

CURRICULUM VITAE

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EDUCATION AND TRAINING

Undergraduate

1998-2003	University of Suleimani, College of Medicine, Suleimani, Iraq	MD, 2003	Medicine
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Graduate

2006-2008	University of Minnesota Minneapolis, MN	MSc, 2008	Health Services Research
2008-2013	University of Minnesota Minneapolis, MN	PhD, 2013	Health Decision Sciences

Post-Graduate

2013-2015	Stanford University and Palo Alto VA Palo Alto, CA	Fellowship	Program Director: Doug Owens, MD Health Informatics
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APPOINTMENTS AND POSITIONS

Academic

2015-	Assistant Professor	Health Policy and Management, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, PA
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Non-Academic

2003-2006 Practicing physician Sulaimani University Hospitals,
Sulaimani, Iraq

MEMBERSHIP IN PROFESSIONAL AND SCIENTIFIC SOCIETIES

2010- Society for Medical Decision Making

HONORS

2019 Society for Medical Decision Making
Young Investigator Award

2006 Fulbright Scholarship

PROFESSIONAL ACTIVITIES

Teaching

Courses Taught

Years Taught	Course Number: Title	Hours of Lecture, credits Average Enrollment	Role in course Primary/Coordinator
2017-	HPM 2123: Simulation Models for Decision and Cost-Effectiveness Analyses in Healthcare	3 hours, 3 credits	Instructor

Other Teaching (lectures, tutorials and continuing education courses)

Date(s)	Type of Teaching	Title
June 2018	Short course at the Society for Medical Decision Making's European annual meeting, Leiden, Netherland	Value of Information Analysis using Gaussian approximation and metamodeling in R
June 2018	Short course at Leiden Netherlands	Decision modeling and cost-effectiveness analyses in R
February 2017	Short course at the Toronto Health Economics and Technology Assessment Collaborative	Decision modelling using R
October, 2015-2019	Short course at the Society for Medical Decision Making's annual meeting	Value of Information Analysis
October, 2014	Short course at the Society for Medical Decision Making's annual meeting	Sensitivity Analysis Using Regression Metamodeling

Major Advisor for Graduate Student Essays, Theses, and Dissertations

Name of Student	Degree Awarded, Year	Type of Document and Title	Notes
Haidong Feng	MS, 2017	Master's Thesis: Cost-effectiveness analysis of out-of-hospital cardiac arrest management strategies	

Service on Masters or Doctoral Committees

Dates Served	Name of Student	Degree Awarded	Title of Dissertation/Essay
2015-2017	Carroline Lobo	PhD, 2017	Using health care claims data to identify over-utilization of prescription opioids.
2017	Zhijie Ding	MS, 2017	Cost- effectiveness analysis of a Whole Genome Sequencing test compared to the standard care among patients with hospital-acquired bacteremia

Other Teaching and Training

Dates	Teaching Activity	Program/Description
Spring 2012	Teaching fellow	Advanced Decision Analysis (Instructor: Karen Kuntz, ScD)

Dates	Teaching Activity	Program/Description
Springs of 2010 and 2012	Teaching fellow	Cost-Effectiveness Analysis in Health Care (Instructor: John Nyman, PhD)
Spring 2012	Guest Lecturer	Quantitative Methods Applied to Problems in Healthcare (Instructor: Francois Sainfort, PhD)
Fall 2011	Guest Lecturer	Decision Analysis for Health-Care (Instructor: Karen M. Kuntz, ScD)

Research and Training

Grants and Contracts Received

Principal Investigator

Years Inclusive	Grant and/or Contract Number and Title	Source	Annual Direct Costs	% Effort
2017-2018	KL2TR0001856: The Impact of the Opioid Epidemic and the Efficacy of Its Mitigation Strategies	NIH	TBD	75%
2013-2015	R36HS02086801 Long-term Comparative Effectiveness of Rheumatoid Arthritis Treatment Strategies	AHRQ	\$40,000	50%

Co-Investigator on Grants

Years Inclusive	Grant and/or Contract Number and Title	Source	% Effort
2020-2023	R01 - Microsimulation modeling to compare the effectiveness and cost-effectiveness of nondrug interventions to manage clinical symptoms in racially/ethnically diverse persons with dementia	NIH	10%
2020-2023	R01 - Development, validation, and application of a stroke policy simulation model	NIH	10%
2016-2018	Stern Center Policy Modeling Initiative Opioid Dashboard	HPI Department of Health State of PA	10%

