



## Suzanne Tamang

Assistant Professor of Medicine (Immunology and Rheumatology)

Medicine - Immunology & Rheumatology

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### Bio

#### BIO

Dr. Suzanne Tamang is an Assistant Professor in the Department of Medicine, Division of Immunology and Rheumatology and a Faculty Fellow at the Stanford Center for Population Health Sciences. She is also the Computation Systems Evaluation Lead at the VA Office of Mental Health and Suicide Prevention's Program Evaluation Resource Center. Dr. Tamang uses her training in biology, computer science, health services research and biomedical informatics to work with interdisciplinary teams of experts on population health problems of public interest. Integral to her research, is the analysis of large and complex population-based datasets, using techniques from natural language processing, machine learning and deep learning. Her expertise spans US and Danish population-based registries, Electronic Medical Records from various vendors, administrative healthcare claims and other types of observational health and demographic data sources in the US and internationally; also, constructing, populating and applying knowledge-bases for automated reasoning. Dr. Tamang has developed open-source tools for the extraction of health information from unstructured free-text clinical progress notes and licensed machine learning prediction models to Silicon Valley health analytics startups. She is the faculty mentor for the Stanford community working group Stats for Social Good.

#### ACADEMIC APPOINTMENTS

- Assistant Professor, Medicine - Immunology & Rheumatology

#### ADMINISTRATIVE APPOINTMENTS

- Faculty Mentor, Stanford Stats for Social Good, (2020- present)
- Computational Systems Evaluation Lead, Program Evaluation Resource Center, Office of Mental Health and Suicide Prevention, VA, (2023- present)
- Faculty Fellow, Center for Population Health Sciences, (2023- present)

#### PROFESSIONAL EDUCATION

- Postdoctoral Training, Stanford School of Medicine , Biomedical Informatics (2015)
- Doctor of Philosophy, Graduate Center, City University of New York (CUNY) , Computer Science (2013)
- Master of Science, Brooklyn College, CUNY , Computer Science and Health Science (2006)
- Bachelor of Science, Brooklyn College, CUNY , Biology

#### LINKS

- My Website: <http://suzannetamang.com/me>

## Teaching

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### COURSES

#### 2025-26

- AI for Human & Planetary Health: MED 25N (Win)

#### 2022-23

- Applied Artificial Intelligence in Health Care: BIOS 244 (Spr)

### STANFORD ADVISEES

#### Postdoctoral Faculty Sponsor

Miranda Chen, Mojtaba Sedigh Fazli

## Publications

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### PUBLICATIONS

- **Vagotomy and the incidence of rheumatoid arthritis and osteoarthritis: a Danish register-based study.** *Arthritis research & therapy*  
Baker, M. C., Nagy, D., Tamang, S., Horváth-Puhó, E., Sørensen, H. T.  
2025; 27 (1): 106
- **Domain Shift Analysis in Chest Radiographs Classification in a Veterans Healthcare Administration Population.** *Journal of imaging informatics in medicine*  
Chandrashekar, M., Goethert, I., Haque, M. I., McMahon, B., Dhaubhadel, S., Knight, K., Erdos, J., Reagan, D., Taylor, C., Kuzmak, P., Gaziano, J. M., McAllister, E., Costa, et al  
2025
- **Drug Overdose Mortality Rates Among Non-Hispanic American Indian/Alaska Native Individuals, 1999-2022.** *Annals of epidemiology*  
Zhu, D. T., Friedman, J., Tamang, S., Gone, J. P.  
2025
- **Computing 3-Step Theory of Suicide Factor Scores From Veterans Health Administration Clinical Progress Notes.** *Suicide & life-threatening behavior*  
Meerwijk, E. L., Shotqara, A. S., Finlay, A. K., Reeves, R. M., Tamang, S. R., Ilgen, M. A., Harris, A. H.  
2025; 55 (1): e70004
- **Refining Chronic Pain Phenotypes: A Comparative Analysis of Sociodemographic and Disease-Related Determinants Using Electronic Health Records.** *The journal of pain*  
Begum, T., Veeranki, B., Chike, O. J., Tamang, S., Simard, J. F., Chen, J., Chaichian, Y., Mackey, S., Darnall, B. D., Falasinnu, T.  
2025: 104775
- **Artificial Intelligence Assisted Interpretation of Lung Ultrasound Imaging for the Detection of Interstitial Lung Disease**  
Fairchild, R., Mar, D., Deluna, M., Baker, M., Tamang, S., Guo, H., Fiorentino, D., Chung, L.  
WILEY.2024: 3994-3996
- **Assessing the PULSAR (Program to Understand the Longterm Outcomes in Spondyloarthritis) Registry for Environmental Determinants of Health Research**  
Stolyar, L., Mar, D., Liu, Y., Velasquez, E., Sharpe, O., Weisman, M., Caplan, L., Tamang, S.  
WILEY.2024: 3817-3819
- **Automated Versus Semi-automated Lab Value Extraction for the VA Cardiac Surgical Quality Improvement Program.** *The Journal of surgical research*  
Harris, A. H., Shotqara, A., Meerwijk, E. L., Tamang, S. R., Eddington, H., Logan, D., Massarweh, N. N.  
2024; 302: 47-52
- **Disparities in Cancer Mortality among Disaggregated Asian American Subpopulations, 2018-2021.** *Journal of racial and ethnic health disparities*

