

# Danny R. Hughes

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## EDUCATION

### **Ph.D. in Economics**, May 2005

University of Georgia, Athens, Georgia

Research Interests: Health Economics, Healthcare Operations Management, and Applied Econometrics

### **B.S. in Economics with Honor**, June 1998

Georgia Institute of Technology, Atlanta, Georgia

Certificate in Land Development, Georgia Institute of Technology City Planning Program

## PROFESSIONAL EXPERIENCE

**Professor**, College of Health Solutions, Arizona State University (01/2023 – Present)

**Adjunct Professor**, School of Economics, Georgia Institute of Technology (01/2023 – Present)

**Professor**, School of Economics, Georgia Institute of Technology (08/2018 – 12/2022)

Director, Health Economics and Analytics Lab (08/2018 – 12/2022)

Director of Masters Program (08/2019 – 08/2020)

**Affiliate Senior Research Fellow**, Harvey L. Neiman Health Policy Institute, Reston, Virginia (08/2020 – 12/2022)

**Executive Director and Senior Research Fellow**, Harvey L. Neiman Health Policy Institute, Reston, Virginia (08/2018 – 07/2020)

**Adjunct Professor**, Department of Radiology and Imaging Sciences, Emory University (01/2018 – 12/2022)

**Visiting Professor**, School of Economics, Georgia Institute of Technology (08/2017 – 07/2018)

**Senior Director, Health Policy Research and Senior Research Fellow**, Harvey L. Neiman Health Policy Institute, Reston, Virginia (08/2012 – 07/2018)

**Affiliate Faculty**, Department of Health Administration and Policy, George Mason University (01/2013 – 07/2017)

**Assistant Professor**, Department of Health Administration and Policy, University of Oklahoma Health Sciences Center (01/2011 – 08/2012)

**Assistant Director, Health Policy Research**, American College of Radiology, Reston, Virginia (09/2008 – 01/2011)

**Assistant Professor**, Department of Economics and Finance, University of South Alabama (08/2004 – 08/2008)

**Research Fellow**, Logistics Management Institute, McLean, Virginia (03/2003 – 07/2005)

**Research Associate**, Center for Economic Development Research, University of South Florida (03/2002 – 03/2003)

**Research Assistant**, Carl Vinson Institute of Government, University of Georgia (Spring 2001)

**Graduate Instructor**, Department of Economics, University of Georgia (05/1999 – 12/2002)

**Analyst, Technology Acquisitions**, Tecolote Research, Bedford, Massachusetts (10/1998 – 10/2000)

**Corporal – Nuclear, Biological, and Chemical Operations Specialist**, U.S. Army, Fort Carson, Colorado (08/1992 – 07/1995)

## REFEREED PUBLICATIONS

**(Indicates publications with \*students and \*\*post-docs):**

## **I. HEALTH POLICY AND HEALTH SERVICES RESEARCH**

- [1] K. Jayaraman, \*S. Santavicca, **D.R. Hughes**, J.A. Hirsch, R. Duszak, A.R. Chatterjee. “Recent Trends in High-Volume Medicare Stroke Thrombectomy Provider Characteristics,” *Journal of NeuroInterventional Surgery*, forthcoming
- [2] **D.R. Hughes**, \*C. Filar, D.T. Mitchell. 2022. “Nurse Practitioner Scope of Practice and the Prevention of Foot Complications in Rural Diabetes Patients,” *Journal of Rural Health*, 38(4): 994-998
- [3] S. Sprigle, \*\*J. Chen, **D.R. Hughes**. 2022. “Assessment of wheeled mobility devices provided to a commercially insured population in 2017,” *Assistive Technology*, 34(3): 308-315
- [4] \*\*N. Abashidze, C. Stecher, A. Rosenkrantz, R. Duszak, **D.R. Hughes**. 2021. “Racial/Ethnic Disparities in the Use of Prostate MRI Following an Elevated Prostate-Specific Antigen Test,” *JAMA Network Open*, 4(11): e2132388
- [5] \*A. ElHabr, J. Katz, J.J. Wang, M. Bastani, G. Martinez, M. Gribko, **D.R. Hughes**, P. Sanelli. 2021. “Predicting 90-Day Modified Rankin Scale Score with Discharge Information in Acute Ischemic Stroke Patients Following Treatment,” *BMJ Neurology Open*, 3:e000177: 1-9
- [6] G. Sadigh, N. Lava, J. Switchenko, R. Duszak, E. Krupinski, C. Meltzer, **D.R. Hughes**, R. Carlos. 2021. “Patient-reported Financial Toxicity in Multiple Sclerosis: Predictors and Association with Care Non-Adherence,” *Multiple Sclerosis Journal*, 27(3): 453-464
- [7] X. Wu, M. Khunte, D. Gandi, C. Matouk, **D.R. Hughes**, P. Sanelli, A. Malhotra. 2020. “Implications of Achieving TIC1 2b vs TIC1 3 Reperfusion in Patients with Ischemic Stroke: A Cost-Effectiveness Analysis,” *Journal of NeuroInterventional Surgery*, 12(12): 1161-1165
- [8] H. Yeung, M.L. Baranowski, R.A. Swerlick, S.C. Chen, J. Hemingway, **D.R. Hughes**, R. Duszak. 2018. “Utilization and Cost of Actinic Keratosis Destruction in the Medicare Part B Fee-For-Service Population in 2007-2015,” *JAMA Dermatology*, 154(11): 1281-1285
- [9] M. Jiang, **D.R. Hughes**, W. Wang. 2018. “The Effect of Medicare’s Annual Wellness Visit on Preventive Care for the Elderly,” *Preventive Medicine*, 116: 126-133
- [10] A. Rosenkrantz, J. Hemingway, **D.R. Hughes**, R. Duszak, B. Allen, J. Weinreb. 2018. “Evolving Utilization of Pre-Biopsy Prostate MRI in the Medicare Population,” *Journal of Urology*, 200(1): 89-94
- [11] A. Prabhakar, R.V. Gottumukkala, J. Hemingway, **D.R. Hughes**, S. Patel, R. Duszak. 2018. “Increasing Utilization of Emergency Department Neuroimaging in Medicare Beneficiaries from 1994 to 2015,” *American Journal of Emergency Medicine*, 36(4):680-683
- [12] D. Deyo, A. Khaliq, D. Mitchell, **D.R. Hughes**. 2018. “Electronic Sharing of Diagnostic Information and Patient Outcomes,” *American Journal of Managed Care*, 24(1): 294-299
- [13] J. Langston, R. Duszak, V. Orcutt, H. Schultz, B. Hornherger, L. Jenkins, J. Hemingway, **D.R. Hughes**, R. Pruthi, M. Nielsen. 2017. “The Expanding Role of Advanced Practice Providers in Urologic Procedural Care,” *Urology*, 106:70-75
- [14] W. Beckworth, M. Jiang, J. Hemingway, **D.R. Hughes**, D. Staggs. 2016. “Facet Injection Trends in the Medicare Population and the Impact of Bundling Codes,” *The Spine Journal*, 16(9):1037-1041

- [15] M. Jiang, **D.R. Hughes**, R. Duszak. 2015. "Screening Mammography Rates in the Medicare Population before and after the 2009 US Preventive Services Task Force Guideline Change: An Interrupted Time Series Analysis," *Women's Health Issues*, 25(3): 239-245 (**Selected as Editor's Choice paper; Winner of Charles E. Gibbs Leadership Prize for best paper in 2015**)
- [16] M. Jiang, **D.R. Hughes**, C. Appleton, G. McGinty, R. Duszak. 2015. "Recent Trends in Adherence to Continuous Screening for Breast Cancer among Medicare Beneficiaries," *Preventive Medicine*, 73: 47-52
- [17] **D.R. Hughes**, M. Jiang, R. Duszak. 2015. "A Comparison of Diagnostic Imaging Ordering Patterns between Advanced Practice Clinicians and Primary Care Physicians following Office-based Evaluation and Management Visits," *JAMA Internal Medicine*, 175(1): 101-107
- [18] **D.R. Hughes**, A. Khaliq. 2014. "The Effect of Macroeconomic Conditions on the Care Decisions of the Employed," *Medical Care*, 52(2): 121-127
- [19] A. Rosenkrantz, N. Bilal, **D.R. Hughes**, R. Duszak. 2014. "National Specialty Trends in Billable Diagnostic Ultrasound in the Emergency Department Setting: Analysis of Medicare Claims Data," *American Journal of Emergency Medicine*, 32(12): 1470-1475
- [20] A. Khaliq, A. Mwachofi, **D.R. Hughes**, R. Broyles, D. Wheeler, R. Roswell, 2013. "The Current State of Electronic Health Record (EHR) Use in Oklahoma," *Journal of the Oklahoma State Medical Association*, 106(2): 53-56
- [21] **D.R. Hughes**, J. Sunshine, M. Bhargavan, H. Forman, 2011. "Physician Self-Referral for Imaging and the Cost of Chronic Care for Medicare Beneficiaries" *Medical Care*, 49(9): 857-864
- [22] **D.R. Hughes**, M. Bhargavan, J. Sunshine, 2010. "Imaging Self-Referral Associated With Higher Costs, Limited Impact On Illness Duration" *Health Affairs*, 29(12): 2244-2251
- [23] J. Sunshine, **D.R. Hughes**, C. Meghea, M. Bhargavan, 2010. "What Factors Affect the Productivity and Efficiency of Physician Practices?" *Medical Care*, 48(2): 110-117