Years Inclusive	Grant and/or Contract Number and Title	Source	% Effort
2017	Demand Reduction Smart Tool for Analysis and Research (STAR)	NIDA	30%
2016-2017	CDC IPA Trends of the Opioid-Heroin Epidemic	IPA	15%

Invited Lectureships and Major Seminars Related to Your Research

Date	Title of Presentation	Venue
April 12, 2019	Changing Dynamics of the Drug Overdose Epidemic in the United States: 1979-2016	Senior Vice Chancellor's Research Seminar. University of Pittsburgh
March 14, 2018	Modeling the changing dynamics of the opioid epidemic in the US	McGill University, Center for Population Dynamics
Feb 3, 2017	Using metamodeling to compare chronic obstructive airway disease models	Erasmus University at Rotterdam, the Netherlands
Oct 7, 2016	Examining the Opioid Epidemic from a Public Health Perspective	The Toronto Health Economics and Technology Assessment Collaborative (THETA)
May 23, 2016	Forecasting trends in disability in a super-aging society: Adapting the future elderly model to Japan	TRENDS: Evaluating Trends in Old Age Disability. University of Michigan, Ann Arbor, MI
October 29-30, 2015	Forecasting trends in disability in a super-aging society: Adapting the future elderly model to Japan	EWC-KOSTAT Conference on "The Demographic Dividend and Population Aging in Asia and the Pacific", University of Hawaii, Honolulu, HI

PUBLICATIONS

Refereed Articles

1. **Jalal, H.**, Buchanich, J., Roberts, M. S., Balmert, L., Zhang K. & Burke, DS. Changing Dynamics of the Drug Overdose Epidemic in the United States from 1979 through 2016. (*Science*, 361, eaau1184 (2018)). DOI: 10.1126/science.aau1184. The article is covered by 45 news outlets, including The Wall Street Journal, The Guardian, National NPR, U.S. News, ABC News and NBC news. Earlier draft presented at the annual meeting of the Society for Medical Decision Meeting, Pittsburgh, PA. (Oct, 2017). [Media coverage: The Economist. “The shifting toll of America’s drug epidemic”. October 26, 2017].
2. Jutkowitz, Eric, Fernando Alarid-Escudero, Karen M. Kuntz, and **Hawre Jalal**. "The Curve of Optimal Sample Size (COSS): A Graphical Representation of the Optimal Sample Size from a Value of Information Analysis." *PharmacoEconomics* 37, no. 7 (2019): 871-877.
3. Alarid-Escudero, Fernando, Eva A. Enns, Karen M. Kuntz, Tzeyu L. Michaud, and **Hawre Jalal**. “Time Traveling Is Just Too Dangerous” but Some Methods Are Worth Revisiting: The Advantages of Expected Loss Curves Over Cost-Effectiveness Acceptability Curves and Frontier." *Value in Health* 22, no. 5 (2019): 611-618.
4. Jutkowitz, Eric, Fernando Alarid-Escudero, Karen M. Kuntz, and **Hawre Jalal**. "The Curve of Optimal Sample Size (COSS): A Graphical Representation of the Optimal Sample Size from a Value of Information Analysis." *PharmacoEconomics* 37, no. 7 (2019): 871-877.
5. Calculating the Expected Value of Sample Information in Practice: Considerations from Three Case Studies. Anna Heath, Natalia R. Kunst, Christopher Jackson, Mark Strong, Fernando Alarid-Escudero, Jeremy D. Goldhaber-Fiebert, Gianluca Baio, Nicolas A. Menzies, **Hawre Jalal**, and on behalf of the Collaborative Network for Value of Information (ConVOI). (Submitted April, 2019)
6. A Multidimensional Array Representation of State-Transition Model Dynamics. Eline M. Krijkamp, Fernando Alarid-Escudero, Eva A. Enns, Petros Pechlivanoglou, M.G. Myriam Hunink, Hawre J. Jalal. (Submitted June 2019).
7. Sinclair, D. R., Roberts, M. S., Burke, D.S & **Jalal, H.** A dynamic transmission disease model of the opioid epidemic. Under Review BMC Public Health (2018). An earlier draft was covered by The Economist. “Forecasting the opioid epidemic: When will it peak? And how many will it kill?” October 26, 2017.
8. Dewitt, B., **Jalal, H.**, Hanmer, J. Computing PROPr utility scores for PROMIS® Profile instruments. *Value in Health*. (submitted Jan 10, 2019).
9. Soeteman, D.; Resch, S.; **Jalal, H.**; Dugdale, C.; Penazzato, M.; Weinstein, M; Phillips, A; Hou, T; Abrams, E; Dunning, L; Newell, M; Pei, P; Freedberg, K; Walensky, R; Ciaranello, A. Developing and validating a metamodel of a microsimulation model of infant hiv testing and screening strategies. *Medical Decision Making* (Submitted Feb. 21, 2019)
10. Sinclair, D. R., Roberts, M. S., Burke, D.S & **Jalal, H.** A dynamic transmission disease model of the opioid epidemic. Under Review BMC Public Health (2018).

