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Dr. Kirson is an applied health economist with extensive experience in health economics and outcomes research (HEOR), strategy and market access, and complex litigation matters. He specializes in the application of advanced statistical methods to the analysis of a variety of real-world and clinical data, as well as the development of advanced modeling tools. He has worked closely with many different stakeholders in the health care industry, including biopharmaceutical and device manufacturers, payers, government agencies, leading law firms, and academic experts. Dr. Kirson has managed numerous HEOR and strategy projects, including novel cost-effectiveness analyses, submissions to health technology assessment (HTA) organizations, the design of outcomes-based contracts, the analysis of pharmaceutical pricing, burden-of-illness studies, comparative-effectiveness research, and budget impact assessments. In the regulatory context, he has supported a successful 510(k) pre-market submission to the US Food and Drug Administration (FDA) on behalf of a medical device manufacturer, including the presentation of statistical analyses to an FDA advisory panel. In litigation, Dr. Kirson's case work has included the evaluation of antitrust matters in the health care sector and the assessment of issues pertaining to the False Claims Act. His work has resulted in numerous conference presentations and peer-reviewed publications, including in *Health Affairs*, *Alzheimer's & Dementia*, *Diabetes Care*, *Critical Care Medicine*, the *Journal of Clinical Psychiatry*, and various pharmacoeconomic journals. He has also published in non-academic outlets such as *Health Affairs Blog*, *STAT*, and *Law360*. Dr. Kirson served on the board of the ISPOR Boston Regional Chapter, including a term as the Chapter President. He is also a member of the editorial board of the journal *Pharmacoeconomics Open*.

EDUCATION

2008	Ph.D., economics, Harvard University
2002	B.A., philosophy, political science, and economics, Hebrew University of Jerusalem

PROFESSIONAL EXPERIENCE

2008–Present	Analysis Group
2017–2023	ISPOR Boston Regional Chapter <i>Board Member and Chapter President</i>
2004–2008	Harvard University <i>Instructor and Teaching Fellow</i>
2001–2003	Hebrew University Jerusalem <i>Teaching Assistant</i>
1992–1999	Israeli Air Force <i>Captain</i>

PEER-REVIEWED PUBLICATIONS

Preston M, Hong A, Dufour R, Marden J, **Kirson N**, Gatoulis S, Kongara S, Gandhi R, Morgans A. Implications of Delayed Testosterone Recovery in Patients with Prostate Cancer. *Eur Urol Open Sci*. 2024 02;60: 32-35. doi: 10.1016/j.euros.2023.12.003. Epub 2024 Jan 11.

Chandler J, Georgieva M, Desai U, **Kirson N**, Lane H, Cheung HC, Westermeyer B, Biglan K. Disease Progression and Longitudinal Clinical Outcomes of Lewy Body Dementia in the NACC Database. *Neurol Ther*. 2023 02;12(1): 177-195. doi: 10.1007/s40120-022-00417-w. Epub 2022 Nov 15. PMID: 36378462

Kamath BM, Goldstein A, Howard R, Garner W, Vig P, Marden JR, Billmyer E, Anderson A, **Kirson N**, Jacquemin E, Gonzales E. Maralixibat Treatment Response in Alagille Syndrome is Associated with Improved Health-Related Quality of Life. *J Pediatr*. 2023 01;252: 68-75.e5. doi: 10.1016/j.jpeds.2022.09.001. Epub 2022 Sept 10. PMID: 36096175 Clinical Trial.

Kuehn M, LaMori J, DeMartino JK, Mesa-Frias M, Doran J, Korrapati L, Bhojwani R, Lefebvre P, **Kirson N**. Assessing barriers to access and equity for COVID-19 vaccination in the US. *BMC Public Health*. 2022 12 3;22(1): 2263. doi: 10.1186/s12889-022-14636-1. PMID: 36463172.

Edwards ML, Yin PT, Kuehn M, Bratti K, **Kirson N**, Jena A, Howell S. The Physician and Administrator-Reported Cost of Drug Utilization Management to Physician Practices: A Cross-Sectional Survey. *Pharmacoecon Open*. 2022 09;6(5): 711-721. doi: 10.1007/s41669-022-00351-5. Epub 2022 Jul 23. PMID: 35871127.