- Zhu, D. T., Lai, A., Park, A., Zhong, A., Tamang, S.  
2024
- **Evaluating accuracy and fairness of clinical decision support algorithms when health care resources are limited.** *Journal of biomedical informatics*  
Meerwijk, E. L., Mcelfresh, D. C., Martins, S., Tamang, S. R.  
2024: 104664
  - **Question-answering system extracts information on injection drug use from clinical notes.** *Communications medicine*  
Mahbub, M., Goethert, I., Danciu, I., Knight, K., Srinivasan, S., Tamang, S., Rozenberg-Ben-Dror, K., Solares, H., Martins, S., Trafton, J., Begoli, E., Peterson, G. D.  
2024; 4 (1): 61
  - **Disaggregating Asian-American Mortality in Drug-Related Overdoses and Behavioral Disorders: A Cross-Sectional Study.** *Journal of racial and ethnic health disparities*  
Zhu, D. T., Zhong, A., Ho, W. J., Tamang, S.  
2024
  - **High dimensional predictions of suicide risk in 4.2 million US Veterans using ensemble transfer learning.** *Scientific reports*  
Dhaubhadel, S., Ganguly, K., Ribeiro, R. M., Cohn, J. D., Hyman, J. M., Hengartner, N. W., Kolade, B., Singley, A., Bhattacharya, T., Finley, P., Levin, D., Thelen, H., Cho, et al  
2024; 14 (1): 1793
  - **Development of a 3-Step theory of suicide ontology to facilitate 3ST factor extraction from clinical progress notes.** *Journal of biomedical informatics*  
Meerwijk, E. L., Jones, G. A., Shotqara, A. S., Reyes, S., Tamang, S. R., Eddington, H. S., Reeves, R. M., Finlay, A. K., Harris, A. H.  
2023: 104582
  - **Deploying a national clinical text processing infrastructure.** *Journal of the American Medical Informatics Association : JAMIA*  
McManus, K. F., Stringer, J. M., Corson, N., Fodeh, S., Steinhart, S., Levin, F. L., Shotqara, A. S., D'Auria, J., Fielstein, E. M., Gobbel, G. T., Scott, J., Trafton, J. A., Taddei, et al  
2023
  - **The Problem of Pain in Rheumatology: Variations in Case Definitions Derived From Chronic Pain Phenotyping Algorithms Using Electronic Health Records.** *The Journal of rheumatology*  
Falasinnu, T., Nguyen, T., En Jiang, T., Tamang, S., Chaichian, Y., Darnall, B. D., Mackey, S., Simard, J. F., Chen, J. H.  
2023
  - **Eliminating Algorithmic Racial Bias in Clinical Decision Support Algorithms: Use Cases from the Veterans Health Administration.** *Health equity*  
List, J. M., Palevsky, P., Tamang, S., Crowley, S., Au, D., Yarbrough, W. C., Navathe, A. S., Kreisler, C., Parikh, R. B., Wang-Rodriguez, J., Klutts, J. S., Conlin, P., Pogach, et al  
2023; 7 (1): 809-816
  - **Vagotomy and Subsequent Risk of Rheumatoid Arthritis and Osteoarthritis: A Danish Register-Based Cohort Study**  
Baker, M., Nagy, D., Tamang, S., Horvath-Puho, E., Sorensen, H.  
WILEY.2023: 1674-1676
  - **Editorial: Artificial intelligence for human function and disability.** *Frontiers in digital health*  
Newman-Griffis, D. R., Desmet, B., Ziriky, A., Tamang, S., Chang, C. H.  
2023; 5: 1282287
  - **The emerging fentanyl-xylazine syndemic in the USA: challenges and future directions.** *Lancet (London, England)*  
Zhu, D. T., Friedman, J., Bourgois, P., Montero, F., Tamang, S.  
2023
  - **A call for better validation of opioid overdose risk algorithms.** *Journal of the American Medical Informatics Association : JAMIA*  
McElfresh, D. C., Chen, L., Oliva, E., Joyce, V., Rose, S., Tamang, S.  
2023
  - **Promises and perils of the FDA's over-the-counter naloxone reclassification.** *Lancet regional health. Americas*

