Selen Bozkurt

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RESEARCH INTERESTS

Analyzing multiple types of real-world health data (e.g., EHR, Claims, Patient generated data) to answer clinical questions, generate insights, and build predictive models using machine learning and natural language processing.

Development of methods and frameworks to evaluate and mitigate bias in AI for health-care.

ACADEMIC BACKGROUND

Ph.D. Medical Informatics

2015

Akdeniz University, Antalya, Turkey Stanford University, Stanford, CA

2012-2014

• Ph.D. research in clinical natural language processing and machine learning under direction of Prof. Daniel L. Rubin and Prof. Kemal Hakan Gulkesen.

Pre-doctoral Study

2008-2009

Technical Team Member, Structured Radiology Report Initiative of RSNA Radiology Reporting Initiative under direction of Prof. Charles E. Kahn.

M.Sc. Biostatistics and Medical Informatics

2008

Akdeniz University, Antalya, Turkey

• Focus areas: electronic health records, personal health records, clinical decision support and usability evaluation.

B.Sc. Statistics 2005
Dokuz Eylul University, Izmir, Turkey

EMPLOYMENT HISTORY

Incoming Assistant Professor Sep	otember 2023
Emory University, Atlanta, GA	
Senior Research/Data Scientist 2	022 - Present
Stanford University, Stanford, CA	
Consultant, Machine Learning 2	022 - Present
Flatiron Health, New York, NY	
Manager, Senior Quantitative Scientist	2021 - 2022
Flatiron Health, New York, NY	
Research Scientist/Lab Manager	2020 - 2021
Stanford University, Biomedical Informatics, Stanford, CA	
Biomedical Informatician	2019 - 2020
Stanford University, Biomedical Informatics, Stanford, CA	
Post-Doctoral Scholar	2018 - 2019
Stanford University, Biomedical Data Science, Stanford, CA	
Collaborating Faculty	2015 - 2017
Stanford University, Laboratory of Quantitative Imaging, Stanford, CA	
Lecturer	2015 - 2017
Akdeniz University, Department of Biostatistics and Medical Informatics	, Turkey
Research and Teaching Assistant	2005 - 2015
Akdeniz University, Department of Biostatistics and Medical Informatics	, Turkey

PROFESSIONAL Awards and Fellowships

ACTIVITIES

- National Title Award, First ever Associate Professor of Health Informatics in Turkey, Government of Education, Turkey (2020)
- Early-Career Research Fellowship, Scientific and Technological Research Council of Turkey (2018)
- National Academic Incentive Grant, Highest score (100) in Nationwide Annual Evaluation, Council of Higher Education Turkey (2017)
- International Doctoral Research Fellowship, The Scientific and Technological Research Council of Turkey (TUBITAK), Program 2214 (March 2012 March 2013)
- International Pre-Doctoral Research Fellowship, Akdeniz University Scientific Research Council, Turkey (Feb 2008 Jan 2009)

Grants

• Principal Investigator

2017-2018

Title: Development and Evaluation of a Prediction Model for Presence of Extrauterine Disease in Endometrial Cancer Patients: A Decision Curve Analysis Funding Source: Higher Education Institutions, Turkey.

Principal Investigator
 2016-2017

 Title: Estimation of Obstructive Sleep Apnea Severity Using Additive Bayesian Networks. Funding Source: Akdeniz University Scientific Research Council, Turkey.

Activities

- Invited Speaker PharML 2022 Lung Cancer Survival Prediction Challenge, ECML-PKDD, Grenoble, France, 2022
- Participant in Women in AMIA Leadership Program, 2021 2022
- Invited Speaker Women in Data Science Istanbul, Turkey, 2021
- Organizing Committee Member, International Conference on Information Management and Big Data (SIMBig) 2020, 2021
- Participant EDUC 343C: Preparing for Faculty Careers, Stanford University 2019
- Organizer and Speaker, DDAMES: Data Divas for AI in Medicine, Monthly Workshop, Stanford University, 2019 2020
- Secretary, Turkish Medical Informatics Association (TurkMIA), 2016-2018
- \bullet Organizing Committee Secretary 25th European Medical Informatics Conference MIE2014
- Project Member, EU Framework 7 (FP7) Specific Program Marie Curie Actions, New Horizons Biomedical Informatics Observatories in Mediterranean Region (BIOMed) Grant Agreement Number: 318905 (Egypt, Jordan, Spain, Greece, Turkey), 2013

