

NATHANIEL HENDRIX

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Harvard T.H. Chan School of Public Health
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ACADEMIC POSITIONS

Harvard University, T.H. Chan School of Public Health, Department of Global Health & Population
Postdoctoral Research Fellow, 2020 – Present

University of Washington, The Comparative Health Outcomes, Policy & Economics Institute
Research and Teaching Assistant, 2016 – 2020

EDUCATION

Ph.D. Health Economics and Outcomes Research, University of Washington, 2020.

Dissertation Title: “Using Health Economics Tools to Enhance the Clinical Utility of Artificial Intelligence-Based Diagnostics: A Case Study in Breast Cancer Screening”

Committee: David L. Veenstra (chair), Aasthaa Bansal, Brett Hauber, Christoph I. Lee

Pharm.D., University of Washington, 2015.

B.A. English Literature, Texas State University, 2004.

RESEARCH INTERESTS

Health Economics, Cost-Effectiveness Methods, Cancer Screening, Clinical Artificial Intelligence

PEER-REVIEWED PUBLICATIONS

** indicates co-first author*

1. (*Under review.*) S. Jiang, P. Mathias, **N. Hendrix**, D.L. Veenstra, and B. Devine. “Customizing value-based methods to prioritize implementation of pharmacogenomic clinical decision support for learning health systems: A cost-utility analysis.”
2. (*Under review.*) **N. Hendrix**, D.L. Veenstra, M. Cheng, N.C. Anderson, and S. Verguet. “Assessing the economic value of clinical artificial intelligence: Challenges and opportunities.”
3. (*In press.*) B. Jiao, R. Gulati, **N. Hendrix**, J.L. Gore, S. Rais-Bahrami, T.M. Morgan, and R. Etzioni. “Modeling the cost-effectiveness of multi-parametric magnetic resonance imaging and urine-based reflex testing before prostate biopsy in men with intermediate prostate-specific antigen levels.” *Value in Health*.
4. (*In press.*) **N. Hendrix**, R. Gulati, B. Jiao, A.K. Kader, S.T. Ryan, and R. Etzioni. “Clarifying the trade-offs of risk-stratified screening for prostate cancer: A cost-effectiveness study.” *American Journal of Epidemiology*.
5. **N. Hendrix**, D.D. Kim, K.S. Patel, and B. Devine (2021). “Differences in the selection of health state utility values by sponsorship in published cost-effectiveness analyses.” *Medical Decision Making*. doi:10.1177/0272989X20985821
6. **N. Hendrix**, B. Hauber, C.I. Lee, A. Bansal, and D.L. Veenstra (2020). “Artificial intelligence in breast cancer screening: Primary care provider preferences.” *Journal of the American Medical Informatics Association*. doi:10.1093/jamia/ocaa292