- Zhu, D. T., Tamang, S., Humphreys, K.  
2023; 23: 100518
- **Sarcoidosis rates in BCG-vaccinated and unvaccinated young adults: A natural experiment using Danish registers.** *Seminars in arthritis and rheumatism*  
Baker, M. C., Vágó, E., Tamang, S., Horváth-Puhó, E., Sørensen, H. T.  
2023; 60: 152205
  - **Practical Considerations for Developing Clinical Natural Language Processing Systems for Population Health Management and Measurement.** *JMIR medical informatics*  
Tamang, S., Humbert-Droz, M., Gianfrancesco, M., Izadi, Z., Schmajuk, G., Yazdany, J.  
2023; 11: e37805
  - **MediSage: An AI Assistant for Healthcare via Composition of Neural-Symbolic Reasoning Operators**  
Choudhury, S., Agarwal, K., Ham, C., Tamang, S., ACM  
ASSOC COMPUTING MACHINERY.2023: 258-261
  - **Revelations from a Machine Learning Analysis of the Most Downloaded Articles Published in Journal of Palliative Medicine 1999-2018.** *Journal of palliative medicine*  
Tamang, S., Jin, Z., Periyakoil, V. S.  
2023; 26 (1): 13-16
  - **cpqQA: A Benchmark Dataset for Machine Reading Comprehension Tasks on Clinical Practice Guidelines and a Case Study Using Transfer Learning** *IEEE ACCESS*  
Mahbub, M., Begoli, E., Martins, S., Peluso, A., Tamang, S., Peterson, G.  
2023; 11: 3691-3705
  - **Development and validation of MedDRA Tagger: a tool for extraction and structuring medical information from clinical notes.** *medRxiv : the preprint server for health sciences*  
Humbert-Droz, M., Corley, J., Tamang, S., Gevaert, O.  
2022
  - **Sarcoidosis incidence after mTOR inhibitor treatment.** *Seminars in arthritis and rheumatism*  
Baker, M. C., Vago, E., Liu, Y., Lu, R., Tamang, S., Horvath-Puho, E., Sorensen, H. T.  
2022; 57: 152102
  - **Sarcoidosis in patients after solid organ transplantation treated with mtor inhibitors versus calcineurin inhibitors**  
Vago, E. K., Baker, M. C., Tamang, S., Sorensen, H., Horvath-Puho, E.  
WILEY.2022: 263-264
  - **Sarcoidosis Rates in BCG-Vaccinated and Unvaccinated Young Adults: A Danish Register-Based Study**  
Baker, M., Vago, E., Tamang, S., Horvath-Puho, E., Sorensen, H.  
WILEY.2022: 2207-2208
  - **Application of Natural Language Processing to Identify Varicella Zoster Infection in Clinical Notes**  
Ho, A., Izadi, Z., Schmajuk, G., Yazdany, J., Tamang, S., Gianfrancesco, M.  
WILEY.2022: 1455-1457
  - **Sarcoidosis Incidence After mTOR Inhibitor Treatment**  
Baker, M., Vago, E., Liu, Y., Lu, R., Tamang, S., Horvath-Puho, E., Sorensen, H.  
WILEY.2022: 254-256
  - **Suicide theory-guided natural language processing of clinical progress notes to improve prediction of veteran suicide risk: protocol for a mixed-method study.** *BMJ open*  
Meerwijk, E. L., Tamang, S. R., Finlay, A. K., Ilgen, M. A., Reeves, R. M., Harris, A. H.  
2022; 12 (8): e065088
  - **Preparing for the next pandemic via transfer learning from existing diseases with hierarchical multi-modal BERT: a study on COVID-19 outcome prediction.** *Scientific reports*  
Agarwal, K., Choudhury, S., Tipirneni, S., Mukherjee, P., Ham, C., Tamang, S., Baker, M., Tang, S., Kocaman, V., Gevaert, O., Rallo, R., Reddy, C. K.  
2022; 12 (1): 10748