Service

- Reviewer for all the following proceedings and journals:
 Journal of American Medical Informatics Association, BMC Medical Research
 Methodology, Journal of Medical Systems, BMC Medical Informatics and De cision Making, Computers in Biology and Medicine, BMC Medical Informatics
 and Decision Making, JCO Clinical Cancer Informatics, MIE Conferences, AMIA
 Conferences
- Guest Editor, Special Issue: Natural Language Processing in Healthcare, Applied Sciences (ISSN 2076-3417), 2023

- Guest Editor, Special Issue: Artificial Intelligence and Data Science applied to Bioengineering, AIMS Bioengineering, 2021
- Review Editor, Frontiers in Artificial Intelligence, Frontiers in Big Data, Frontiers in Digital Health, 2021

TEACHING

• Introduction to Medical Informatics, Akdeniz University, Faculty of Medicine, Antalya, Turkey	2016-2017
• Biostatistics Akdeniz University, Faculty of Medicine, Antalya, Turkey	2016-2017
• Statistics for Scientific Research Akdeniz University, Faculty of Medicine, Antalya, Turkey	2015-2016
• Nursing Informatics Akdeniz University, Faculty of Medicine, Antalya, Turkey	2015-2016

PUBLICATIONS

* Journal Articles

- [J1] **Selen Bozkurt**, Christopher J Magnani, Martin G Seneviratne, James D Brooks, and Tina Hernandez-Boussard. Expanding the secondary use of prostate cancer real world data: Automated classifiers for clinical and pathological stage. *Frontiers in digital health*, 4, 2022.
- [J2] Eliane Röösli, **Selen Bozkurt**, and Tina Hernandez-Boussard. Peeking into a black box, the fairness and generalizability of a MIMIC-III benchmarking model. *Scientific Data*, 9(1):1–13, 2022.
- [J3] Perrin Jhaveri, **Selen Bozkurt**, Axel Moyal, Artur Belov, Steven Anderson, Hua Shan, Barbee Whitaker, and Tina Hernandez-Boussard. Analyzing real world data of blood transfusion adverse events: Opportunities and challenges. *Transfusion*, 62(5):1019–1026, 2022.
- [J4] Melissa Estevez, Corey M Benedum, Chengsheng Jiang, Aaron B Cohen, Sharang Phadke, Somnath Sarkar, and Selen Bozkurt. Considerations for the use of machine learning extracted real-world data to support evidence generation: A research-centric evaluation framework. Cancers, 14(13):3063, 2022.
- [J5] Ran Sun, Selen Bozkurt, Marcy Winget, Mark R Cullen, Tina Seto, and Tina Hernandez-Boussard. Characterizing patient flow after an academic hospital merger and acquisition. The American Journal of Managed Care, 27(10):e343– e348, 2021.
- [J6] Jean Coquet, Nicolas Bievre, Vincent Billaut, Martin Seneviratne, Christopher J Magnani, Selen Bozkurt, James D Brooks, and Tina Hernandez-Boussard. Assessment of a clinical trial-derived survival model in patients with metastatic castration-resistant prostate cancer. JAMA network open, 4(1):e2031730-e2031730, 2021.
- [J7] Amee D Azad, Melih Yilmaz, Selen Bozkurt, James D Brooks, Douglas W Blayney, and Tina Hernandez-Boussard. Diverse patient trajectories during cytotoxic chemotherapy: Capturing longitudinal patient-reported outcomes. Cancer medicine, 10(17):5783–5793, 2021.
- [J8] **Selen Bozkurt**, Rohan Paul, Jean Coquet, Ran Sun, Imon Banerjee, James D Brooks, and Tina Hernandez-Boussard. Phenotyping severity of patient-centered outcomes using clinical notes: A prostate cancer use case. *Learning Health Systems*, 4(4):e10237, 2020.