An earlier draft was presented at the annual meeting of the Society for Medical Decision Making, Pittsburgh, PA (Oct, 2017). [Media coverage: The Economist. "Forecasting the opioid epidemic: When will it peak? And how many will it kill?" October 26, 2017].

11. Dewitt, B., Jalal, H, Hanmer, J. Computing PROPr utility scores for PROMIS® Profile instruments. *Value in Health*. (submitted Jan 10, 2019).
12. Soeteman, D.; Resch, S.; Jalal, H.; Dugdale, C.; Penazzato, M.; Weinstein, M; Phillips, A; Hou, T; Abrams, E; Dunning, L; Newell, M; Pei, P; Freedberg, K; Walensky, R; Ciaranello, A. Developing and validating a metamodel of a microsimulation model of infant hiv testing and screening strategies. *Medical Decision Making* (Submitted Feb. 21, 2019)
13. Krijkamp, E. M., Alarid-Escudero, F., Enns, E. A., **Jalal, H.**, Hunink, M. M., & Pechlivanoglou, P. (2018). Microsimulation Modeling for Health Decision Sciences Using R: A Tutorial. *Medical Decision Making*, 38(3), 400-422.
14. **Jalal, H.**, & Alarid-Escudero, F. (2018). A Gaussian approximation approach for value of information analysis. *Medical Decision Making*, 38(2), 174-188.
15. Jutkowitz E, Alarid-Escudero F, Choi H, Kuntz K, **Jalal H.** Value of information analyses of gout therapies: Using a meta-modeling approach. *PharmacoEconomics*. In Press (2017).
16. **Jalal, H.**, Pechlivanoglou, P., Krijkamp, E., Alarid-Escudero, F., Enns, E., & Hunink, M. M. (2017). An overview of R in health decision sciences. *Medical Decision Making*, 37(7), 735-746.
17. Chen, B. K., **Jalal, H.**, Hashimoto, H., Suen, S. C., Eggleston, K., Hurley, M., ... & Bhattacharya, J. (2016). Forecasting trends in disability in a super-aging society: Adapting the Future Elderly Model to Japan. *The Journal of the Economics of Ageing*, 8, 42-51, and the *National Bureau of Economic Research* (No. w21870).
18. **Jalal, H.**, O'Dell, J. R., Bridges, S. L., Cofield, S., Curtis, J. R., Mikuls, T. R., Moreland, L. W., Michaud, K. Cost-Effectiveness of Triple Therapy versus Etanercept Plus Methotrexate in Early Aggressive Rheumatoid Arthritis. *Arthritis care & research*. 2016.
19. Michaud, T. L., Abraham, J., **Jalal, H.**, Luepker, R. V., Duval, S., & Hirsch, A. T.. Cost-effectiveness of a statewide campaign to promote aspirin use for primary prevention of cardiovascular disease. *Journal of the American Heart Association*. 2015. 4(12), e002321.
20. Goldhaber-Fiebert, J. D., **Jalal, H.** (2016). Some health states are better than others: using health state rank order to improve probabilistic analyses. *Medical Decision Making*, 36(8), 927-940.
21. **Jalal H**, Goldhaber-Fiebert J, Kuntz KM. Computing Expected Value of Partial Sample Information from Probabilistic Sensitivity Analysis Using Linear Regression Metamodeling. *Medical Decision Making*. 2015. 35(5):584-595.
22. Leung, T. I., **Jalal, H.**, Zulman, D. M., Dumontier, M., Owens, D. K., Musen, M. A., & Goldstein, M. K. Automating identification of multiple chronic conditions in clinical practice guidelines. *AMIA Summits on Translational Science Proceedings*, 2015, 456.