## II. ECONOMICS AND MANAGEMENT SCIENCE

- [24] C. Wernz, Y. Song, **D.R. Hughes**. 2021. "How Hospitals Can Improve Their Quality Metrics: A Decision-Theoretic Model," *Health Care Management Science*, 24(4): 702-715
- [25] H. Zhang, C. Wernz, **D.R. Hughes**. 2018. "A Stochastic Game Analysis of Incentives and Behavioral Barriers in Chronic Disease Management," *Service Science*, 10(3): 302-319
- [26] H. Zhang, C. Wernz, **D.R. Hughes**. 2018. "Modeling and Designing Health Care Payment Innovations for Medical Imaging," *Health Care Management Science*, 21(1): 37-51
- [27] D. T. Mitchell, **D.R. Hughes**, N. Campbell. 2014. "Are Powerful Majorities Inefficient for Parties and Efficient for Taxpayers? An Analysis of Budget Maximization in the U.S.," *Public Finance Review*, 42(1): 117-138
- [28] \*J. Eckhause, S.A. Gabriel, **D.R. Hughes**, 2012. "An Integer Programming Approach for Evaluating R&D Funding Decisions with Optimal Budget Allocations," *IEEE Transactions on Engineering Management*, 59(4): 679-691
- [29] **D.R. Hughes**, D.T. Mitchell, \*D. Molinari, 2011. "Heeding the Call: Seminary Enrollment and the Business Cycle," *Applied Economic Letters*, 18(5): 433-437

- [30] \*J. Eckhause, **D.R. Hughes**, S.A. Gabriel, 2009. "Evaluating Real Options for Mitigating Technical Risk in Public Sector R&D Acquisitions," *International Journal of Project Management*, 27(4):365-377
- [31] **D.R. Hughes**, Y.W. Whitaker, D. Lee, \*J. Eckhause, 2008. "Advantages, Disadvantages, and Uses of Generalized Activity Networks for Schedule Estimation," *Military Operations Research*, 13(3):27-40
- [32] M.H. Bonds, **D.R. Hughes**, 2007. "On the Productivity of Public Forest: A Stochastic Frontier Analysis of Mississippi School Trust Timber Production," *Canadian Journal of Agricultural Economics*, 55(2):171-183

### III. RADIOLOGY JOURNALS

- [33] **D.R. Hughes**, \*\*J. Chen, \*A. Wallace, \*S. Rajendra, \*S. Santavicca, R. Duszak, E.Y. Rula, R. Smith. "Comparison of Lung Cancer Screening Eligibility and Use between Commercial, Medicare, and Medicare Advantage Enrollees," *Journal of the American College of Radiology*, forthcoming
- [34] N. Salastekar, R. Duszak, \*S. Santavicca, M. Horny, P. Balthazar, A. Khaja, **D.R. Hughes**, T.N. Hanna. "Utilization of Chest and Abdominopelvic CT for Traumatic Injury from 2011 to 2018: Evaluation Using a National Commercial Database," *American Journal of Roentgenology*, forthcoming
- [35] \*S. Santavicca, **D.R. Hughes**, A.B. Rosenkrantz, E. Rubin, R. Duszak R. "Professional Services Rendered by Nurse Practitioners and Physician Assistants in Radiology Practices," *Journal of the American College of Radiology*, forthcoming
- [36] R.J. Allen, J. Hirsch, J. Hemingway, **D.R. Hughes**, R. Lerebours, S. Luo, B.C. Allen, R. Duszak, D. Rosman. 2023. "Association and Trends in Medicare Denials and Utilization for Brain CT: Indirect Impacts by Targeted Policy Intervention?" *Current Problems in Diagnostic Radiology*, 52(1): 31-34
- [37] J.M. Liao, **D.R. Hughes**, S. Shetty, C.I. Lee. 2022. "JACR Health Policy Expert Panel: Bundled Payments," *Journal of the American College of Radiology*, 19(12): 1350-1352
- [38] \*S. Santavicca, M. Willis, E. Friedberg, **D.R. Hughes**, R. Duszak, 2022. "Osteopathic vs. Allopathic Radiologist Workforce Characteristics: A Medicare Administrative and Claims Data Analysis," *Journal of the American College of Radiology*, 19(9): 997-1005
- [39] R. Duszak, J. Hemingway, E.W. Christensen, A.M. Saindane, **D.R. Hughes**, E.Y. Rula. 2022. "An Empiric Medicare Claims-Based Utilization Approach to Mitigating the Iodinated Contrast Shortage," *Journal of the American College of Radiology*, 19(7): 846-848
- [40] K. Tharp, \*S. Santavicca, **D.R. Hughes**, D. Kishore, J.D. Banja, R. Duszak. 2022. "Characteristics of Radiologists Serving as Medical Malpractice Expert Witnesses for Defense vs. Plaintiff," *Journal of the American College of Radiology*, 19(7): 807-813
- [41] \*S. Santavicca, **D.R. Hughes**, A. Rosenkrantz, E. Rubin, R. Duszak. 2022. "Radiology Practices Employing Nurse Practitioners and Physician Assistants: Characteristics and Trends from 2017 through 2019," *Journal of the American College of Radiology*, 19(6): 746-753
- [42] J. Allen, R. Peterson, **D.R. Hughes**, J. Hemingway, E. Rula, E. Rubin, R. Duszak. 2022. "Evolving Radiology Trainee Neuroimaging Workloads: A National Medicare Claims-based Analysis," *Academic Radiology*, 29(Supplement 3): S215-221
- [43] \*A. El Habr, \*\*S. Merdan, T. Ayer, A. Prater, T. Hanna, M. Horný, R. Duszak, **D.R. Hughes**. 2022. "Increasing Utilization of Emergency Department Neuroimaging from 2007 to 2017," *American Journal of Roentgenology*, 218(1): 165-173

- [44] \*S. Santavicca, R. Duszak, G. Nicola, A. Rosenkrantz, C. Wernz, **D.R. Hughes**. 2021. "Evolving Radiologist Participation in Medicare Shared Savings Program Accountable Care Organizations," *Journal of the American College of Radiology*, 18(9): 1332-1341
- [45] C. Lee, L. Moy, **D.R. Hughes**, D. Golden, M. Bhargavan, J. Hemingway, A. Geras, R. Duszak, A.B. Rosenkrantz. 2021. "Radiologist Characteristics Associated with Interpretive Performance of Screening Mammography: A National Mammography Database (NMD) Study," *Radiology*, 300(3): 518-528
- [46] M. Wintermark, A. Rosenkrantz, P. Rezaei, N. Fredericks, \*L. Chaves, J. Burleson, G. R. Haines, M. Chatfield, W. Thorwarth, R. Duszak, **D.R. Hughes**. 2021. "Predicted Cost Savings Achieved by the Radiology Support, Communication and Alignment Network from Reducing Medical Imaging Overutilization in the Medicare Population," *Journal of the American College of Radiology*, 18(5): 704-712
- [47] D. Johnson, M. Waid, E. Rula, **D.R. Hughes**, A. Rosenkrantz, R. Duszak. 2021. "Comparison of Radiologists and Other Specialists in the Performance of Lumbar Puncture Procedures Over Time," *American Journal of Neuroradiology*, 42(6): 1174-1181
- [48] C.M. Hawkins, R. Duszak, **D.R. Hughes**, R. Liu, A.S. Resnick, D.A. Kooby, J.C. Durack, J.A. Kaufman, F. Dubeck, M.B. Canada, K.L. Krol, S.B. White. 2021. "Defining the Value of Interventional Radiology to Healthcare Stakeholders: Proceedings from a Society of Interventional Radiology Research Consensus Panel," *Journal of Vascular and Interventional Radiology*, 32(7): 1088.e1-1088.e8
- [49] A. Degnan, J. Hemingway, H. Otero, **D.R. Hughes**. 2021. "Developmental hip dysplasia and hip ultrasound frequency in a large American payer database," *Clinical Imaging*, 76: 213-216
- [50] J.J. Naidich, A. Boltyenkov, J. Wang, J. Chusid, E. Rula, **D.R. Hughes**, P. Sanelli. 2021. "Imaging Utilization During the COVID-19 Pandemic Highlights Socioeconomic Health Disparities," *Journal of the American College of Radiology*, 18(4): 554-565
- [51] \*S. Santavicca, **D.R. Hughes**, H. Fleishon, F. Lexa, E. Rubin, A. Rosenkrantz, R. Duszak. 2021. "Radiologist Practice Separation: Recent Trends and Characteristics," *Journal of the American College of Radiology*, 18(4): 580-589
- [52] R. French, D. Rosman, T. Taylor, J. Hemingway, **D.R. Hughes**, R. Duszak, A. Rosenkrantz. 2021. "Changes in Current Procedural Terminology Coding and its Effect on Specialty-Level Utilization of Musculoskeletal Ultrasound," *Current Problems in Diagnostic Radiology*, 50(3): 337-343
- [53] P. Guichet, R. Duszak, \*L. Chaves, **D.R. Hughes**, N. Hindman, A. Rosenkrantz. 2021. "Changing National Medicare Utilization of Catheter, CT, and MR Extremity Angiography: A Specialty-Focused 16-Year Analysis," *Current Problems in Diagnostic Radiology*, 50(3): 308-314
- [54] T. Hanna, E. Friedberg, I.M. Dequesada, \*L. Chaves, R. Pyatt, R. Duszak, **D.R. Hughes**, 2021. "Disparities in the Use of Emergency Department Advanced Imaging in Medicare Beneficiaries," *American Journal of Roentgenology*, 216(2):519-525
- [55] A. Villalobos, M. Horny, **D.R. Hughes**, R. Duszak, 2021. "Associations over Time Between Paid Medical Malpractice Claims and Imaging Utilization in the United States," *Journal of the American College of Radiology*, 18(1): 34-41
- [56] A. Malhotra, X. Wu, H. Fleishon, R. Duszak, E. Silva, G. McGinty, C. Bender, B. Williams, N. Pashley, C. Stengel, J. Naidich, **D.R. Hughes**, P. Sanelli. 2020. "Initial Impact of Coronavirus Disease 2019 (COVID-19) on Radiology Practices: An ACR/RBMA Survey," *Journal of the American College of Radiology*, 17(11): 1525-1531