Desai U, Chandler J, Kirson N, Georgieva M, Cheung HC, Westermeyer B, Lane H, Biglan K. Epidemiology and economic burden of Lewy body dementia in the United States. *Curr Med Res Opin*. 2022 07;38(7): 1177-1188. doi: 10.1080/03007995.2022.2059978. Epub 2022 Apr 20. PMID: 35442134.

Kadokia A, Catillon M, Fan Q, Williams GR, Marden JR, Anderson A, **Kirson N**, Dembek C. The Economic Burden of Schizophrenia in the United States. *J Clin Psychiatry*. 2022 10 10 10;83(6): 22m14458. doi: 10.4088/JCP.22m14458. PMID: 36244006

Ebel NH, Goldstein A, Howard R, Mogul DB, Marden JR, Anderson A, Gaburo K, **Kirson N**, Rosenthal P. Health care resource utilization by patients with Alagille syndrome. *J Pediatr*. 2022 09 27: S0022-3476(22)00855-1. doi: 10.1016/j.jpeds.2022.09.033. Online ahead of print. PMID: 36179890.

Edwards ML, Yin PT, Kuehn M, Bratti K, **Kirson N**, Jena AB, Howell S. Physician perceptions of drug utilization management: Results of a national survey. *PLoS One*. 2022 09 20;17(9): e0274772. doi: 10.1371/journal.pone.0274772. eCollection 2022. PMID: 36126062.

DeMartino JK, Swallow E, Goldschmidt D, Yang K, Viola M, Radtke T, **Kirson N**. Direct health care costs associated with COVID-19 in the United States. *J Manag Care Spec Pharm*. 2022 09; 28(9): 936-947. doi: 10.18553/jmcp.2022.22050. Epub 2022 Jun 18. PMID: 35722829.

Hueth KD, Thompson-Leduc P, Totev TI, Milbers K, Timbrook TT, **Kirson N**, Hasbun R. Assessment of the Impact of a Meningitis/Encephalitis Panel on Hospital Length of Stay: A Systematic Review and Meta-Analysis. *Antibiotics (Basel)*. 2022 07 30;11(8): 1028. doi: 10.3390/antibiotics11081028. PMID: 36009898.

Thach A, **Kirson N**, Zichlin ML, Dieye I, Pappert E, Williams GR. Cost-Effectiveness of Apomorphine Sublingual Film as an "On-Demand" Treatment for "OFF" Episodes in Patients with Parkinson's Disease.

J Health Econ Outcomes Res. 2021 11 17;8(2): 82-92. doi: 10.36469/jheor.2021.29488. eCollection 2021. PMID: 35178465.

Thach A, Zichlin ML, **Kirson N**, Yang K, Gaburo K, Pappert E, Mehta D, Williams GR. Indirect comparison of apomorphine sublingual film and levodopa inhalation powder for Parkinson's disease 'OFF' episodes. *J Comp Eff Res.* 2022 01. Epub ahead of print 2022/01/25; doi: 10.2217/cer-2021-0178.

Kirson N, Swallow E, Lu J, Mesa-Frias M, Bookhart B, Maynard J, Shivdasani Y, Lefebvre P. The societal economic value of COVID-19 vaccines in the United States. *J Med Econ.* 2022 01; 25(1): 119-128. Epub ahead of print 2022/01/07; doi: 10.1080/13696998.2022.2026118.

Stuckey HL, Desai U, King SB, Popadic L, Levinson W, **Kirson NY**, Hankosky ER, Mitchell B. The experience of a severe hypoglycaemic event from the perspective of people with diabetes and their caregivers: "What am I going to do?." *Diabet Med.* 2021: e14745. Epub ahead of print 2021/11/20; doi: 10.1111/dme.14745.

DeSear KE, Thompson-Leduc P, Van Schooneveld TC, **Kirson N**, Chritton JJ, Ie S, Cheung HC, Ou S, Zimmer L, Schuetz P. Decreased antibiotic exposure using a procalcitonin protocol for respiratory infections and sepsis in US community hospitals (ProCommunity). *Curr Med Res Opin.* 2021 05; 37(5): 727-733. Epub ahead of print 2021/02/23; doi: 10.1080/03007995.2021.1893675.

