Programming languages

* Everyday R user: Rmarkdown, tidyverse, data.table, shiny, brms*: : :*

SAS Data management and statistical modeling for over 2 billion national VA patient datasets

Python Experienced Python user: pandas, pyspark, dask, h2o, tensorflow

Stan & JAGS Bayesian inference with Gibbs sampler and Hamiltonian Monte Carlo

SQL Data management with over 2 billion patient data at the VA

ArcGIS Thematic maps, geoprocessing, spatial interpolation

GeoDA Spatial statistics: Moran’s I, LISA, spatial lag/error models

STATA Econometric analysis

LATEX Aesthetically beautiful documents with LATEX

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Participated Projects

2017-2019 *National Science Foundation, USA* GOALI/Collaborative Research: Human Maintenance - A Prognostics Framework to Model Changes in Drivers’ Safety Performance and Optimize Dispatching Policies. PI: Fadel Megaged at Auburn University & Steven E. Rigdon (PhD mentor) at Saint Louis University

2015-2018 *National Natural Science Foundation of China* Performance Evaluation and Influencing Fac-tors for the Closed Type Medical Association Based on Structural Equation. PI: Hongbing Tao, PhD

2012-2015 *National Natural Science Foundation of China* Construction of Evaluation Model and Man-aging Pathways of Inpatient Hospital Resources Utilization in Urban General Hospitals. PI: Hongbing Tao, PhD

2013-2014 *Ministry of Health, China* Research on the function orientation and scale of public hospitals in China. PI: Hongbing Tao, PhD

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|  | Honors & Awards |
| 2018 | *PhD student* sponsored by the China Scholarship Council, first year fulled funded by a |
|  | NSF grant, 2nd and 3rd year partial funded by Saint Louis University and China Scholar- |
|  | ship Council |
| 2016 | *Joint master student* by China Scholarship Council (300 out of all master students in China) |
| 2015 | *Excellent graduate student* by Huazhong University of Science and Technology |
| 2014 | *Best Undergraduate Dissertation Paper* (Silver prize) by the Ministry of Education, Hubei |
| 2013 | *National Scholarship* by Huazhong University of Science and Technology |
| 2012 | *National Lizhi Scholarship* by Huazhong University of Science and Technology |
| 2012 | *HongKong Ethics Scholarship* by HongKong Ethic Association (top 5%) |
| 2011 | *National Lizhi Scholarship* by Huazhong University of Science and Technology |

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|  | Publications & talks |
|  | International peer-reviewed Journal articles |
| 2018 | Xiaojun Lin, Miao Cai, Qiang Fu, et al. (2018), “Does Hospital Competition Harm Inpatient |
|  | Quality? Empirical Evidence from Shanxi, China”, *International Journal of Environmental* |
|  | *Research and Public Health*. DOI:[10.3390/ijerph15102283](https://doi.org/10.3390/ijerph15102283) |
| 2018 | Miao Cai, Echu Liu, Wei Li\*. (2018), “Rural Versus Urban Patients: Benchmarking the Out- |
|  | comes of Patients with Acute Myocardial Infarction in Shanxi, China from 2013 to 2017”, |
|  | *International Journal of Environmental Research and Public Health*. DOI:[10.3390/ijerph15091930](https://doi.org/10.3390/ijerph15091930) |
| 2018 | Miao Cai, Echu Liu, Hongbing Tao\*, et al. (2018), “Does A Medical Consortium Influence |
|  | Health Outcomes of Hospitalized Cancer Patients? An Integrated Care Model in Shanxi, |
|  | China”, *International Journal of Integrated Care*. DOI: [10.5334/ijic.3588](https://doi.org/10.5334/ijic.3588) |
| 2018 | Nan Zhang, Xiang Hu, Qiao Zhang, Peng Bai, Miao Cai, et al. (2018), “Non-high-density |
|  | lipoprotein cholesterol to high-density lipoprotein cholesterol ratio is an independent risk |
|  | factor for diabetes mellitus: results from a population-based cohort”, *Journal of Diabetes*. |