- [J9] Selen Bozkurt, Eli M Cahan, Martin G Seneviratne, Ran Sun, Juan A Lossio-Ventura, John Ioannidis, and Tina Hernandez-Boussard. Reporting of demographic data and representativeness in machine learning models using electronic health records. *Journal of the American Medical Informatics Association*, 27(12):1878–1884, 2020.
- [J10] Tina Hernandez-Boussard, Selen Bozkurt, John PA Ioannidis, and Nigam H Shah. MINIMAR(MINimum Information for Medical AI Reporting): developing reporting standards for artificial intelligence in health care. *Journal of the* American Medical Informatics Association, 27(12):2011–2015, 2020.
- [J11] Douglas W Blayney, Amee Azad, Melih Yilmaz, **Selen Bozkurt**, James D Brooks, and Tina Hernandez-Boussard. Four distinct patient-reported outcome (pro) trajectories in longitudinal responses collected before, during, and after chemotherapy., 2020.
- [J12] Amee D Azad, **Selen Bozkurt**, Amanda J Wheeler, Catherine Curtin, Todd H Wagner, and Tina Hernandez-Boussard. Acute pain after breast surgery and reconstruction: A two-institution study of surgical factors influencing short-term pain outcomes. *Journal of surgical oncology*, 122(4):623–631, 2020.
- [J13] Selen Bozkurt, Tayfun Toptas, Hulya Ayik Aydin, Tayup Simsek, and Yasemin Yavuz. A nomogram for decision-making of completion surgery in endometrial cancer diagnosed after hysterectomy. Archives of Gynecology and Obstetrics, 300(3):693-701, 2019.
- [J14] **Selen Bozkurt**, Kathleen M Kan, Michelle K Ferrari, Daniel L Rubin, Douglas W Blayney, Tina Hernandez-Boussard, and James D Brooks. Is it possible to automatically assess pretreatment digital rectal examination documentation using natural language processing? a single-centre retrospective study. *BMJ open*, 9(7):e027182, 2019.
- [J15] **Selen Bozkurt**, Emel Alkim, Imon Banerjee, and Daniel L Rubin. Automated detection of measurements and their descriptors in radiology reports using a hybrid natural language processing algorithm. *Journal of digital imaging*, 32(4):544–553, 2019.
- [J16] Martin G Seneviratne, Selen Bozkurt, Manali I Patel, Tina Seto, James D Brooks, Douglas W Blayney, Allison W Kurian, and Tina Hernandez-Boussard. Distribution of global health measures from routinely collected promis surveys in patients with breast cancer or prostate cancer. Cancer, 125(6):943–951, 2019.
- [J17] Raphael Lenain, Martin G Seneviratne, **Selen Bozkurt**, Douglas W Blayney, James D Brooks, and Tina Hernandez-Boussard. Machine learning approaches for extracting stage from pathology reports in prostate cancer. *Studies in health technology and informatics*, 264:1522, 2019.
- [J18] Thi T Hang Pham, Thuy X Le, Dong T Nguyen, Chau M Luu, Bac D Truong, Phu D Tran, Mehlika Toy, **Selen Bozkurt**, and Samuel So. Knowledge, attitudes and medical practice regarding hepatitis b prevention and management among healthcare workers in northern vietnam. *PloS one*, 14(10):e0223733, 2019.
- [J19] Jean Coquet, Selen Bozkurt, Kathleen M Kan, Michelle K Ferrari, Douglas W Blayney, James D Brooks, and Tina Hernandez-Boussard. Comparison of orthogonal nlp methods for clinical phenotyping and assessment of bone scan utilization among prostate cancer patients. *Journal of biomedical informatics*, 94:103184, 2019.
- [J20] Imon Banerjee, **Selen Bozkurt**, Jennifer Lee Caswell-Jin, Allison W Kurian, and Daniel L Rubin. Natural language processing approaches to detect the timeline of