Chen SY, Thompson-Leduc P, Sawyer RN, Fakhri I, Cheung HC, Macheca M, **Kirson NY**, Torbey M. Outcomes and resource use of patients with large hemispheric infarction and cerebral edema: analysis of real-world data. *Curr Med Res Opin.* 2021 03: 1-8. doi: 10.1080/03007995.2021.1900090.

Desai U, **Kirson NY**, Guglielmo A, Le HH, Spittle T, Tseng-Tham J, Shawi M, Sheehan JJ. Cost-per-remitter with esketamine nasal spray versus standard of care for treatment-resistant depression. *J Comp Eff Res.* 2021 02; 0(0): null. doi: 10.2217/cer-2020-0276.

DeSear KE, Thompson-Leduc P, **Kirson N**, Chritton JJ, Ie S, Van Schooneveld TC, Cheung HC, Ou S, Schuetz P. ProCommunity: procalcitonin use in real-world US community hospital settings. *Curr Med Res Opin.* 2020 09; 36(9): 1529-1532. Epub ahead of print 2020/07/10; doi: 10.1080/03007995.2020.1793748.

Desai U, **Kirson NY**, Lu Y, Bruemmer V, Andrews JS. Disease severity at the time of initial cognitive assessment is related to prior health-care resource use burden. *Alzheimer's Dement (Amst).* 2020 12(1): e12093. Epub ahead of print 2020/08/15; doi: 10.1002/dad2.12093.

DeSear KE, Thompson-Leduc P, **Kirson N**, Chritton JJ, Ie S, Van Schooneveld TC, Cheung HC, Ou S, Schuetz P. ProCommunity: procalcitonin use in real-world U.S. community hospital settings. *Current Medical Research and Opinion* 2020 06: 1-1. doi: 10.1080/03007995.2020.1793748.

Cutler D, **Kirson N**, Long G. Financing Drug Innovation in the US: Current Framework and Emerging Challenges. *Pharmacoeconomics* 2020 05: 1-7. Epub ahead of print 2020/05/27. doi: 10.1007/s40273-020-00926-2.

Kirson NY, Meadows ES, Desai U, Smith BP, Cheung HC, Zuckerman P, Matthews BR. Temporal and Geographic Variation in the Incidence of Alzheimer's Disease Diagnosis in the US between 2007 and 2014. *J Am Geriatr Soc.* 2020 Feb;68(2) 346-353. doi: 10.1111/jgs.16262. PubMed PMID: 31797361.

Pavlov V, Thompson-Leduc P, Zimmer L, Wen J, Shea J, Beyhaghi H, Toback S, **Kirson N**, Miller M. Mild traumatic brain injury in the United States: demographics, brain imaging procedures, health-care

utilization and costs. *Brain Inj.* 2019;33(9):1151-1157. doi: 10.1080/02699052.2019. PubMed PMID: 31241427.

Berdugo MA, **Kirson NY**, Zimmer L, Beyhaghi H, Toback S, Scarpati LM, Stone MN, Dember R, Tseng-Tham J, Wen J, Miller M. Economic and clinical benefits of early identification of acute kidney injury using a urinary biomarker. *J Med Econ.* 2019 Dec;22(12):1281-1289. doi: 10.1080/13696998.2019.1636053. PubMed PMID: 31234668.

Andrews JS, Desai U, **Kirson NY**, Zichlin ML, Ball DE, Matthews BR. Disease severity and minimal clinically important differences in clinical outcome assessments for Alzheimer's disease clinical trials. *Alzheimer's Dement (N Y).* 2019 Aug 2;5:354-363. doi: 10.1016/j.trci.2019.06.005. PubMed PMID: 31417957.

Desai U, **Kirson NY**, Ye W, Mehta NR, Wen J, Andrews JS. Trends in health service use and potentially avoidable hospitalizations before Alzheimer's disease diagnosis: A matched, retrospective study of US Medicare beneficiaries. *Alzheimer's Dement (Amst).* 2019 Jan 25;11:125-135. doi: 10.1016/j.dadm.2018.12.005. PubMed PMID: 30788409.

Desai U, **Kirson NY**, Kim J, Khunti K, King S, Trieschman E, Hellstern M, Hunt PR, Mukherjee J. Time to treatment intensification after monotherapy failure and its association with subsequent glycemic control among 93,515 patients with type 2 diabetes. *Diabetes Care.* 2018 Oct;41(10):2096-2104. doi: 10.2337/dc17-0662. PubMed PMID: 30131396.