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|  | DOI: [10.1111/1753-0407.12650](https://doi.org/10.1111/1753-0407.12650) |
| 2017 | Miao Cai, Echu Liu, Hongbing Tao\*, et al. (2017), ”Does Level of Hospital Matter? A Study |
|  | of Mortality of Acute Myocardial Infarction Patients in Shanxi, China”. *American Journal* |
|  | *of Medical Quality*. DOI:[10.1177/1062860617708608](https://doi.org/10.1177/1062860617708608) |
| 2017 | Xiaojun Lin, Miao Cai, Hongbing Tao\* (2017), “Insurance status, inhospital mortality and |
|  | length of stay in hospitalised patients in Shanxi, China: a cross-sectional study”, *BMJ open*. |
|  | DOI: [bmjopen-2017-015884](https://doi.org/10.1136/bmjopen-2017-015884) |
| 2017 | Manli Wang, Haiqing Fang, Hongbing Tao\*, Zhaohui Cheng, Xiaojun Lin, Miao Cai, et al. |
|  | (2017), “Bootstrapping data envelopment analysis of efficiency and productivity of county |
|  | public hospitals in Eastern, Central, and Western China after the public hospital reform”, |
|  | *Journal of Huazhong University of Science and Technology*. DOI:[10.1007/s11596-017-1789-6](https://doi.org/10.1007/s11596-017-1789-6) |
| 2016 | Zhaohui Cheng, Miao Cai, Hongbing Tao\* (2016), “The efficiency and productivity mea- |
|  | surement of rural township hospitals in China: a bootstrapping data envelopment analy- |
|  | sis”, *BMJ Open*. DOI: [10.1136/bmjopen-2016-011911](https://doi.org/10.1136/bmjopen-2016-011911) |
| 2016 | Xiaojun Lin, Hongbing Tao\*, Miao Cai, et al (2016), “A systematic Review and Meta- |
|  | analysis of the Relationship Between Hospital Volume and Outcome for Percutaneous |
|  | Coronary Intervention”, *Medicine*. DOI: [10.1097/MD.0000000000002687](https://doi.org/10.1097/MD.0000000000002687) |
| 2015 | Qin Shu, Miao Cai, Hong-bing Tao\* (2015), ”What does a Hospital Survey on Patient Safety |
|  | reveal about patient safety culture of surgical units compared with that of other units? ”, |
|  | *Medicine*. DOI:[10.1097/MD.0000000000001074](https://doi.org/10.1097/MD.0000000000001074) |
| 2015 | Zhaohui Cheng, Hongbing Tao\*, Miao Cai (2015), ”Technical efficiency and productivity |
|  | of Chinese county hospitals: an exploratory study in Henan province, China”, *BMJ Open*. |
|  | DOI: [10.1136/bmjopen-2014-007267](https://doi.org/10.1136/bmjopen-2014-007267) |
|  | Conference abstracts |
| 2016 | Xiaojun Lin, Hongbing Tao\*, Miao Cai, et al. (2016), ”Health insurance and quality and |
|  | efficiency of medical care for patients with acute myocardial infraction in tertiary hos- |
|  | pitals in Shanxi, China: a retrospective study”. *The Lancet-CAMS Health Summit*. DOI: |
|  | [10.1016/S0140-6736(16)31997-3](https://doi.org/10.1016/S0140-6736(16)31997-3) |
| 2016 | Manli Wang, Hongbing Tao\*, Haiqing Fang, Zhaohui Cheng, Miao Cai, et al. (2016), ”Pa- |
|  | tient safety culture in surgical departments versus other departments in county hospitals |
|  | of Hubei province, China: a cross-sectional survey”. *The Lancet-CAMS Health Summit*. |
|  | DOI: [10.1016/S0140-6736(16)31998-5](https://doi.org/10.1016/S0140-6736(16)31998-5) |
| 2015 | Zhaohui Cheng, Hongbing Tao\*, Miao Cai, et al. (2015), ”Using a two-stage data envelop- |
|  | ment analysis to estimate the efficiency of county hospitals in China: A panel data study”. |
|  | *The Lancet-CAMS Health Summit*. DOI:[10.1016/S0140-6736(15)00645-5](https://doi.org/10.1016/S0140-6736(15)00645-5) |
|  | Conference presentations |
| 2019 | Xiaojun Lin, Kenton Johnston, Miao Cai. (March 2019), ”Does the medical consortium |
|  | reform improve hospital efficiency? Evidence from secondary general hospitals in Shanxi, |
|  | China, 2013-2017”, *The 1st Health Economics and Policy Forum* at Peking University, Beijing, |
|  | China |
| 2018 | Miao Cai, E. Liu, H. Tao, et al. (May, 2018), ”Does A Medical Consortium Influence Health |
|  | Outcomes of Hospitalized Cancer Patients: An Integrated Care Model in Shanxi, China”, |