23. **Jalal H**, Dowd B, Sainfort F, Kuntz KM. Linear regression metamodeling as a tool to summarize and present simulation model results. *Medical Decision Making* 2013;33 (7):880-890.
24. Wang SY, Chu H, Shamliyan T, **Jalal H**, Kuntz KM, Kane R, Virnig B. Network meta-analysis of margin threshold for women with ductal carcinoma in situ. *Journal of National Cancer Institute*. 2012;104 (7):507–516.
25. Nyman J, **Jalal H**. Including indirect medical care costs from survivor years of life in economic evaluations. *Pharmacoeconomics*. 2011;29 (3):173-174.

Published Abstracts

1. Jalal, H., Curtis, J. R., Cofield, S., Moreland, L. W., O'Dell, J. R., & Michaud, K. Cost-Effectiveness Analysis Of Triple Therapy Versus Etanercept Plus Methotrexate In Early Aggressive Rheumatoid Arthritis: Analysis Based On The TEAR Trial.. *Arthritis and rheumatism*. October, 2013. Vol. 65: S1127-S1127
2. Pedro, S., Wolfe, F., Jalal, H., & Michaud, K. Discontinuation Rates In Patients With RA Of Triple Disease Modifying Antirheumatic Therapy. *Arthritis and rheumatism*. October 2013. Vol. 65: S450-S450.
3. Jalal, H., Michaud, K., Choi, H. K., Rho, Y. H., & Kuntz, K. Are Biologics Cost-Effective? Analysis Based on Real-Life Rheumatoid Arthritis Patients. *Arthritis and rheumatism*. October 2013. Vol. 63 (10):S1011-S1011.

Presentations

1. Jalal H., Changing Dynamics of Drug Overdose Deaths in the United States, 1979-2016. Senior Vice Chancellor's Research Seminar, University of Pittsburgh, April, 2019.
2. Jalal H., Changing Dynamics of Drug Overdose Deaths in the United States, 1979-2016. Invited presentation at the Health Services Research Seminar Series, University of Pittsburgh, March, 2019.
3. Jalal H, Chen B, Hashimoto H, Suen S, Eggleston K, Schoemaker L, Bhattacharya J. Trends in Disability in a Super-Aging Society: Adapting the Future Elderly Model to Japan. The Demographic Dividend and Population Aging in Asia. East-West Center, Honolulu, Hawaii, USA. 29-30, October, 2015
4. Jalal H, Alarid-Escudero F. An efficient hybrid calibration approach combining artificial neural network metamodeling and Bayesian methods. The 37th Annual Meeting of the Society for Medical Decision Making, St. Louis, MO, October, 2015.
5. Jutkowitz E, Alarid-Escudero F, Choi H, Kuntz K, Jalal H. Value of information analyses of gout therapies: Using a meta-modeling approach. The 37th Annual Meeting of the Society for Medical Decision Making, St. Louis, MO, October, 2015.
6. Alarid-Escudero F, Jutkowitz E, Kuntz K, Jalal H. Introducing the curve of optimal sample size (coss): a graphic representation of optimal sample size by willingness-to-pay threshold. The 37th Annual Meeting of the Society for Medical Decision Making, St. Louis, MO, October, 2015. Won the Lusted Student Award.
7. McDonald K, Skinner H, Zrelak P, Utter G, Davies S, Jalal H, Houchens R, Romano P. Development of new harm-based weighting approach to composite indicators: The Agency for Healthcare Research and Quality Patient Safety for selected Indicators

(AHRQ PSI-90). The 37th Annual Meeting of the Society for Medical Decision Making, St. Louis, MO, October, 2015.