Reinhart M, Scarpati LM, **Kirson NY**, Patton C, Shak N, Erensen JG. The Economic Burden of Abuse of Prescription Opioids: A Systematic Literature Review from 2012 to 2017. *Appl Health Econ Health Policy.* 2018 Oct;16(5):609-632. doi: 10.1007/s40258-018-0402-x. Review. PubMed PMID: 30027533.

Hey J, Thompson-Leduc P, **Kirson NY**, Zimmer L, Wilkins D, Rice B, Iankova I, Krause A, Schonfeld SA, DeBrase CR, Bozzette S, Schuetz P. Procalcitonin guidance in patients with lower respiratory tract infections: a systematic review and meta-analysis. *Clin Chem Lab Med.* 2018 Jul 26;56(8):1200-1209. doi: 10.1515/cclm-2018-0126. Review. PubMed PMID: 29715176.

Fowler NR, Campbell NL, Pohl GM, Munsie LM, **Kirson NY**, Desai U, Trieschman EJ, Meiselbach MK, Andrews JS, Boustani MA. One-Year Effect of the Medicare Annual Wellness Visit on Detection of Cognitive Impairment: A Cohort Study. *J Am Geriatr Soc.* 2018 May;66(5):969-975. doi: 10.1111/jgs.15330. Epub 2018 Apr 2. PubMed PMID: 29608782.

Dell'Agnello G, Desai U, **Kirson NY**, Wen J, Meiselbach MK, Reed CC, Belger M, Lenox-Smith A, Martinez C, Rasmussen J. Reliability of coded data to identify earliest indications of cognitive decline, cognitive evaluation and Alzheimer's disease diagnosis: a pilot study in England. *BMJ Open.* 2018 Mar 22;8(3):e019684. doi: 10.1136/bmjopen-2017-019684. PubMed PMID: 29567847; PubMed Central PMCID: PMC5875601.

Claxton AJ, Thompson-Leduc P, **Kirson NY**, Rice B, Hey J, Krause A, Iankova I, Schonfeld SA, DeBrase CR, Bozzette S, Schuetz P. Efficacy and Safety of Procalcitonin Guidance in Patients With Suspected or Confirmed Sepsis: A Systematic Review and Meta-Analysis. *Crit Care Med.* 2018 May;46(5):691-698. doi: 10.1097/CCM.0000000000002928. PubMed PMID: 29271844.

Cutler D, Ciarametaro M, Long G, **Kirson N**, Dubois R. Insurance switching and mismatch between the costs and benefits of new technologies. *Am J Manag Care.* 2017 Dec;23(12):750-757. PubMed PMID: 29261241.

Kirson NY, Scott Andrews J, Desai U, King SB, Schonfeld S, Birnbaum HG, Ball DE, Kahle-Wroblewski K. Patient Characteristics and Outcomes Associated with Receiving an Earlier Versus Later Diagnosis of Probable Alzheimer's Disease. *J Alzheimer's Dis.* 2018;61(1):295-307. doi: 10.3233/JAD-170078. PubMed PMID: 29154268; PubMed Central PMCID: PMC5734126.

Scarpati LM, **Kirson NY**, Jia ZB, Wen J, Howard J. Opioid Abuse: A Detailed Examination of Cost Drivers over a 24-Month Follow-up Period. *J Manag Care Spec Pharm.* 2017 Nov;23(11):1110-1115. doi: 10.18553/jmcp.2017.17019. Epub 2017 Jun 6. PubMed PMID: 29083966.

Scarpati LM, **Kirson NY**, Zichlin ML, Jia ZB, Birnbaum HG, Howard JC. Drivers of excess costs of opioid abuse among a commercially insured population. *Am J Manag Care.* 2017 May;23(5):276-282. PubMed PMID: 28738684.

Kirson NY, Scarpati LM, Enloe CJ, Dincer AP, Birnbaum HG, Mayne TJ. The Economic Burden of Opioid Abuse: Updated Findings. *J Manag Care Spec Pharm.* 2017 Apr;23(4):427-445. doi: 10.18553/jmcp.2017.16265. Epub 2016 Dec 30. PubMed PMID: 28345440.