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|  | *2018 Biennial Conference ”Advances in Health Policy and Healthcare: The Road Ahead”* by |
|  | China Health Policy and Management Society (CHPAMS) at Yale University, New Haven, |
|  | Connecticut, USA |
|  | Chinese peer-reviewed journal articles |
| 2017 | Miao Cai, H. Tao, E. Liu, et al. ”The Influence of Market Competition on Hospital Techni- |
|  | cal Efficiencies: Empirical Evidence from Henan and Jiangsu Provinces”. *Chinese Hospital* |
|  | *Management*. 2017, 37(6): 22-24.[Link](http://www.cnki.com.cn/Article/CJFDTotal-YYGL201706012.htm) |
| 2017 | L. Delgado, H. Tao, Miao Cai, Ashleigh Oguagha. ”Adoption and implementation of mul- |
|  | tidisciplinary cancer teams in China: Health professionals’ views”. *Chinese Journal of* |
|  | *Medical Management Sciences*. 2017, 7(3): 41-46.[Link](http://www.cnki.com.cn/Article/CJFDTOTAL-YLGL201703008.htm) |
| 2017 | J. He, H. Tao, X. Lin, T. Xiao, Miao Cai. ”A Comparative Study on Medical Quality among |
|  | Hospitals of Different Ownerships”. *Chinese Health Quality Management*. 2017, 24(4): 18 |
|  | - 20. [Link](http://www.cnki.com.cn/Article/CJFDTOTAL-WSJG201704010.htm) |
| 2017 | S. Xia, H. Tao, L. Du, Miao Cai, X. Lin, H. Lin. ”Problems and Countermeasures in Qual- |
|  | ity and Safety of Mobile Health Service in the Context of ’Internet Plus’”. *Chinese Health* |
|  | *Quality Management*. 2017, 24(3): 82 - 85.[Link](http://www.cnki.com.cn/Article/CJFDTOTAL-WSJG201703030.htm) |
| 2016 | H. Lin, H. Tao, Z. Cheng, X. Lin, Miao Cai. ”Medical resource utilization efficiency of |
|  | county-level Traditional Chinese medicine hospitals and their influencing factors in Henan”. |
|  | *Chinese Journal of Hospital Administration*. 2016, 32(2): 117 - 120.[Link](http://xuewen.cnki.net/CMFD-1016781136.nh.html) |
| 2016 | Y. Zuo, H. Tao, Z. Cheng, H. Lin, Miao Cai. ”Analysis of Efficiency Changes of Private |
|  | Hospitals in Henan Province Based on Malmquist Index”. *Chinese Hospital Management*. |
|  | 2016; 36(6):35-37. [Link](http://www.cnki.com.cn/Article/CJFDTOTAL-YYGL201606020.htm) |
| 2016 | P. Zhang, H. Tao, X. Lin, Miao Cai. ”Status Quos and Quality and Safety Problems of the |
|  | Medical associations in China and the Countermeasures”. *Chinese Hospital Management*. |
|  | 2016, 36(11): 52-54. [Link](http://www.cnki.com.cn/Article/CJFDTOTAL-YYGL201611027.htm) |
| 2016 | X. Lin, H. Tao, S. Zhang, Z. Cheng, Miao Cai, H. Liu. ”A Visualization Analysis of the |
|  | Evolution of Hospital Efficiency”. *Chinese Hospital Management*. 2016, 36(4): 27-29. [Link](http://www.cnki.com.cn/Article/CJFDTOTAL-YYGL201604015.htm) |
| 2015 | Miao Cai, H. Tao. ”Status and Countermeasures of Adverse Events Report in Intensive |
|  | Care Units”. *Chinese Health Quality Management*. 2015, 22(2): 11-14. [Link](http://www.cnki.com.cn/Article/CJFDTOTAL-WSJG201502008.htm) |
| 2015 | H. Lin, H. Tao, Z. Cheng, Miao Cai. ”The efficiency evaluation of obstetrical departments |
|  | of hospitals in Wuhan and the factors affecting their efficiency”. *Chinese Journal of Medi-* |
|  | *cal Management Sciences*. 2015, 5(5): 9 - 13.[Link](http://www.cnki.com.cn/Article/CJFDTOTAL-YLGL201505004.htm) |
| 2013 | Miao Cai, H. Tao\*. ”Adverse events reporting status in internal medicine specialties and |
|  | surgery specialties and improving strategies”. *Chinese Hospitals*. 2013, 17(8): 31 – 33. [Link](http://www.cnki.com.cn/Article/CJFDTOTAL-ZGYU201308016.htm) |
| 2013 | Miao Cai, X. Xu, H. Cai, et al. ”Analysis on Different Approaches to Identifying Medical |
|  | Adverse Events and Intervention Measures”. *Medicine and Society*. 2013, 26(9): 20 – 22. |
|  | [Link](http://www.cnki.com.cn/Article/CJFDTOTAL-YXSH201309007.htm) |
| 2013 | Miao Cai, H. Tao\*, X. Lin et al. ”Factors Impeding Reporting of Medical Adverse Events |
|  | among Doctors and Nurses”. *Chinese Health Quality Management*. 2013, 20(5): 41 – 43. |
|  | [Link](http://www.cqvip.com/qk/98273x/201305/47221843.html) |