- [57] S. Asnafi, R. Duszak, J. Hemingway, **D.R. Hughes**, J.W. Allen. 2020. "Evolving Use of fMRI in Medicare Beneficiaries," *American Journal of Neuroradiology*, 41(11): 1996-2000
- [58] R. Duszak, J. Maze, \*C. Sessa, H.B. Fleishon, L. Golding, G. Nicola, **D.R. Hughes**. 2020. "Characteristics of Coronavirus Disease 2019 (COVID-19) Community Practice Declines in Non-Invasive Diagnostic Imaging Professional Work," *Journal of the American College of Radiology*, 17(11): 1453-1459
- [59] J.J. Naidich, A. Boltyenkov, J. Wang, J. Chusid, **D.R. Hughes**, P. Sanelli. 2020. "Coronavirus Disease 2019 (COVID-19) Pandemic Shifts Inpatient Imaging Utilization," *Journal of the American College of Radiology*, 17(10): 1289-1298
- [60] J. Cronan, M. Horny R. Duszak, J. Newsome, R. Carlos, **D.R. Hughes**, N. Kokabi. 2020. "Invasive Procedural Treatments for Symptomatic Uterine Fibroids: A Cost Analysis," *Journal of the American College of Radiology*, 17(10): 1237-1244
- [61] A. Rosenkrantz, \*L. Chaves, **D.R. Hughes**, M. Recht, S. Nass, H. Hricak. 2020. "National Trends in Oncology Imaging," *Journal of the American College of Radiology*, 17(9): 1116-1122
- [62] J. Eberth, J. Ersek, L. Terry, S. Bills, N. Chintanippu, R. Carlos, **D.R. Hughes**, J. Studts. 2020. "Leveraging the Mammography Setting to Raise Awareness and Facilitate Referral to Lung Cancer Screening: A Qualitative Analysis," *Journal of the American College of Radiology*, 17(7): 960-969
- [63] J.J. Naidich, A. Boltyenkov, J. Wang, J. Chusid, **D.R. Hughes**, P. Sanelli. 2020. "Impact of the Coronavirus Disease 2019 (COVID-19) Pandemic on Imaging Case Volumes," *Journal of the American College of Radiology*, 17(7): 865-872
- [64] X. Wu, **D.R. Hughes**, D. Gandhi, C. Matouk, K. Sheth, J. Schindler, C. Wira, M. Wintermark, P. Sanelli, A. Malhotra. 2020. "Computed Tomography Angiography for Triage of Acute, Minor Stroke Patients: A Cost-Effectiveness Analysis," *Radiology*, 294(3): 580-588
- [65] A. Rosenkrantz, **D.R. Hughes**, R. Duszak. 2020. "Increasing Subspecialization of the National Radiologist Workforce," *Journal of the American College of Radiology*, 17(6): 812-818
- [66] M. Chen, A. Rosenkrantz, R. Lee, J. Hirsch, **D.R. Hughes**, G. Nicola. 2020. "Determining the Patient Complexity of Head CT Examinations: Implications for Proper Valuation of a Critical Imaging Service," *Current Problems in Diagnostic Radiology*, 49(3): 177-181
- [67] V. Makeeva, C.M. Hawkins, A.B. Rosenkrantz, **D.R. Hughes**, \*L. Chaves, R. Duszak. 2019. "Diagnostic Imaging Examinations Interpreted by Nurse Practitioners and Physician Assistants: A National and State Level Medicare Claims Analysis," *American Journal of Roentgenology*, 213(5): 992-997
- [68] P. Balthazar, G. Sadigh, **D.R. Hughes**, A. Rosenkrantz, T. Hanna, R. Duszak. 2019. "Increasing Use, Geographic Variation, and Disparities in Emergency Department Computed Tomography for Suspected Urolithiasis," *Journal of the American College of Radiology*, 16(11): 1547-1553
- [69] R. Gottumukkala, A. Prabhakar, J. Hemingway, **D.R. Hughes**, R. Duszak. 2019. "Disparities over Time in Volume, Day of Week, and Patient Complexity for Paracentesis and Thoracentesis Procedures Performed by Radiologists Versus Non-radiologists," *Journal of Vascular and Interventional Radiology*, 30(11): 1769-1778
- [70] M. Chiarello, R. Duszak, J. Hemingway, **D.R. Hughes**, A. Patel, A. Rosenkrantz. 2019. "Transcatheter Dialysis Conduit Procedures: Changing National and State-Level Medicare Utilization Patterns Over 15 Years," *Journal of Vascular and Interventional Radiology*, 30(7): 1050-1056

- [71] E. Gayou, M. Makary, **D.R. Hughes**, J. Hemingway, E. Elliot, J. Spain, L.M. Prevedello. 2019. "Nationwide Trends in Utilization of Catheter-Directed Therapy for Treatment of Pulmonary Embolism Among Medicare Beneficiaries from 2004-2016," *Journal of Vascular and Interventional Radiology*, 30(6): 801-806
- [72] D. Kishore, M. Horny, A. Rosenkrantz, J. Hemingway, **D.R. Hughes**, R. Duszak. 2019. "State-Level Variation in Inferior Vena Cava Filter Utilization Across Medicare and Commercially Insured Populations," *American Journal of Roentgenology*, 212(6): 1385-1392
- [73] M. Fleming, D. MacFarlane, L. Golding, G. McGinty, **D.R. Hughes**, R. Duszak. 2019. "Bundled Payment Models for Breast Cancer Screening Including Tomosynthesis," *Journal of the American College of Radiology*, 16(7): 902-907
- [74] A. Rosenkrantz, C.M. Hawkins, L.A. Deitte, J. Hemingway, **D.R. Hughes**, R. Duszak. 2019. "Invasive Procedural vs. Diagnostic Imaging and Clinical Services Rendered by Radiology Trainees Over Two Decades," *Journal of the American College of Radiology*, 16(6): 845-855 (**JACR Best of 2019 Award for Training and Education**)
- [75] A. Malhotra, X. Wu, H. Forman, C. Matouk, **D.R. Hughes**, D. Gandi, P. Sanelli. 2019. "Management of Unruptured Intracranial Aneurysms in Older Adults: A Cost-Effectiveness Analysis," *Radiology*, 291(2): 411-417
- [76] J. Chung, A. Rosenkrantz, J. Hemingway, **D.R. Hughes**, R. Duszak. 2019. "Increasing Utilization of Chest Imaging in United States Emergency Departments from 1994 to 2015," *Journal of the American College of Radiology*, 16(5): 674-682
- [77] A.M. Prabhakar, R. Gottumukkala, W. Wang, **D.R. Hughes**, R. Duszak. 2018. "Day of Week, Site of Service, and Patient Complexity Differences in Venous Ultrasound Interpreted by Radiologists vs. Non-radiologists," *Journal of the American College of Radiology*, 15(12): 1698-1703
- [78] P.E. Sharpe, N.U. Lall, **D.R. Hughes**, P.P. Harkey, R. Duszak. 2018. "Characteristics of Magnetic Resonance Neuroimaging Services Billed by Radiologists vs. Non-Radiologists," *American Journal of Neuroradiology*, 211(4): 827-830
- [79] A. Rosenkrantz, M. Glover, S.K. Kang, J. Hemingway, **D.R. Hughes**, R. Duszak. 2018. "Volume and Coverage of Secondary Imaging Interpretation Under Medicare, 2003-2016," *Journal of the American College of Radiology*, 15(10): 1394-1400
- [80] E. Morris, R. Duszak, A.K. Sista, J. Hemingway, **D.R. Hughes**, A. Rosenkrantz. 2018. "National Trends in IVC Filter Placement and Retrieval Procedures in the Medicare Population Over Two Decades," *Journal of the American College of Radiology*, 15(8): 1080-1086
- [81] S.K. Kang, M. Jiang, R. Duszak, S. Heller, **D.R. Hughes**, L. Moy. 2018. "Use of Breast Cancer Screening and Its Association with Later Use of Preventive Services among Medicare Beneficiaries," *Radiology*, 288(3): 660-668
- [82] P. Sharp, P. Harkey, W. Wang, **D.R. Hughes**, N. Lall, R. Duszak. 2018. "Day of Week, Site of Service, and Patient Complexity Disparities in Musculoskeletal MRI Interpretations by Radiologists vs. Non-Radiologists," *American Journal of Roentgenology*, 211(4): 827-830
- [83] A. Rosenkrantz, K. Hoque, J. Hemingway, **D.R. Hughes**, R. Duszak. 2018. "Unique Medicare Beneficiaries Served: A Radiologist-Focused Specialty-Level Analysis," *Journal of the American College of Radiology*, 15(5): 734-739