- metastatic recurrence of breast cancer. $JCO\ clinical\ cancer\ informatics,\ 3:1-12,\ 2019.$
- [J21] Imon Banerjee, Selen Bozkurt, Emel Alkim, Hersh Sagreiya, Allison W Kurian, and Daniel L Rubin. Automatic inference of bi-rads final assessment categories from narrative mammography report findings. *Journal of biomedical informatics*, 92:103137, 2019.
- [J22] Tayfun Toptaş, Elif Peştereli, **Selen Bozkurt**, Gülgün Erdoğan, and Tayup Şimşek. Relationships of nuclear, architectural and international federation of gynecology and obstetrics grading systems in endometrial cancer. *Journal of the Turkish German Gynecological Association*, 19(1):17, 2018.
- [J23] Bethany Percha, Yuhao Zhang, **Selen Bozkurt**, Daniel Rubin, Russ B Altman, and Curtis P Langlotz. Expanding a radiology lexicon using contextual patterns in radiology reports. *Journal of the American Medical Informatics Association*, 25(6):679–685, 2018.
- [J24] Asli Bostanci, **Selen Bozkurt**, and Murat Turhan. Impact of age on intermittent hypoxia in obstructive sleep apnea: a propensity-matched analysis. *Sleep and Breathing*, 22(2):317–322, 2018.
- [J25] **Selen Bozkurt**, Asli Bostanci, and Murat Turhan. Can statistical machine learning algorithms help for classification of obstructive sleep apnea severity to optimal utilization of polysomno graphy resources? *Methods of information in medicine*, 56(04):308–318, 2017.
- [J26] Yi Hong, Ying Zhu, Selen Bozkurt, Jin Zhang, and Charles E Kahn Jr. Usability study of rsna radiology reporting template library. Studies in Health Technology and Informatics, 245:1325–1325, 2017.
- [J27] Murat Turhan, Asli Bostanci, and Selen Bozkurt. Estimation of cardiovascular disease from polysomnographic parameters in sleep-disordered breathing. European Archives of Oto-Rhino-Laryngology, 273(12):4585-4593, 2016.
- [J28] Tayfun Toptas, Elif Pestereli, Onur Erol, **Selen Bozkurt**, Gulgun Erdogan, and Tayup Simsek. Validation of revised figo staging classification for cancer of the ovary, fallopian tube, and peritoneum based on a single histological type. *International Journal of Gynecologic Cancer*, 26(6), 2016.
- [J29] Tayfun Toptas, Alper Karalok, Isin Ureyen, Tolga Tasci, Onur Erol, **Selen Bozkurt**, Gokhan Tulunay, Tayup Simsek, and Taner Turan. Liver recurrence in endometrial cancer: a multi-institutional analysis of factors predictive of postrecurrence survival. *Clinical & experimental metastasis*, 33(7):707–715, 2016.
- [J30] Selen Bozkurt, Francisco Gimenez, Elizabeth S Burnside, Kemal H Gulkesen, and Daniel L Rubin. Using automatically extracted information from mammography reports for decision-support. *Journal of biomedical informatics*, 62:224–231, 2016.
- [J31] Asli Bostanci, Selen Bozkurt, and Murat Turhan. The relationship between the duration of obstructive respiratory events and outcomes of multilevel upper airway surgery in patients with obstructive sleep apnea. European Archives of Oto-Rhino-Laryngology, 273(9):2651–2657, 2016.
- [J32] Murat Turhan, Asli Bostanci, and **Selen Bozkurt**. Predicting the outcome of modified tongue base suspension combined with uvulopalatopharyngoplasty. *European Archives of Oto-Rhino-Laryngology*, 272(11):3411–3416, 2015.
- [J33] **Selen Bozkurt**, Jafi A Lipson, Utku Senol, and Daniel L Rubin. Automatic abstraction of imaging observations with their characteristics from mammography reports. *Journal of the American Medical Informatics Association*, 22(e1):e81–e92, 2015.