- **A case for developing domain-specific vocabularies for extracting suicide factors from healthcare notes.** *Journal of psychiatric research*  
Morrow, D., Zamora-Resendiz, R., Beckham, J. C., Kimbrel, N. A., Oslin, D. W., Tamang, S., Million Veteran Program Suicide Exemplar Work Group, Crivelli, S.  
2022; 151: 328-338
- **Development of a natural language processing system for extracting rheumatoid arthritis outcomes from clinical notes using the national RISE registry.** *Arthritis care & research*  
Humbert-Droz, M., Izadi, Z., Schmajuk, G., Gianfrancesco, M., Baker, M. C., Yazdany, J., Tamang, S.  
2022
- **Unstructured clinical notes within the 24 hours since admission predict short, mid & long-term mortality in adult ICU patients.** *PloS one*  
Mahbub, M., Srinivasan, S., Danciu, I., Peluso, A., Begoli, E., Tamang, S., Peterson, G. D.  
1800; 17 (1): e0262182
- **Natural Language Processing Tool for Extraction of Patient-Reported Outcomes from a National Multi-Electronic Health Records Registry**  
Humbert-Droz, M., Izadi, Z., Schmajuk, G., Gianfrancesco, M., Yazdany, J., Tamang, S.  
WILEY.2021: 3955-3957
- **Association of alpha1-Blocker Receipt With 30-Day Mortality and Risk of Intensive Care Unit Admission Among Adults Hospitalized With Influenza or Pneumonia in Denmark.** *JAMA network open*  
Thomsen, R. W., Christiansen, C. F., Heide-Jorgensen, U., Vogelstein, J. T., Vogelstein, B., Bettegowda, C., Tamang, S., Athey, S., Sorensen, H. T.  
2021; 4 (2): e2037053
- **Ten Rules for Conducting Retrospective Pharmacoepidemiological Analyses: Example COVID-19 Study.** *Frontiers in pharmacology*  
Powell, M., Koenecke, A., Byrd, J. B., Nishimura, A., Konig, M. F., Xiong, R., Mahmood, S., Mucaj, V., Bettegowda, C., Rose, L., Tamang, S., Sacarny, A., Caffo, et al  
2021; 12: 700776
- **Application of Text Mining Methods to Identify Lupus Nephritis from Electronic Health Records**  
Gianfrancesco, M., Tamang, S., Schmajuk, G., Yazdany, J.  
WILEY.2020
- **Risk of primary urological and genital cancers following incident breast cancer: a Danish population-based cohort study.** *Breast cancer research and treatment*  
Sundboll, J., Farkas, D. K., Adelborg, K., Schapira, L., Tamang, S., Norgaard, M., Cullen, M. R., Cronin-Fenton, D., Sorensen, H. T.  
2020
- **A Machine Learning Approach to Identifying Changes in Suicidal Language.** *Suicide & life-threatening behavior*  
Pestian, J., Santel, D., Sorter, M., Bayram, U., Connolly, B., Glauser, T., DelBello, M., Tamang, S., Cohen, K.  
2020
- **Risk of primary gastrointestinal cancers following incident non-metastatic breast cancer: a Danish population-based cohort study.** *BMJ open gastroenterology*  
Adelborg, K., Farkas, D. K., Sundboll, J., Schapira, L., Tamang, S., Cullen, M. R., Cronin-Fenton, D., Sorensen, H. T.  
2020; 7 (1)
- **The incidence of hematologic cancers after breast cancer. A 35-year population-based cohort study in Denmark**  
Hjorth, C., Farkas, D., Schapira, L., Tamang, S., Cullen, M., Sorensen, H., Cronin-Fenton, D.  
WILEY.2019: 75
- **Risk of primary urological and genital cancers following incident breast cancer: A Danish population-based cohort study**  
Sundboll, J., Farkas, D., Schapira, L., Tamang, S., Norgaard, M., Cullen, M., Cronin-Fenton, D., Sorensen, H. T.  
WILEY.2019: 79
- **Risk of primary gastrointestinal cancers following incident breast cancer: A Danish population-based cohort study**  
Adelborg, K., Farkas, D. K., Schapira, L., Tamang, S., Fenton, D. C., Cullen, M., Sorensen, H. T.  
WILEY.2019: 81
- **Stress Disorders and Dementia in the Danish Population** *AMERICAN JOURNAL OF EPIDEMIOLOGY*  
Gradus, J. L., Horvath-Puho, E., Lash, T. L., Ehrenstein, V., Tamang, S., Adler, N. E., Milstein, A., Glymour, M., Henderson, V. W., Sorensen, H. T.