- [84] A. Rosenkrantz, D. Prologo, W. Wang, **D.R. Hughes**, Z. Bercu, R. Duszak. 2018. "Opioid Prescribing Behavior of Interventional Radiologists Across the United States," *Journal of the American College of Radiology*, 15(5): 726-733
- [85] **D.R. Hughes**. 2018. "Can You Do Health Disparities Research with Publicly Available Datasets?" *Academic Radiology*, 25(5): 552-555
- [86] D. Rosman, A. Rosenkrantz, W. Wang, **D.R. Hughes**, R. Duszak. 2018. "Changing Utilization of Non-Invasive Diagnostic Imaging Over Two Decades: An Examination Family Focused Analysis of Medicare Claims Using the Neiman Imaging Types of Service Categorization System." *American Journal of Roentgenology*, 210(2): 364-368
- [87] A. Rosenkrantz, W. Wang, **D.R. Hughes**, R. Duszak. 2018. "Generalist vs. Subspecialist Characteristics of the United States Radiologist Workforce." *Radiology*, 286(3): 929-937
- [88] A. Rosenkrantz, W. Wang, **D.R. Hughes**, R. Duszak. 2018. "A County-Level Analysis of the United States Radiologist Workforce: Physician Supply and Subspecialty Characteristics," *Journal of the American College of Radiology*, 15(4): 601-606
- [89] G. Sadigh, **D.R. Hughes**, W. Wang, B. Allen, G. McGinty, E. Silva, R. Duszak. 2018. "Radiologist Professional Payments Following Mitigation of CMS' Multiple Procedure Payment Reduction (MPPR) Initiatives." *Journal of the American College of Radiology*, 15(3): 390-395
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- [105] E. Silva III, G. McGinty, **D.R. Hughes**, R. Duszak. 2016. "Alternative Payment Models in Radiology: The Legislative and Regulatory Roadmap for Reform," *Journal of the American College of Radiology*, 13(10): 1176-1181 (**JACR Best of 2016 Award for Health Services Research & Policy**)
- [106] E. Silva III, G. McGinty, **D.R. Hughes**, R. Duszak. 2016. "Traditional Payment Models in Radiology: Historical Context for Ongoing Reform," *Journal of the American College of Radiology*, 13(10): 1171-1175
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- [127] A. Khaliq, E. Nsiah, N. Bilal, **D.R. Hughes**, R. Duszak. 2014. "The Scope and Distribution of Imaging Services at Critical Access Hospitals," *Journal of the American College of Radiology*, 11(9):857-862
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- [131] R. Duszak, N. Husain, D. Picus, **D.R. Hughes**, J. Xu, 2013. "Central Venous Access: Evolving Roles of Radiology and Other Specialties Nationally Over Two Decades," *Journal of the American College of Radiology*, 10(8): 603-612
- [132] M. Doodoo, R. Duszak, **D.R. Hughes**, 2013. "Trends in Utilization of Medical Imaging from 2003 to 2011: Clinical Encounters Offer a Complementary Patient-Centered Focus," *Journal of the American College of Radiology*, 10(7): 507-512
- [133] R. Duszak, B. Allen, **D.R. Hughes**, N. Husain, R.M. Barr, E. Silva III, W.D. Donovan, 2012. "Emergency Department Computed Tomography of the Abdomen and Pelvis: Preferential Utilization in Higher Complexity Patient Encounters," *Journal of the American College of Radiology*, 9(6): 409-413
- [134] M. Bhargavan, J. Sunshine, **D.R. Hughes**, 2011. "Clarifying the Relationship between Financial Self-interest and Imaging" *American Journal of Roentgenology*, 197(5): W891-899

#### INVITED LECTURES AND SEMINARS

- [1] Air Force Institute of Technology, Department of Systems and Engineering Management, Dayton, OH. December 1, 2009. "Evaluating Real Options for Source Selection in Multi-Stage Competitions under Budget Uncertainty."
- [2] University of Oklahoma Health Sciences Center, Department of Health Administration and Policy, Oklahoma City, OK. June 17, 2010. "Does Self-Referral for Imaging Reduce Episode Duration and Non-Imaging Costs?"
- [3] The Ohio State University, John Glenn School of Public Affairs, Columbus, OH, January 10, 2012, "The Pure Effect of Macroeconomic Fluctuations on Medical Care Utilization."
- [4] Tulane University, Department of Global Health Systems and Development, New Orleans, LA, January 24, 2012, "The Pure Effect of Macroeconomic Fluctuations on Medical Care Utilization."
- [5] George Washington University, Department of Health Policy, Washington, DC, December 3, 2012, "The Effect of Macroeconomic Conditions on the Care Decisions of the Employed."

- [6] Thomas Jefferson University, Department of Radiology, Philadelphia, PA, December 19, 2012, "Repeat Medical Imaging: A Classification System for Meaningful Policy Analysis."
- [7] Emory University, Department of Radiology and Imaging Sciences, Atlanta, GA, May 2, 2013, "Radiology and Evolving Care Delivery and Payment Systems."
- [8] George Washington University, School of Nursing, Washington, DC, August 27, 2014, "Comparison of Diagnostic Imaging Ordering Patterns between Advanced Practice Providers and Primary Care Physicians following Office-based Evaluation and Management Visits."
- [9] University of Arkansas for Medical Sciences, Department of Health Policy and Management, Little Rock, AR, December 8, 2015, "Mitigating Small Provider Financial Risk under Prospective Bundled Payment Systems."
- [10] The Ohio State University, College of Public Health, Division of Health Services Management and Policy, Columbus, OH, December 10, 2015, "Mitigating Small Provider Financial Risk under Prospective Bundled Payment Systems."
- [11] George Mason University, Center for Micro-Economic Policy Research, Arlington, VA, March 22, 2016, "The Effect of Utilization Regulation: The Case of CT Scans and the Affordable Care Act."
- [12] Yale University, Department of Radiology, New Haven, CT, August 11, 2016, "Resources for Performing Health Policy and Health Services Research in Radiology."
- [13] University of Louisville, Department of Economics, Louisville, KY, February 3, 2017, "Public Reporting and Self-Regulation: Hospital Compare's Effect on Brain and Sinus Computed Tomography Utilization."
- [14] Georgia Institute of Technology, School of Economics, Atlanta, GA, February 17, 2017, "Public Reporting and Self-Regulation: Hospital Compare's Effect on Brain and Sinus Computed Tomography Utilization."
- [15] Virginia Commonwealth University, Department of Health Administration, Richmond, VA, December 12, 2017, "Public Reporting and Self-Regulation: Hospital Compare's Effect on Brain and Sinus Computed Tomography Utilization."
- [16] National Dong Hwa University, Department of Finance, Hualien, Taiwan, March 21, 2018, "Public Reporting and Self-Regulation: Hospital Compare's Effect on Brain and Sinus Computed Tomography Utilization."
- [17] San Jose State University, Department of Economics, San Jose, CA, March 22, 2019, "Disparities in Access to Advanced Medical Imaging in Urban and Rural Settings."
- [18] Yale University, Department of Radiology, Neuroimaging Section, New Haven, CT, July 7, 2019, "Translating Research into Policy: Overview and Applications to Emergency Department Neuroimaging."
- [19] Centers for Disease Control, Atlanta, GA, August 22, 2019, "Disparities in Access to Advanced Medical Imaging in Urban and Rural Settings."
- [20] Cornell University, Center for Veterinary Business and Entrepreneurship, Ithaca, NY, October 2, 2019, "Payments, Access, and Regulation: Provider Participation and Behavior in U.S. Health Care Markets."