- [J34] Cem Yasar Sanhal, Inanc Mendilcioglu, Murat Ozekinci, Mehmet Simsek, and **Selen Bozkurt**. Comparison of pre-procedural anxiety and depression scores for patients undergoing chorion villus sampling and amniocentesis: An alternative perspective on prenatal invasive techniques. *Pakistan journal of medical sciences*, 31(5):1038, 2015.
- [J35] Ebru Özpelit, Bahri Akdeniz, Mehmet Emre Özpelit, Sedat Tas, Selen Bozkurt, Kemal Can Tertemiz, Can Sevinç, and Özer Badak. Prognostic value of neutrophilto-lymphocyte ratio in pulmonary arterial hypertension. *Journal of International Medical Research*, 43(5):661–671, 2015.
- [J36] Asli Bostanci, Murat Turhan, and **Selen Bozkurt**. Factors influencing sleep time with oxygen saturation below 90% in sleep-disordered breathing. *The Laryn-goscope*, 125(4):1008–1012, 2015.
- [J37] Yilmaz Kemal Yuce, Nese Zayim, Basak Oguz, Selen Bozkurt, Filiz Isleyen, and K Hakan Gulkesen. Analysis of social networks among physicians employed at a medical school. In e-Health-For Continuity of Care, pages 543–547. IOS Press, 2014.
- [J38] **Selen Bozkurt** and Daniel Rubin. Automated detection of ambiguity in bi-rads assessment categories in mammography reports. In *Cross-Border Challenges in Informatics with a Focus on Disease Surveillance and Utilising Big Data*, pages 35–39. IOS Press, 2014.
- [J39] Ugur Bilge, **Selen Bozkurt**, and Sedat Durmaz. Application of data mining techniques for detecting asymptomatic carotid artery stenosis. *Computers & Electrical Engineering*, 39(5):1499–1505, 2013.
- [J40] **Selen Bozkurt** and Charles E Kahn. An open-standards grammar for outline-style radiology report templates. *Journal of digital imaging*, 25(3):359–364, 2012.
- [J41] Selen Bozkurt, Neşe Zayim, Kemal Hakan Gulkesen, Mehmet Kemal Samur, Nilgun Karaağaoglu, and Osman Saka. Usability of a web-based personal nutrition management tool. *Informatics for Health and Social Care*, 36(4):190–205, 2011.
- [J42] Anıl Aktaş, **Selen Bozkurt**, Neşe Zayim, Osman Saka, and Mehmet Yardimsever. Icd-10 in a university hospital from the physicians' perspective. 2008.

Conferences

- [C1] A Sondhi, CM Benedum, AB Cohen, S Nemeth, and Bozkurt, Selen. Can ML-Extracted variables reproduce real-world comparative effectiveness results from expert-abstracted data? a case study in metastatic non-small cell lung cancer treatment. 6-9 November 2022.
- [C2] CM Benedum, B Adamson, AB Cohen, M Estevez, A Sondhi, E Fidyk, S Nemeth, and Bozkurt, Selen. Machine learning-accelerated outcomes research: A case study of cancer biomarker associated survival. ISPOR EU, (Selected among top 5% finalist for ISPOR EU 2022 research presentation awards), 6-9 November 2022.
- [C3] Mohana Roy, Sarah Rosenthal, Manan P Shah, Ali Raza Khaki, Bozkurt, Selen, Tina Seto, Douglas W Blayney, Tina Hernandez-Boussard, and Kavitha Ramchandran. Association of treatment type with patient-reported quality of life in cancer distress screening. American Society of Clinical Oncology, 2021.
- [C4] Dylan Joseph Peterson, Nicolai Patrick Ostberg, Bozkurt, Selen, James D Brooks, Douglas W Blayney, and Tina Hernandez-Boussard. Hsr21-068: Predicting preventable emergency department visits and admissions after chemotherapy. volume 19, pages HSR21-068. National Comprehensive Cancer Network, 2021.