7. **N. Hendrix**, Z. Marcum, and D.L. Veenstra (2020). “Medication persistence of targeted immunomodulators for plaque psoriasis: A retrospective analysis of a US claims database.” *Pharmacoepidemiology & Drug Safety*. doi:10.1002/pds.5021
8. **N. Hendrix**, D.A. Regier, A. Basu, D.L. Veenstra, J. Chatterjee, D.S. Dhanda, and J.J. Carlson (2020). “Provider preferences for resolving uncertainty and avoiding harms in precision medicine: Results from a discrete choice experiment.” *Personalized Medicine*. doi:10.2217/pme-2020-0018
9. R. Baral, J. Fleming, S. Khan, D. Higgins, **N. Hendrix**, and C. Pecenka (2020). “Inferring antenatal care visit timing in low- and middle-income countries: Methods to inform potential maternal vaccine coverage.” *PLOS One*. doi:10.1371/journal.pone.0237718
10. F. Debellut, **N. Hendrix**, V.E. Pitzer, K.M. Neuzil, D. Constenla, N. Bar-Zeev, A. Marfin, and C. Pecenka (2019). “Forecasting demand for the typhoid conjugate vaccine in low- and middle-income countries.” *Clinical Infectious Diseases*. doi:10.1093/cid/ciy1076
11. **N. Hendrix**, D.A. Ollendorf, R.H. Chapman, A. Loos, S. Liu, V. Kumar, J.A. Linder, S.D. Pearson, and D.L. Veenstra (2018). “Cost-effectiveness of targeted pharmacotherapy for moderate to severe plaque psoriasis.” *Journal of Managed Care & Specialty Pharmacy*. doi:10.18553/jmcp.2018.24.12.1210
12. J.J. Carlson, D.D. Kim, G.F. Guzauskas, C.S. Bennette, D.L. Veenstra, A. Basu, **N. Hendrix**, D.L. Hershman, L. Baker and S.D. Ramsey (2018). “Integrating value of research into NCI Clinical Trials Cooperative Group research review and prioritization: A pilot study.” *Cancer Medicine*. doi:10.1002/cam4.1657
13. F. Debellut*, **N. Hendrix***, J.R. Ortiz, P. Lambach, K.M. Neuzil, N. Bhat, and C. Pecenka (2018). “Forecasting demand for maternal influenza immunization in low- and lower-middle-income countries.” *PLOS One*. doi:10.1371/journal.pone.0199470
14. W.J. Canestaro, **N. Hendrix**, A. Bansal, S.D. Sullivan, B. Devine, and J.J. Carlson (2017). “Favorable and publicly-funded studies are more likely to be published: A systematic review and meta-analysis.” *Journal of Clinical Epidemiology*. doi:10.1016/j.jclinepi.2017.08.004
15. **N. Hendrix**, N. Bar-Zeev, D. Atherly, J. Chikafa, H. Mvula, R. Wachepa, A. Crampin, T. Mhango, C. Mwansambo, R. Heyderman, N. French, N. Cunliffe, and C. Pecenka (2017). “The economic impact of childhood acute gastritis on Malawian families and the healthcare system: A prospective cohort study.” *BMJ Open*. doi:10.1136/bmjopen-2017-017347
16. P.C. Mathias, **N. Hendrix**, W.-J. Wang, K. Keyloun, M. Khelifi, P. Tarczy-Hornoch, and B. Devine (2017). “Characterizing pharmacogenomic-guided medication use with a clinical data repository.” *Clinical Pharmacology & Therapeutics*. doi:10.1002/cpt.611

WORKING PAPERS

1. **N. Hendrix**, A. Bansal, D.S.M. Buist, C.I. Lee, and D.L. Veenstra. “Health outcomes modeling to assess artificial intelligence diagnostics: An application in breast cancer screening.”
2. R. Miles*, **N. Hendrix***, and C.D. Lehman. “Personalization of breast cancer screening intervals using Deep Learning-based risk scores: A cost-effectiveness analysis.”
3. K.P. Lowry*, **N. Hendrix***, W. Lotter, J.G. Elmore, D.S. Hippe, W. Hsu, G. Liao, S. Parsian, A.G. Sorensen, and C.I. Lee. “Radiologist preferences for interface elements of artificial intelligence-augmented mammography interpretation tools.”
4. **N. Hendrix**, X. Jiang Kwete, and S. Verguet. “Economic evaluations of health system strengthening in low- and middle-income countries: A methodological systematic review.”
5. **N. Hendrix** and S. Verguet. “Equitable prioritization of healthcare interventions by weighting outcomes on financial risk protection criteria.”