- [21] Thomas Jefferson University, Department of Radiology, Philadelphia, PA, November, 4, 2019, “Payments, Access, and Regulation: Provider Participation and Behavior in U.S. Health Care Markets.”
- [22] Georgia Institute of Technology, Nuclear & Radiological Engineering and Medical Physics Program, Atlanta, GA, October 22, 2020, “Payments, Access, and Regulation: Provider Participation and Behavior in U.S. Health Care Markets.”
- [23] University of South Alabama, Department of Economics, Finance, and Real Estate, Mobile, AL, October 12, 2021, “An Examination of Changes in Certified Nurse Midwife Scope of Practice on Antenatal Care and Maternal Outcomes.”
- [24] Arizona State University, College of Health Solutions, Phoenix, AZ, March 29, 2022, “Association Between Patient Cost-Sharing and Use of Diagnostic Breast Imaging after a Positive Mammogram.”
- [25] University of Kentucky, Department of Health Management and Policy, Lexington, KY, April 8, 2022, “Association Between Patient Cost-Sharing and Use of Diagnostic Breast Imaging after a Positive Mammogram.”
- [26] University of Louisville, Department of Economics, Louisville, KY, October 14, 2022, “Healthy reviews! Online physician ratings reduce healthcare interruptions.”
- [27] Ball State University, Department of Economics, Muncie, IN, October 20, 2022, “Healthy reviews! Online physician ratings reduce healthcare interruptions.”

#### **PRESENTATIONS AT PROFESSIONAL AND SCIENTIFIC MEETINGS**

- [1] Military Operations Research Society, 72<sup>nd</sup> MORS Symposium, June 22-24, 2004, Monterey, CA, “Advantages, Disadvantages, and Uses of Generalized Activity Networks,” (with D. Lee and Y. Whitaker). (***Best paper award: Cost Analysis Track. Barchi Prize Nominee for best conference paper***)
- [2] Econometric Society, 59<sup>th</sup> European Meetings, August 19-24, 2004, Universidad Carlos III, Madrid, Spain, “A Better Technology Frontier: Estimating Aggregate Frontiers with Sector Data.”
- [3] Department of Defense Cost Analysis Symposium, 38<sup>th</sup> Annual Meetings, February 15-18, 2005, Williamsburg, VA, “Advantages, Disadvantages, and Uses of Generalized Activity Networks: Coriolis Case Study” (with Y. Whitaker, D. Lee, and J. Eckhause)
- [4] Southern Economics Association, 76<sup>th</sup> Annual Meetings, November 18-21, 2006, Charleston, S.C., “Real Options for Public Sector R&D Investments,” (with J. Eckhause)
- [5] National Defense Industrial Association, 23<sup>rd</sup> Annual National Test and Evaluation Conference, March 12-15, 2007, Hilton Head Island, S.C., “Estimating Durations and Trials to Success in Test Programs,” (with J. Eckhause)
- [6] Southern Economics Association, 77<sup>th</sup> Annual Meetings, November 19-21, 2007, New Orleans, LA, “Trade and Aggregate Efficiency: A Stochastic Frontier Approach.”
- [7] Econometric Society, 63<sup>rd</sup> European Meetings, August 27-31, 2008, Milan, Italy, “Innovation, Firm Efficiency, and Market Structure”
- [8] Southern Economics Association, 78<sup>th</sup> Annual Meetings, November 20-23, 2008, Washington, D.C., “Clergy Labor Supply: Evidence from Seminary Enrollment,” (with D. T. Mitchell and D. Molinari)

- [9] Southern Economics Association, 78<sup>th</sup> Annual Meetings, November 20-23, 2008, Washington, D.C., “Frontiers of Rentseeking in the U.S. States,” (with D. T. Mitchell and N. Campbell)
- [10] Association of American Medical Colleges, 5<sup>th</sup> Annual Physician Workforce Research Conference, April 30-May 1, 2009, Washington, D.C., “The Productivity and Efficiency of Radiology Practices,” (with J. Sunshine, C. Meghea, and M. Bhargavan)
- [11] AcademyHealth, Annual Research Meeting, June 28-30, 2009, Chicago, IL, “The Relationship of Financial Self-Interest in Imaging to Economic and Medical Outcomes,” (with M. Bhargavan and J. Sunshine)
- [12] International Health Economics Association, 7<sup>th</sup> World Congress, July 12-15, 2009, Beijing, China, “The Relationship of Financial Self-Interest in Imaging to Economic and Medical Outcomes,” (with M. Bhargavan and J. Sunshine)
- [13] Southern Economics Association, 79<sup>th</sup> Annual Meetings, November 21-23, 2009, San Antonio, TX, “The Relationship of Financial Self-Interest in Imaging to Economic and Medical Outcomes” (with M. Bhargavan and J. Sunshine)
- [14] American Society of Health Economists, 3<sup>rd</sup> Biennial Conference, June 20-23, 2010, Ithaca, NY, “The Relationship of Self-Referral for Imaging to Cost Outcomes for Patients with Chronic Conditions” (with M. Bhargavan and J. Sunshine)
- [15] American Society of Health Economists, 3<sup>rd</sup> Biennial Conference, June 20-23, 2010, Ithaca, NY, “Does financial self-interest in imaging genuinely give rise to increased utilization?” (with M. Bhargavan and J. Sunshine)
- [16] Southern Economics Association, 80<sup>th</sup> Annual Meetings, November 20-22, 2010, Atlanta, GA, “Medical Utilization and the Business Cycle”
- [17] International Health Economics Association, 8<sup>th</sup> World Congress, July 10-13, 2011, Toronto, Canada, “The Pure Effect of Macroeconomic Fluctuations on Medical Care Utilization,”
- [18] American Public Health Association, 139<sup>th</sup> Annual Meeting, October 29-November 2, 2011, Washington, DC, “The Pure Effect of Macroeconomic Fluctuations on Medical Care Utilization,”
- [19] Southern Economics Association, 81<sup>st</sup> Annual Meetings, November 19-21, 2011, Washington, DC, “Are Acute or Chronic Patients Physician Profit Centers?”
- [20] INFORMS Annual Meeting 2013, October 6-9, 2013, Minneapolis, MN, “Pricing Medical Practice Services to Minimize Revenue Risk under Bundled Payment Models,” (with J. Eckhause)
- [21] Radiological Society of North America, 99<sup>th</sup> Scientific Assembly and Annual Meeting, December 1-6, 2013, Chicago, IL, Panel Member: “Health Policy Initiatives in Medical Imaging: Promoting Value and Relevancy in Evolving Healthcare Delivery and Payment Systems.”
- [22] Association of University Radiologists, 62<sup>nd</sup> Annual Meeting, April 1-4, 2014, Baltimore, MD, “Health Services Research and Radiology.”
- [23] Association of American Medical Colleges, 10<sup>th</sup> Annual Physician Workforce Research Conference, May 1-2, 2014, Washington, DC, “Comparison of Diagnostic Imaging Ordering Patterns between Mid-level Practitioners and Primary Care Physicians for Office-based Evaluation and Management Visits,” (with M. Jiang and R. Duszak)
- [24] Society for Pediatric Radiology, 57<sup>th</sup> Annual Meeting, May 14-17, 2014, Washington, DC, **(Invited)** “Payment for Value: Radiology in a post-ACA World.”