8. Jalal H, Goldhaber-Fiebert. Some health states are certainly better than others: using health state rank order to improve probabilistic sensitivity analyses. The 36th Annual Meeting of the Society for Medical Decision Making, Miami, FL 2014.
9. Leung, T.I., Jalal, H, Zulman, D.M., Owens, D.K., Goldstein, M.K. (2014, October) Automating Identification of Multiple Chronic Conditions in Clinical Practice Guideline Recommendations. The 36th Annual Meeting of the Society for Medical Decision Making, Miami, FL 2014.
10. Leung, T.I., Jalal, H, Zulman, D.M., Owens, D.K., Musen, M.A., Dumontier, M., Goldstein, M.K. (2014, November) Automating Identification of Multiple Chronic Conditions in Clinical Practice Guideline Recommendations. American Medical Informatics Association 2014 Annual Symposium, Washington, DC.
11. Jalal H, Kuntz KM. Expected value of sample information for correlated data: a practical approach. Podium presentation at the Society for Medical Decision Making Annual Meeting, Baltimore, Maryland, October 2013. Lee B. Lusted Student Award Finalist.
12. Jalal H, Boudreaux M, Kuntz KM. Measuring decision sensitivity with multinomial logistic regression metamodeling. Podium presentation at the Society for Medical Decision Making Annual Meeting, Baltimore, Maryland, October 2013. Lee B. Lusted Student Award Finalist.
13. Jalal H, Goldhaber-Fiebert JD, Kuntz KM. Examining the effect of correlated parameters on regression metamodeling. Poster presentation at the Society for Medical Decision Making Annual Meeting, Baltimore, Maryland, October 2013.
14. Jalal H, Kuntz KM. Building correlations among model parameters: a practical approach. Poster presentation at the Society for Medical Decision Making Annual Meeting, Baltimore, Maryland, October 2013.
15. Lin T, Jalal H, Abraham J, Hirsch A, Duval S, Miller K, Luepker R. The cost-effectiveness of a media campaign to increase aspirin use for primary prevention of cardiovascular events. Poster presentation at the Society for Medical Decision Making Annual Meeting, Baltimore, Maryland, October 2013.
16. Jalal H, Kuntz KM. Simulating Flexiscope and SCORE trial results with SimCRC Lite. Presented at the annual Cancer Intervention and Surveillance Modeling Network colorectal cancer meeting. National Institutes of Health, Bethesda, MD, November 2012.
17. Jalal H, Dowd B, Sainfort F, Kuntz KM. Linear regression metamodeling as a tool to summarize and present simulation model outputs. Poster presentation at the Society for Medical Decision Making Annual Meeting, Phoenix, Arizona, October 2012.
18. Jalal H, Michaud K, Wolfe F, Kuntz KM. Implications of using effectiveness instead of efficacy on the cost-effectiveness of biologics in rheumatoid arthritis: a multi-study sensitivity analysis. Poster presentation at the Society for Medical Decision Making Annual Meeting, Phoenix, Arizona, October 2012
19. Jalal H, Michaud K, Sainfort F, Schousboe J, Nyman J, Kuntz KM. When and for whom are biologics cost-effective in rheumatoid arthritis? Poster presentation at the

- Society for Medical Decision Making Annual Meeting, Phoenix, Arizona, October 2012
20. Sainfort F, Jalal H. Sensitivity analysis methods for decision models: a review and two novel techniques. Poster presentation at the Society for Medical Decision Making Annual Meeting, Phoenix, Arizona, October 2012
 21. Jalal H, Dowd B, Kuntz KM. A linear approximation of decision and cost-effectiveness analysis models. Podium presentation at the Annual Research Meeting of AcademyHealth and a Podium presentation at the National Research Service Award (NRSA); Orlando, Florida, June 2012
 22. Jalal H, Michaud K, Wolfe F, Kuntz KM. Efficacy versus effectiveness of biologics in rheumatoid arthritis: implications on cost-effectiveness analysis. Podium presentation at the Annual Research Meeting of AcademyHealth and poster presentation at the National Research Service Award (NRSA), Orlando, Florida, June 2012.
 23. Wang S, Shamliyan T, Jalal H, Virnig B, Kane R, Kuntz KM. How much negative margin is enough for patients with ductal carcinoma in situ receiving breast conserving surgery with or without radiotherapy? A Bayesian meta-analysis. Poster presentation at the Society of Medical Decision Making Annual Meeting, Toronto, Canada, October 2011

SERVICE

1. Service to School and University

Years	Committee	Position
2016-	Planning and Budget Policies Committee	Member
2012	Faculty search committee, Department of Health Policy and Management, University of Minnesota, Minneapolis, MN	Elected student representative

2. Service to Field of Scholarship

a. Manuscript and Other Document/Publication Review

Dates	Journal Title
2017	PCORI: A Structured Approach to Prioritizing Cancer Research using Stakeholders and Value of Information Patient-Centered Outcomes Research Institute
2013 -	Medical Decision Making
2018	Expert Review of Pharmacoeconomics & Outcomes Research

b. Leadership in Scholarly and Professional Organizations and Honorary Societies

Date	Position	Organization
2017 and 2018	Short Course Review Committee Co-chair	The Society for Medical Decision Making
2016 and 2018	Student award Judge	The Society for Medical Decision Making