ABSTRACTS

1. (*Accepted.*) D.L. Veenstra, **N. Hendrix**, C.M. Dolan, K.A. Fisher, D. Lalla, N. Oestreicher, and B. Moy (2021). "Population effectiveness model of the consequences of recurrence despite trastuzumab emtansine (T-DM1) treatment among patients with high risk HER2+ early stage breast cancer in the United States." ASCO Annual Meeting, online (due to COVID-19).
2. (*Accepted.*) S. Jiang, **N. Hendrix**, D.L. Veenstra, P.C. Mathias, and B. Devine (2021). "Implementation of pharmacogenomic clinical decision support alerts in learning health systems: A cost-utility analysis." ISPOR Annual Meeting, online (due to COVID-19).
3. (*Accepted.*) B. Jiao, R. Gulati, **N. Hendrix**, J.L. Gore, S. Rais-Bahrami, J.J. Tosoian, M.W. Kattan, T.M. Morgan, R. Etzioni (2021). "Comparative effectiveness and cost-effectiveness of reflex testing men with intermediate PSA levels: A systematic model-based analysis." ISPOR Annual Meeting, online (due to COVID-19).
4. **N. Hendrix**, B. Hauber, C.I. Lee, A. Bansal, and D.L. Veenstra (2020). "Provider preferences for attributes of artificial intelligence in breast cancer screening: A discrete choice experiment." ASCO Annual Meeting, online (due to COVID-19).
5. **N. Hendrix**, Z. Marcum, and D.L. Veenstra (2019). "Drug survival of targeted therapies for plaque psoriasis: Evidence from a large U.S. claims database." International Conference on Pharmacoepidemiology & Therapeutic Risk Management (ICPE), Philadelphia, Pennsylvania.
6. D. Dhanda, D. Regier, D. Veenstra, A. Basu, J. Saha, **N. Hendrix**, and J.J. Carlson (2018). "What US healthcare providers value in genomic precision medicine: a discrete choice experiment." ISPOR Annual Meeting, Baltimore, Maryland.
7. **N. Hendrix**, B. Adamson, A. Basu, and B. Devine (2018). "Increasing trend toward reporting significant digits in utility weights: Behavior implications of 'flat of the curve' medicine?" ISPOR Annual Meeting, Baltimore, Maryland.
8. J.J. Carlson, D.D. Kim, G. Guzauskas, C. Bennette, D. Hershman, L. Baker, **N. Hendrix**, A. Basu, D.L. Veenstra, and S. Ramsey (2017). "Impact of value of research analyses on SWOG's clinical trial capsule scoring." ASCO Annual Meeting, Chicago, Illinois.
9. **N. Hendrix**, N. Simon, and B. Devine (2017). "Funder effects on reporting of health-state utilities." AcademyHealth Annual Meeting, New Orleans, Louisiana.
10. **N. Hendrix**, D.A. Ollendorf, R. Chapman, A. Loos, S. Liu, V. Kumar, J. Linder, S. Pearson, and D.L. Veenstra (2017). "Cost-effectiveness of targeted therapy for moderate-to-severe plaque psoriasis: an analysis based on Institute for Clinical and Economic Review (ICER) report." ISPOR Annual Meeting, Boston, Massachusetts.
11. D. Quach, J. Babigumira, and **N. Hendrix** (2016). "Dinutuximab for high-risk neuroblastoma: A cost-utility analysis." Academy of Managed Care Pharmacy Annual Meeting, San Francisco, California.
12. **N. Hendrix**, and B. Devine (2016). "Deriving utility weights from patient-reported outcomes in epilepsy." ISPOR Annual Meeting, Washington, DC.
13. **N. Hendrix**, C. Pecinka, J. Chifaka, R. Wachepa, H. Mvula, R. Heyderman, N. French, N. Cunliffe, N. Bar-Zeev, and D. Atherly (2016). "Household costs for treatment of rotavirus-associated diarrheal disease in Malawi." Twelfth International Rotavirus Symposium, Melbourne, Australia.
14. L. Chin, P. Mathias, **N. Hendrix**, W.-J. Wang, K. Keyloun, M. Khelifi, P. Tarczy-Hornoch, and B. Devine (2016). "Leveraging a clinical data repository to characterize the landscape of pharmacogenomic biomarker-guided medication use." Academy of Managed Care Pharmacy Nexus, Baltimore, Maryland.
15. B. Devine, M. Khelifi, K. Keyloun, **N. Hendrix**, P.C. Mathias, C. Bock, and P. Tarczy-Hornoch (2015). "Characterizing the frequency of pharmacogenomic biomarker guided prescribing for drugs

with pharmacogenomic biomarker information in the FDA labeling: A pilot study using data from an electronic health record.” American Medical Informatics Association Annual Meeting, San Francisco, California.