- [25] International Health Economics Association, 10<sup>th</sup> World Congress, July 13-16, 2014, Dublin, Ireland, “Comparison of Diagnostic Imaging Ordering Patterns between Advanced Practice Providers and Primary Care Physicians for Office-based Evaluation and Management Visits,” (with M. Jiang and R. Duszak)
- [26] INFORMS Annual Meeting 2014, November 9-12, 2014, San Francisco, CA, “Mitigating Specialty Provider Financial Risk in Prospective Bundled Payment Systems,” (with N. Bilal)
- [27] American Public Health Association, 142<sup>nd</sup> Annual Meeting, November 15-19, 2014, New Orleans, LA, “Screening Mammography Rate Before and After the 2009 USPSTF Guideline: An Interrupted Time Series Analysis,” (with M. Jiang and R. Duszak)
- [28] Southern Economics Association, 84<sup>th</sup> Annual Meeting, November 22-24, 2014, Atlanta, GA, “Health Outcomes and State Regulation: An Empirical Approach,” (with M. Mitchell)
- [29] American College of Radiology 2015 Meetings, May 14-19, 2015, Washington, DC, “Leveraging Data for Alternative Payment Model Development.”
- [30] INFORMS Annual Meeting 2015, November 1-4, 2015, Philadelphia, PA, “Mitigating Small Provider Financial Risk Under Prospective Bundled Payment Systems,” (with J. Eckhause)
- [31] Radiological Society of North America, 101<sup>st</sup> Scientific Assembly and Annual Meeting, November 30-December 1-5, 2015, Chicago, IL, “The Future of Radiology Payments: Can Analytics Help Radiologists Regain Control?”
- [32] Association of University Radiologists, 64<sup>th</sup> Annual Meeting, March 29-April 1, 2016, San Diego, CA, “Can You Do Health Disparities Research with Publicly Available Data Sets?”
- [33] American College of Radiology 2016 Meetings, May 15-19, 2016, Washington, DC, “The Crossroads of Quality, Data, and Informatics in Radiology Practice and Payment Models,”
- [34] American Society of Health Economists, 6<sup>th</sup> Biennial Conference, June 12-15, 2016, Philadelphia, PA, “The Effect of Utilization Regulation: The Case of CT Scans and the Affordable Care Act,” (with D. Deyo)
- [35] Radiology Business Management Association, Fall Educational Conference, Sep 25-27, 2016, New Orleans, LA, (**Keynote**), “Adapting to New Payment Models: Metrics and Data Analytics Can Guide the Way.”
- [36] INFORMS Annual Meeting 2016, Nov 13-16, 2016, Nashville, TN, “Optimal Care Pathways for Lower Back Pain Patients,” (with J. Eckhause, K. Best)
- [37] Southern Economics Association, 86<sup>th</sup> Annual Meeting, November 19-21, 2016, Washington, DC, “The Effect of Utilization Regulation: The Case of CT Scans and the Affordable Care Act,” (with D. Deyo)
- [38] ACR-RBMA Practice Leaders Forum, January 13-15, 2017, Orlando, FL, (**Invited**), “Bundled Payment Survival Tools.”
- [39] American College of Radiology 2017 Annual Meeting, May 21-25, 2017, Washington, DC, “Alternative Payment Modeling in Radiology: The Screening Mammography Bundle.”
- [40] American College of Radiology 2017 Annual Meeting, May 21-25, 2017, Washington, DC, “Understanding Costs in Radiology and Healthcare: Society’s Perspective.”

- [41] International Health Economics Association, 12<sup>th</sup> World Congress, July 7-11, 2017, Boston, MA, “Public Reporting and Self-Regulation: Hospital Compare's Effect on Brain and Sinus Computed Tomography Utilization,” (with D. Deyo)
- [42] California Radiological Society, CRS and LARS Joint Mid-Winter Meeting, January 20-21, 2018, Pasadena, CA, **(Plenary)**, “How Research on Health Policy Translates to Change in Policy.”
- [43] California Radiological Society, CRS and LARS Joint Mid-Winter Meeting, January 20-21, 2018, Pasadena, CA, “What is the Neiman Policy Institute and How can its Tools be used to Understand Radiology Utilization and Payment.”
- [44] South Coast Radiology Society, February 27<sup>th</sup>, 2018, Santa Barbara, CA, **(Keynote)**, “Where Do Radiologists Fit in the Shift from Volume to Value?”
- [45] Radiology Business Management Association, 2018 PARADIGM Meeting, San Diego, CA, April 5-8, 2018, **(Keynote)**, “Translational Health Policy Research: Radiology’s Big Data Imperative.”
- [46] American Society of Neuroradiology, 56<sup>th</sup> Annual Meeting, June 2-7, 2018, Vancouver, Canada, “The Use and Usefulness of Emergency Neuroimaging.”
- [47] American Society of Neuroradiology, 56<sup>th</sup> Annual Meeting, June 2-7, 2018, Vancouver, Canada, **(Invited Panel)**, “Deciphering the Current Healthcare Landscape: Hear from the Experts.”
- [48] American Society of Neuroradiology, 56<sup>th</sup> Annual Meeting, June 2-7, 2018, Vancouver, Canada, “Resources for Radiologists Participating in an Alternative Payment Model.”
- [49] Emory University, 6<sup>th</sup> Annual Health Services Research Day, May 15<sup>th</sup>, 2019, Atlanta, Georgia, “Availability of Primary and Specialist Care in Rural Communities.”
- [50] Western Economics Association, 95<sup>th</sup> Annual Meeting, June 28-July 2, 2019, San Francisco, CA, “Crossing State Borders: The Interstate Medical Licensure Compact and Hospital Quality,” (with Darwyn Deyo)
- [51] Agricultural & Applied Economics Association, Annual Meeting, July 21-23, 2019, Atlanta, GA, “Big Data and the Econometrics of Health.”
- [52] Society of Nuclear Medicine & Molecular Imaging, March 22-23, 2022, Bethesda, MD, **(Invited Panel)**, “Health Disparities in Imaging: Lessons learned in mammography and prostate imaging and clinical trial participation.”

#### **POSTERS AT PROFESSIONAL AND SCIENTIFIC MEETINGS**

- [1] American Society of Health Economists, 3<sup>rd</sup> Biennial Conference, June 20-23, 2010, Ithaca, NY, “The Relationship between the Business Cycle & Medical Care Utilization.”
- [2] AcademyHealth, Annual Research Meeting, June 27-29, 2010, Boston, MA, “The Relationship of Self-Referral for Imaging to Cost Outcomes for Patients with Chronic Conditions,” (with M. Bhargavan and J. Sunshine)
- [3] AcademyHealth, Annual Research Meeting, June 27-29, 2010, Boston, MA, “Does Financial Self-Interest in Imaging Genuinely Give Rise to Increased Utilization?” (with M. Bhargavan and J. Sunshine)
- [4] AcademyHealth, Annual Research Meeting, June 27-29, 2010, Boston, MA, “The Relationship between Radiology Utilization and Medical Care Utilization over the Business Cycle.”



- [5] American Public Health Association, 138<sup>th</sup> Annual Meeting, November 6-10, 2010, Denver, CO, “Does Financial Self-Interest in Imaging Genuinely Give Rise to Increased Costs?” (with M. Bhargavan and J. Sunshine)
- [6] AcademyHealth, Annual Research Meeting, June 23-25, 2013, Baltimore, MD, “Latest USPSTF Updates in Screening Mammography Guidelines have had Minimal Impacts on Practice,” (with M. Doodoo and R. Duszak)
- [7] American College of Radiology Annual Meeting and Chapter Leadership Conference, April 26-30, 2014, Washington, DC, “Visible Radiologists: Providing Bedside Consultation,” (with J. Wright, J. Walsh, L. Gimber, T. Elani, and E. Krupinski)
- [8] AcademyHealth, Annual Research Meeting, June 8-10, 2014, San Diego, CA, “The Scope and Distribution of Diagnostic and Therapeutic Imaging Services at Critical Access Hospitals in the U.S.,” (with A. Khaliq, E. Nsiah, N. Bilal, and R. Duszak)
- [9] AcademyHealth, Annual Research Meeting, June 8-10, 2014, San Diego, CA, “Comparison of Diagnostic Imaging Ordering Patterns between Advanced Practice Providers and Primary Care Physicians for Office-based Evaluation and Management Visits,” (with M. Jiang and R. Duszak)
- [10] AcademyHealth, Annual Research Meeting, June 8-10, 2014, San Diego, CA, “Using Claims Data to Assess County and State Level Access to Care,” (with E. Nsiah)
- [11] AcademyHealth, Annual Research Meeting, June 8-10, 2014, San Diego, CA, “Screening Mammography Rate Before and After the 2009 USPSTF Guideline: An Interrupted Time Series Analysis,” (with M. Jiang and R. Duszak)
- [12] Radiological Society of North America, 100<sup>th</sup> Scientific Assembly and Annual Meeting, November 30-December 1-5, 2014, Chicago, IL, “Liver and Kidney Biopsies: Changing Roles of Radiologists and Other Specialists from 1991 - 2012.” (with W. Angel, C.M. Hawkins, J. Wang, and R. Duszak)
- [13] Radiological Society of North America, 100<sup>th</sup> Scientific Assembly and Annual Meeting, November 30-December 1-5, 2014, Chicago, IL, “Traditional Text vs. Image and Interactive Data Embedded Multimedia Enhanced Radiology Reporting: Referring Physicians' Perceptions about Value.” (with G. Sadigh, T. Hertwick, C. Kao, P. Wood, and R. Duszak)
- [14] American College of Radiology 2015, May 14-19, 2015, Washington, DC, “Medicare Payment for Secondary Interpretation of Diagnostic Imaging: CT Trends from 1999 to 2012.” (with M. Lu, J. Hemingway, T. Hallett, R. Duszak, U. Hoffmann). **Gold-Merit Award Winner**
- [15] American College of Radiology 2015, May 14-19, 2015, Washington, DC, ““Double Scans” of the Chest: Trends in Medicare Utilization By Specialty and Site of Service.” (with J. Flug, J. Hemingway, and R. Duszak). **Gold-Merit Award Winner**
- [16] AcademyHealth Annual Research Meeting, June 14-16, 2015, Minneapolis, MN, “The Right Care By the Right Clinician: A Comparison of Diagnostic Imaging Ordering Patterns Between Nurse Practitioners and Primary Care Physicians.” (with M. Jiang and R. Duszak)
- [17] American Public Health Association, 143<sup>rd</sup> Annual Meeting, Oct 31-Nov 4, 2015, Chicago, IL, “The Right Care By the Right Clinician: A Comparison of Diagnostic Imaging Ordering Patterns Between Nurse Practitioners and Primary Care Physicians.” (with M. Jiang and R. Duszak)
- [18] American College of Radiology, 2016 Meetings, May 15-19, 2016, Washington, DC, “Changing Utilization of Brain Imaging in the Emergency Department: Perspectives from Nearly Two Decades of National Medicare Claims,” (with S. Patel, J. Hemingway, J. Rawson, R. Duszak) **Gold-Merit Award Winner**