2019; 188 (3): 493–99

- **Using natural language processing to construct a metastatic breast cancer cohort from linked cancer registry and electronic medical records data.** *JAMIA open*  
Ling, A. Y., Kurian, A. W., Caswell-Jin, J. L., Sledge, G. W., Shah, N. H., Tamang, S. R.  
2019; 2 (4): 528–37
- **Stress Disorders and Dementia in the Danish Population.** *American journal of epidemiology*  
Gradus, J. L., Horvath-Puho, E., Lash, T. L., Ehrenstein, V., Tamang, S., Adler, N. E., Milstein, A., Glymour, M. M., Henderson, V. W., Sorensen, H. T.  
2018
- **Potential Biases in Machine Learning Algorithms Using Electronic Health Record Data** *JAMA INTERNAL MEDICINE*  
Gianfrancesco, M. A., Tamang, S., Yazdany, J., Schmajuk, G.  
2018; 178 (11): 1544–47
- **Scalable Electronic Phenotyping For Studying Patient Comorbidities.** *AMIA ... Annual Symposium proceedings. AMIA Symposium*  
Ling, A. Y., Alsentzer, E., Chen, J., Banda, J. M., Tamang, S., Minty, E.  
2018; 2018: 740–49
- **SynthNotes: A Generator Framework for High-volume, High-fidelity Synthetic Mental Health Notes**  
Begoli, E., Brown, K., Srinivas, S., Tamang, S.  
edited by Abe, N., Liu, H., Pu, C., Hu, Ahmed, N., Qiao, M., Song, Y., Kossmann, D., Liu, B., Lee, K., Tang, J., He, J., Saltz, J.  
IEEE.2018: 951–58
- **Performance of Machine Learning Methods Using Electronic Medical Records to Predict Varicella Zoster Virus Infection**  
Gianfrancesco, M., Schmajuk, G., Murray, S., Ludwig, D., Hannun, A., Avati, A., Tamang, S., Yazdany, J.  
WILEY.2017
- **Predicting patient 'cost blooms' in Denmark: a longitudinal population-based study.** *BMJ open*  
Tamang, S., Milstein, A., Sørensen, H. T., Pedersen, L., Mackey, L., Betterton, J., Janson, L., Shah, N.  
2017; 7 (1)
- **Enhanced Quality Measurement Event Detection: An Application to Physician Reporting.** *EGEMS (Washington, DC)*  
Tamang, S. R., Hernandez-Boussard, T. n., Ross, E. G., Gaskin, G. n., Patel, M. I., Shah, N. H.  
2017; 5 (1): 5
- **New Paradigms for Patient-Centered Outcomes Research in Electronic Medical Records: An Example of Detecting Urinary Incontinence Following Prostatectomy.** *EGEMS (Washington, DC)*  
Hernandez-Boussard, T., Tamang, S., Blayney, D., Brooks, J., Shah, N.  
2016; 4 (3): 1231-?
- **Detecting unplanned care from clinician notes in electronic health records.** *Journal of oncology practice / American Society of Clinical Oncology*  
Tamang, S., Patel, M. I., Blayney, D. W., Kuznetsov, J., Finlayson, S. G., Vetteth, Y., Shah, N.  
2015; 11 (3): e313-9
- **Text Mining for Adverse Drug Events: the Promise, Challenges, and State of the Art** *DRUG SAFETY*  
Harpaz, R., Callahan, A., Tamang, S., Low, Y., Odgers, D., Finlayson, S., Jung, K., LePendur, P., Shah, N. H.  
2014; 37 (10): 777-790