16. **N. Hendrix**, C. Pecenka, and C. Keech (2015). “Methods for estimating the global impact of an RSV vaccine.” RSV Vaccines for the World, La Jolla, California.

GRANTS AND SPONSORED PROJECTS

Completed Grants

1. Pre-Doctoral Fellowship (Developing Data-Driven Cancer Researchers)
Role on Project: Pre-Doctoral Trainee
Funder: National Institutes of Health (National Cancer Institute)
Project Period: September 2018 – July 2020
Project Identifier: 5T32CA009168-42
2. Pre-Doctoral Fellowship in Outcomes Research
Role on Project: Pre-Doctoral Trainee
Funder: PhRMA Foundation
Project Period: July 2018 – December 2019
Total: \$37,500
Description: Funds provided for cost-of-living support during my Ph.D. dissertation.
3. Pre-Doctoral Fellowship (Health Services Research Training)
Role on Project: Pre-Doctoral Trainee
Funder: Agency for Healthcare Research and Quality
Project Period: September 2015 – August 2017
Project Identifier: 5T32HS013853-17

INVITED PRESENTATIONS

1. Cost-Effectiveness Analysis to Support the Equitable Implementation of Clinical Artificial Intelligence. Harvard University Center for Research for Computation and Society Health Equity Panel, online (due to COVID-19), April 7, 2021.
2. Cost-Effectiveness of Risk-Stratified Screening for Prostate Cancer. Cancer Intervention and Surveillance Modeling Network (CISNET) Annual Meeting, online (due to COVID-19), June 5, 2020.

TEACHING

Harvard University

Guest lecture: “Visualizing results of cost-effectiveness analyses using R and ggplot2.” Harvard University, GHP 501 (Modeling for Health System Analysis and Priority Setting). March 2021.

University of Washington

MarketScan Summer Bootcamp: Summer 2019, curriculum developer and instructor.

Pharmacy, Healthcare, and Society: Fall 2018, teaching assistant for Josh Carlson and Ryan Hansen.

HONORS & AWARDS

Rubenstein Scholarship Fund (\$5,000), University of Washington School of Pharmacy, 2020.

Rubenstein Scholarship Fund (\$4,000), University of Washington School of Pharmacy, 2019.

Graduate Student Leadership Award, University of Washington School of Pharmacy, 2019.

EDITORIAL SERVICE

Referee for *ClinicoEconomics and Outcomes Research*, *European Journal of Health Economics*, *Journal of Biomedical Informatics*, *Journal of Urology*, *Pharmacoeconomics & Drug Safety*, *PLOS One* (2), *Psoriasis: Targets and Therapy*, *Value in Health*, and *Value in Health Regional Issues* (3).

SERVICE TO PROFESSION, UNIVERSITY & DEPARTMENT

Extramural

Abstract reviewer, American Medical Informatics Association Annual Symposium (2021)

University of Washington, The Comparative Health Economics, Outcomes & Policy (CHOICE) Institute

Strategic Planning Committee, member (2019)

Incremental Thoughts: The CHOICE Institute's Student Blog, founder and lead student editor (2018-2019)

Ph.D. Admissions Committee, member (2018)

PROFESSIONAL MEMBERSHIPS

Academy of Managed Care Pharmacy, The Digital Medicine Society, International Society for Pharmacoeconomics and Outcomes Research, International Society for Pharmacoeconomics and Outcomes Research, International Society for Pharmacoeconomics and Outcomes Research

MISCELLANEOUS

Programming Languages: R, Python, VBA, SQL