- [19] American College of Radiology, 2016 Meetings, May 15-19, 2016, Washington, DC, “Changing Utilization Patterns of Cervical Spine Imaging in the Emergency Department Setting: Perspectives from Two Decades of National Medicare Claims,” (with G. Gan, P. Harkey, J. Hemingway, R. Duszak) **Gold-Merit Award Winner**
- [20] American Society of Health Economists, 6<sup>th</sup> Biennial Conference, June 12-15, 2016, Philadelphia, PA, “The Effect of Medicare's Annual Wellness Visit on Preventive Care,” (with M. Jiang and Wenyi Wang)
- [21] AcademyHealth, Annual Research Meeting, June 26-28, 2016, Boston, MA, “The Effect of Utilization Regulation: The Case of CT Scans and the Affordable Care Act,” (with D. Deyo)
- [22] American College of Radiology, 2017 Annual Meeting, May 21-25, 2017, Washington, DC, “Downstream Imaging Utilization Following Emergency Department Ultrasound Interpreted by Radiologists vs. Non-Radiologists: A Medicare Claims-Based Study,” (with B. Allen, V. Carroll, J. Hemingway, A. Rosenkrantz, R. Duszak) **Gold-Merit Award Winner**
- [23] Society of Abdominal Radiology, 2018 Annual Meeting, March 4-9, 2018, Scottsdale, AZ, “Increasing Utilization of Pre-Biopsy Prostate MRI: A National Medicare Perspective from 2011-2015,” (with A. Rosenkrantz, J. Hemingway, R. Duszak, J. Weinreb)
- [24] American Roentgen Ray Society, 118<sup>th</sup> Annual Meeting, April 22-27, 2018, Washington, DC, “Temporal and Site Differences in Venous Ultrasounds Interpreted by Radiologists and Non-radiologists,” (R. Gottumukkala, R. Duszak, W. Wang, A. Prabhakar)
- [25] AcademyHealth, Annual Research Meeting, June 24-25, 2018, Seattle, WA, “Just What The Doctor Ordered: Tort Reforms and Hospital Imaging Utilization,” (with D. Deyo, D. Mitchell)
- [26] American College of Radiology, 2019 Annual Meeting, May 18-22, 2019, Washington, DC, “Trends and Disparities in United States Emergency Department Utilization of Computed Tomography for Suspected Urolithiasis,” (with P. Balthazar, G. Sadigh, A. Rosenkrantz, T. Hanna, R. Duszak) **Gold-Merit Award Winner**
- [27] American Society of Health Economists, June 23-26, 2019, Washington, DC, “Access to Advanced Medical Imaging Procedures in Rural and Critical Access Hospitals,” (with L. Chaves, T. Hanna)
- [28] American Society of Health Economists, June 23-26, 2019, Washington, DC, “Crossing State Borders: The Interstate Medical Licensure Compact and Hospital Quality,” (with D. Deyo)
- [29] International Health Economics Association, July 13-17, 2019, Basel, Switzerland, “Disparities in Access to Medical Imaging in Rural and Critical Access Hospitals in the United States,” (with L. Chaves, T. Hanna)
- [30] American College of Radiology, 2021 Annual Meeting, May 15-19, 2021, Washington, DC, “Stroke Thrombectomy Service and Recent Provider Trends in U.S. Medicare Beneficiaries,” (with A.R. Chatterjee, K. Jayaraman, S. Santavicca, J. Hirsch, R. Duszak)
- [31] American College of Radiology, 2021 Annual Meeting, May 15-19, 2021, Washington, DC, “Characteristics of the United States Neurointerventionalist Workforce,” (with A.R. Chatterjee, K. Jayaraman, S. Santavicca, J. Hirsch, R. Duszak)
- [32] American College of Radiology, 2022 Annual Meeting, April 24-26, 2022, Washington, DC, “Radiology Practices Employing Nurse Practitioners and Physician Assistants: Characteristics and Trends from Recent Years,” (with S. Santavicca, A. Rosenkrantz, E. Rubin, R. Duszak) **Gold-Merit Award Winner**

## SPONSORED RESEARCH

- [1] Hillsborough County Department of Economic Development  
2002  
*Economic Patterns in Hillsborough County in 1999: Hillsborough County Zip Code Business and Employment Patterns Analysis* (PI: Hughes, Danny)  
Amount Awarded: \$5,000 Role: Principal Investigator
- [2] Los Alamos National Laboratory  
2003  
*Electric Power and Natural Gas Outage Study* (PI: Colie, Dennis)  
Amount Awarded: \$50,000 Role: Co-investigator
- [3] Logistics Management Institute  
2006-2007  
*Analytical Methods for Public Sector Acquisition Decisions* (PI: Hughes, Danny)  
Amount Awarded: \$90,000 Role: Principal Investigator
- [4] American College of Radiology  
2011  
*Economics of Diagnostic Imaging* (PI: Hughes, Danny)  
Amount Awarded: \$65,000 Role: Principal Investigator
- [5] Oklahoma Health Information Exchange Trust  
2011-2012  
*Gap Analysis* (PI: Hughes, Danny)  
Amount Awarded: \$195,039 Role: Principal Investigator
- [6] Centers for Medicare and Medicaid Services (HHSM-500-2011-00015I/HHSM-500-T0004)  
2011-2016  
*Post-Reform Consumer Landscape Market Analytics and Implementation* (PI: Moser, Jim)  
Amount Awarded: \$15,600,000 Role: Co-investigator
- [7] National Institute of Arthritis and Musculoskeletal and Skin Diseases (1P30AR072572-01)  
2017-2022  
*UW Core Center for Clinical Research (CCCR) of Musculoskeletal Conditions* (PI: Jarvik, Jeffrey)  
Amount Awarded: \$3,750,000 Role: Co-investigator
- [8] American College of Radiology  
2018  
*The Effect of Emerging Health Care Delivery and Payment Models on the Provision of Medical Imaging Services* (PI: Danny Hughes)  
Amount Awarded: \$74,885 Role: Principal Investigator
- [9] American College of Radiology (Cost Reimbursement Agreement #138861)  
2018-2023  
*Health Economics and Analysis Lab* (PI: Danny Hughes)  
Amount Awarded: \$3,310,178 Role: Principal Investigator
- [10] Ivan Allen College Incentive for Creativity in Research Grant  
2020  
*Travel Grant* (PI: Danny Hughes)  
Amount Awarded: \$850 Role: Principal Investigator

[11] Georgia Tech 2020 Small Bets Seed Grant  
2020-2021  
*Optimizing Lung Cancer Screening for Vulnerable, High Risk Populations* (PI: Danny Hughes)  
Amount Awarded: \$71,247 Role: Principal Investigator

[12] Ivan Allen College Incentive for Creativity in Research Grant  
2021  
*Summer GRA Support* (PI: Danny Hughes)  
Amount Awarded: \$3,100 Role: Principal Investigator