- [C5] Christopher J Magnani, Axel Moyal, Beril Erdogdu, Dylan J Peterson, Bozkurt, Selen, Tina Hernandez-Boussard, and James D Brooks. Mp62-07 real-world validation and generalizability of a psak prediction tool for active surveillance reclassification. volume 206, pages e1094–e1095. Wolters Kluwer Philadelphia, PA, 2021.
- [C6] Bozkurt, Selen, Eli Cahan, Martin Seneviratne, Ran Sun, Juan Lossio-Ventura, John Ioannidis, and Tina Hernandez-Boussard. Reporting of demographic data, representativeness and transparency in machine learning models using electronic health records. In 2020 Virtual Annual Research Meeting. AcademyHealth, 2020.
- [C7] Douglas W Blayney, Amee Azad, Melih Yilmaz, Bozkurt, Selen, James D Brooks, and Tina Hernandez-Boussard. Four distinct patient-reported outcome (pro) trajectories in longitudinal responses collected before, during, and after chemotherapy. American Society of Clinical Oncology, 2020.
- [C8] Raphael Lenain, Martin G Seneviratne, Bozkurt, Selen, Douglas W Blayney, James D Brooks, and Tina Hernandez-Boussard. Machine learning approaches for extracting stage from pathology reports in prostate cancer. Studies in health technology and informatics, 264:1522, 2019.
- [C9] Tina Hernandez-Boussard, Martin Seneviratne, Douglas Blayney, James Brooks, Bozkurt, Selen, and Allison Kurian. Distribution of global health measures in breast and prostate cancer patients: Identifying gaps in ascertainment. In APHA's 2019 Annual Meeting and Expo (Nov. 2-Nov. 6). APHA, 2019.
- [C10] Bozkurt, Selen, Jung In Park, Kathleen Mary Kan, Michelle Ferrari, Daniel L Rubin, James D Brooks, and Tina Hernandez-Boussard. An automated feature engineering for digital rectal examination documentation using natural language processing. In AMIA Annual Symposium Proceedings, volume 2018, page 288. American Medical Informatics Association, 2018.
- [C11] Bozkurt, Selen, A Bostanci, and M Turhan. Estimation of obstructive sleep apnea severity using additive bayesian networks. In *JOURNAL OF SLEEP* RESEARCH, volume 27. WILEY 111 River St, Hoboken 07030-5774, NJ USA, 2018.
- [C12] Kevin Li, Christopher J Magnani, Bozkurt, Selen, Tina Seto, Douglas W Blayney, James D Brooks, and Tina Hernandez-Boussard. Practice-based evidence for factors associated with urinary incontinence following prostate cancer care. American Society of Clinical Oncology, 2018.
- [C13] Dina Vishnyakova, Christophe Gaudet-Blavignac, Bozkurt, Selen, David-Zacharie Issom, Renat Vishnyakov, and Christian Lovis. Report on the ntcir-12 mednlpdoc task results. In NTCIR, 2016.
- [C14] T Toptas, E Pestereli, T Simsek, Bozkurt, Selen, G Erdogan, and S Karaveli. The clinical impact of serous tubal intraepithelial carcinoma on outcomes of patients with pelvic serous carcinoma. In *International journal of gynecological cancer*, volume 25, pages 558–559. Lippincott Williams & Wilkins Two commerce sq. 2001 Market st, Philadelphia . . . , 2015.
- [C15] T Toptas, E Pestereli, O Erol, **Bozkurt, Selen**, G Erdogan, and T Simsek. Validation of revised figo staging classification for cancer of the ovary, fallopian tube, and peritoneum based on a single histologic type. In *International journal of gynecological cancer*, volume 25, pages 1513–1514. Lippincott Williams & Wilkins Two commerce sq. 2001 Market st, Philadelphia . . . , 2015.
- [C16] Yilmaz Kemal Yuce, Nese Zayim, Basak Oguz, Bozkurt, Selen, Filiz Isleyen, and K Hakan Gulkesen. Analysis of social networks among physicians employed

- at a medical school. In e-Health–For Continuity of Care, pages 543–547. IOS Press, 2014.
- [C17] **Bozkurt, Selen** and Daniel L Rubin. Extracting imaging observation entities in mammography reports. In *Medial Informatics Europe*, page 1223. MIE, 2014.
- [C18] Bozkurt, Selen and Daniel Rubin. Automated detection of ambiguity in bi-rads assessment categories in mammography reports. In Cross-Border Challenges in Informatics with a Focus on Disease Surveillance and Utilising Big Data, pages 35–39. IOS Press, 2014.
- [C19] Bozkurt, Selen, Kemal Hakan Gülkesen, and Daniel L Rubin. Annotation for information extraction from mammography reports. volume 2013, pages 183–5, 2013.
- [C20] Ugur Bilge, Bozkurt, Selen, Basak Oguz Yolcular, and Deniz Ozel. Can social web help detect influenza related illnesses in Turkey? volume 174, pages 100–104. EFMI STC, Moscow, Russia, April 2012.
- [C21] Bozkurt, Selen, Asli Uyar, and Kemal Hakan Gulkesen. Comparison of bayesian network and binary logistic regression methods for prediction of prostate cancer. In 2011 4th International Conference on Biomedical Engineering and Informatics (BMEI), volume 3, pages 1689–1691. IEEE, 2011.
- [C22] Bozkurt, Selen, Neşe Zayim, Kemal Hakan Gülkesen, and Mehmet Kemal Samur. Web based personal nutrition management tool. In *International Con*ference on Electronic Healthcare, pages 161–166. Springer, Berlin, Heidelberg, 2008.