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Working papers

Qiong Hu, Amir Mehdizadeh, Nasrin Mohabbati Kalejahi, Mohammad Ali Alamdar Yazdi, Miao Cai, Aleksandr Vinel, Steven E. Rigdon, Karen C. Davis, Fadel M. Megahed. ”Bridg-ing the Gap between Transportation Safety Research and its Incorporation in Optimization Models: a Detailed Review and Perspective”, submitted to *Transportation Research Part C:* *Emerging Technologies*.

Miao Cai, Steven E. Rigdon, Daire Jansson, Leslie Hinyard, Zhengmin Qian. ”Validating Two Multiple Indicators and Three Single Numeric Score Charlson or Elixhauser Comor-bidity Indices Among the Population of Shanxi, China”, submitted to *Medical Care*.

Miao Cai, Echu Liu, Steven E. Rigdon, Zhengmin Qian, Rhonda BeLue, Jen Jen Chang. ”Association between maternal physical exercise and the risk of preterm birth: A case-control study in Wuhan, China”, submitted to *Medical Care*.

Miao Cai, Mohammad Ali Alamdar Yazdi, Qiong Hu, Amir Mehdizadeh, Karen C. Davis, Aleksandr Vinel, Fadel M. Megahed, Steven E. Rigdon. ”Truck Transportation Safety, Fa-tigue, Driver Characteristics and Weather: An Exploration Data Analysis and Visualiza-tion”, submitted to *Journal of Quality Technology*.

Miao Cai, E. Liu, et al. ”Profiling In-hospital Mortalities of Rural and Urban Hospitals in Shanxi China: A Bayesian Mixed Effects Model”. Working

Package development

R Package: *MiaoCom*. A R package for calculating comorbidity indexes (i.e. Charlson Comorbidity Index, Elixhauser Comorbidity Index, and C3 Index) for epidemiologists. Source: <https://github.com/caimiao0714/MiaoCom>

Website development and maintenance

Supplementary materials for ”Bridging the Gap between Transportation Safety Research and its Incorporation in Optimization Models: a Detailed Review and Perspective”, a manuscript submitted to *Transportation Research Part C: Emerging Technologies*. Source: <https://caimiao0714.github.io/TrafficSafetyReviewRmarkdown/>

Service to the profession

Referees for *International Journal for Equity in Health*, *BMJ Open*.

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<http://nitens.org/taraborelli/cvtex>

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