## **TECHNICAL PAPERS AND RESEARCH REPORTS**

- [1] “Economic Patterns in Hillsborough County in 1999: Hillsborough County Zip Code Business and Employment Patterns Analysis,” *Center for Economic Development Research Report*, University of South Florida, Sep 2002
- [2] “Land Use in Hardee County,” *Center for Economic Development Research Report*, University of South Florida, Feb 2003
- [3] “Electric Power and Natural Gas Outage Study,” with D. Colie, *Center for Economic Development Research Report*, University of South Florida, Mar 2003
- [4] “Integrated Performance Cost Model: Conceptual Approach,” with G. Belcher, D. Lee, J. Villani, K. Willstatter, A. Valentine, and G. B. Chadwell, *Logistics Management Institute #AR314TI*, Sep 2003
- [5] “Test and Evaluation Cost Estimating Handbook: Work Breakdown Structures and Data Dictionaries,” with K. Cincotta, I. Cook, R. Hemm, Y. Whitaker, *Logistics Management Institute #AR329TI*, Sep 2004
- [6] “An Approach to Developing an Enterprise Simulator for NASA’s Aeronautics Research Mission Directorate,” with J. Gribko, G. Pickney, V. Stouffer, *Logistics Management Institute #NS359TI*, Sep 2004
- [7] “High-Level Model for Forecasting DOD Depot Maintenance Funding Requirements,” with G. Belcher, R. Steans, V. Stouffer, *Logistics Management Institute #PA505TI*, Dec 2005
- [8] “Beyond Fee-For-Service: Emerging Payment Models in Radiology,” with R. Duszak, *The Neiman Report*, No. 3, June 2013

## **HONORS AND AWARDS**

### **Georgia Institute of Technology**

Ivan Allen College Faculty Excellence in Research (2022)  
Ivan Allen College Million Dollar Club (2021, 2022)  
Class of 1934 CIOS Honor Roll for Excellence in Teaching (2021)  
Ivan Allen College Gold Star Award (2019, 2020)  
Georgia Power Professor of Excellence (2018)  
Thank-A-Teacher Honoree (2018, 2019)

### **Papers and Presentations**

American College of Radiology Annual Meeting  
Gold Merit Award – Poster (2015 – x2; 2016 – x2; 2017; 2019; 2022)  
Military Operations Research Society Annual Meeting  
Best Paper, Cost Analysis Track (2004)  
*Journal of the American College of Radiology*

Best Paper, Training and Education (2019)  
Best Paper, Health Services & Policy (2016)  
Bronze Medalist for Exceptional Manuscript Review (2022)  
Exceptional Reviewer Award (2019, 2022)

*Women's Health Issues*

Charles E. Gibbs Leadership Prize for Best Paper (2015)

**Refereeing**

*Journal of the American College of Radiology*, Exceptional Reviewer Award (2019)

**United States Army**

Army Achievement Medal with Oak Leaf Cluster, Army Commendation Medal, National Defense Service Medal

**SERVICE ACTIVITIES**

**Editorial Service**

Editorial Board, *Journal of the American College of Radiology* (2015 – present)  
Guest Co-editor, special issue of *Journal of the American College of Radiology*, 2015

**National Panel Member:**

National Lung Cancer Roundtable, Implementation Strategies Workgroup (2019 – 2020)  
Society for Interventional Radiology Foundation, Research Consensus Panel (2019)  
NIH/RSNA/ACR Expert Panel on Gadolinium Deposition: What We Know and Don't Know, A Research Roadmap (2018)  
CDC Expert Panel on Lung Cancer Screening Surveillance (2013)

**External Advisory Boards:**

George Mason University, Health Informatics Program Advisory Board (2016 – 2018)

**External Review Panelist:**

National Science Foundation (2021)  
Dutch Organisation for Health Research and Development (ZonMW) (2020)

**Scientific Committee Member:**

American Public Health Association Annual Meeting (2009; 2015; 2016; 2019; 2020)  
American Society of Health Economists (2016; 2018)  
International Health Economics Association World Congress (2011; 2014; 2015; 2017; 2019; 2021)

**Workshops:**

Summer Healthcare Analytics Research Program (SHARP) (2021)

- Developed and hosted three-day workshop for assistant professors and advanced PhD students to address knowledge gaps in the use of large-scale medical claims datasets for academic research
- Inaugural workshop hosted 10 attendees from 7 institutions

**Peer Reviewer for:**

*Academic Radiology, Annals of Internal Medicine, American Journal of Managed Care, American Journal of Public Health, American Journal of Roentgenology, BMC Health Services Research, Cancer, Cancer Medicine, Computational Statistics and Data Analysis, Economic Inquiry, Environmental Protection Agency, EURO Journal on Decision Processes, Health Affairs, Health Policy and Technology, Health Services Research, IEEE Transactions on Engineering Management, IIE Transactions on Healthcare Systems Engineering, International Journal of Project Management, JAMA Internal Medicine, Journal of the American College of Radiology, Journal of the National Comprehensive Cancer Network, Journal of Neuroimaging, Journal of Public Health Dentistry,*

*Journal of Radiation Research and Applied Sciences, Journal of Rural Health, Medical Care, Natural Resource Modeling, Postgraduate Medicine, Preventive Medicine, Public Finance Review, Southern Journal of Entrepreneurship, Women's Health Issues*

**Conference Session Chair:**

American Economic Association Annual Meeting (2012)  
Association of University Radiologists (2014)  
INFORMS (2015)  
International Health Economics Association World Congress (2009; 2014; 2015)  
Southern Economics Association Annual Meeting (2009, 2021)

**University Service:**

***Arizona State University***

*College Service:* Research Council (2023 – Present)

***Georgia Institute of Technology***

*University Service:* Library Faculty Advisory Board (2018 – 2021)  
Office of Information Technology Faculty Advisory Committee  
(2022 – Present)

*Department Service:* MS Economics Committee (2018 – 2021)  
Faculty Search Committee (2018; 2019 (x2) – *Chair (x1)*; 2021 – *Chair*)

***University of Oklahoma***

*University Service:* IT Advisory Committee (2011 – 2012)  
*College Service:* Academic Appeals Board (2012 – 2012)  
Bylaws Committee (2011 – 2012)  
Professional Practice Plan Committee (2011 – 2012)  
*Department Service:* Faculty Search Committee (2011 – 2012)

***University of South Alabama***

*College Service:* Faculty Development Committee (2004 – 2008)

**Community Service:**

Greater Tampa Chamber of Commerce, Subcommittee for Foreign Direct Investment (2002 – 2003)  
Downtown Mobile Alliance, Retail Development Committee (2007 – 2008)  
Mississippi Department of Archives and History, Statistical Consultant *pro bono* (2011 – 2012)

**PH.D. DISSERTATION COMMITTEE SERVICE**

***Georgia Institute of Technology***

Chair: Mary Motolenich, *Economics* (expected May 2024)  
Trevor Wallace, *Economics* (expected May 2023)

Committee Member: Xiaoyu Dong, *Economics* (expected May 2023)

***University of Georgia***

Committee Member: Lauren Blumberg, *Economics* (2021)

***University of Maryland***

Committee Member: Jeremy Eckhause, *Civil and Environmental Engineering* (2011)  
Sirapong Vilalai, *Civil and Environmental Engineering* (2008)

**MPH PRACTICUM/CAPSTONE COMMITTEE SERVICE**

***George Mason University***

Preceptor: Meghan Kurtz, *MS Health Policy* (2014)

Aditya Kaushik, *MS Health Policy* (2013)

**University of Oklahoma**

Chair: Iman Haynes, *MPH Health Policy* (2012)

Thanh Nguyen, *MPH Health Policy* (2012)

Committee Member: Sandra Carter, *MPH Biostatistics* (2011)

**INDEPENDENT RESEARCH/STUDY**

**Georgia Institute of Technology**

Supervisor: Sam Gyorfí, *BS Industrial Engineering* (2020)

Stefan Santavicca, *MS Economics* (2019)

Candice Sessa, *MS Economics* (2019)

Katherine Anthony, *MS Economics* (2019)

Kirti Prabhakar, *MS Economics* (2018)

Shannon Murray, *MS Economics* (2018)

**University of South Alabama**

Supervisor: David Molinari, *BS Economics* (2008)

**TEACHING EXPERIENCE**

**Professor/Visiting Professor**, Georgia Institute of Technology,  
School of Economics, 08/2017 – Present

Undergraduate Courses:

Industrial Organization

Graduate Courses (MS):

Health Economics

Economics and Analysis of Healthcare Data

Industrial Organization

Cost Benefit Analysis

Introduction to Probability and Statistics

**Assistant Professor**, University of Oklahoma,  
Department of Health Administration and Policy, 01/2011 – 08/2012

Graduate Courses (MHA & MPH):

Operations Research

Health System Financial Management

**Assistant Professor**, University of South Alabama,  
Department of Economics & Finance, 08/2004 – 08/2008

Undergraduate Courses:

Introduction to Economics (non-majors)

Principles of Microeconomics

Principles of Macroeconomics

Industrial Organization

International Trade

Introduction to Econometrics

Graduate Courses (MBA):

Economic Theory

**Graduate Instructor**, University of Georgia,  
Department of Economics, 05/1999 – 12/2002

Undergraduate Courses (full course responsibility):

Principles of Macroeconomics

Economics of Environmental Quality

## Economics of Human Resources