Andrews JS, Desai U, **Kirson NY**, Enloe CJ, Ristovska L, King S, Birnbaum HG, Fleisher AS, Ye W, Kahle-Wroblewski K. Functional limitations and health care resource utilization for individuals with cognitive impairment without dementia: Findings from a United States population-based survey. *Alzheimer's Dement (Amst).* 2016 Dec 9;6:65-74. doi: 10.1016/j.dadm.2016.11.005. eCollection 2017. PubMed PMID: 28229124; PubMed Central PMCID: PMC5312554.

Hadjiyianni I, Desai U, Suzuki S, Ivanova JI, Cao D, **Kirson NY**, Chida D, Enloe C, Birnbaum HG, Perez-Nieves M. Basal Insulin Persistence, Associated Factors, and Outcomes After Treatment Initiation: A Retrospective Database Study Among People with Type 2 Diabetes Mellitus in Japan. *Diabetes Ther.* 2017 Feb;8(1):149-166. doi: 10.1007/s13300-016-0215-6. Epub 2016 Dec 2. PubMed PMID: 27913984; PubMed Central PMCID: PMC5306114.

Kirson NY, Desai U, Ristovska L, Cummings AK, Birnbaum HG, Ye W, Andrews JS, Ball D, Kahle-Wroblewski K. Assessing the economic burden of Alzheimer's disease patients first diagnosed by specialists. *BMC Geriatr.* 2016 Jul 11;16:138. doi: 10.1186/s12877-016-0303-5. PubMed PMID: 27400711; PubMed Central PMCID: PMC4940962.

Happich M, **Kirson NY**, Desai U, King S, Birnbaum HG, Reed C, Belger M, Lenox-Smith A, Price D. Excess Costs Associated with Possible Misdiagnosis of Alzheimer's Disease Among Patients with Vascular Dementia in a UK CPRD Population. *J Alzheimer's Dis.* 2016 May 6;53(1):171-83. doi: 10.3233/JAD-150685. PubMed PMID: 27163798; PubMed Central PMCID: PMC4942727.

Perez-Nieves M, Kabul S, Desai U, Ivanova JI, **Kirson NY**, Cummings AK, Birnbaum HG, Duan R, Cao D, Hadjiyianni I. Basal insulin persistence, associated factors, and outcomes after treatment initiation among people with type 2 diabetes mellitus in the US. *Curr Med Res Opin.* 2016;32(4):669-80. doi: 10.1185/03007995.2015.1135789. Epub 2016 Jan 13. PubMed PMID: 26703951.

Shei A, Rice JB, **Kirson NY**, Bodnar K, Enloe CJ, Birnbaum HG, Holly P, Ben-Joseph R. Characteristics of High-Cost Patients Diagnosed with Opioid Abuse. *J Manag Care Spec Pharm.* 2015 Oct;21(10):902-12. PubMed PMID: 26402390.

Shei A, Hirst M, **Kirson NY**, Enloe CJ, Birnbaum HG, Dunlop WC. Estimating the health care burden of prescription opioid abuse in five European countries. *Clinicoecon Outcomes Res.* 2015 Sep 15;7:477-88.

doi: 10.2147/CEOR.S85213. eCollection 2015. PubMed PMID: 26396536; PubMed Central PMCID: PMC4577260.

Hunter CA, **Kirson NY**, Desai U, Cummings AK, Faries DE, Birnbaum HG. Medical costs of Alzheimer's disease misdiagnosis among US Medicare beneficiaries. *Alzheimer's Dement*. 2015 Aug;11(8):887-95. doi: 10.1016/j.jalz.2015.06.1889. Epub 2015 Jul 21. PubMed PMID: 26206626.

Kirson NY, Shei A, Rice JB, Enloe CJ, Bodnar K, Birnbaum HG, Holly P, Ben-Joseph R. The Burden of Undiagnosed Opioid Abuse Among Commercially Insured Individuals. *Pain Med*. 2015 Jul;16(7):1325-32. doi: 10.1111/pme.12768. Epub 2015 Apr 30. PubMed PMID: 25929289.

Shei A, Rice JB, **Kirson NY**, Bodnar K, Birnbaum HG, Holly P, Ben-Joseph R. Sources of prescription opioids among diagnosed opioid abusers. *Curr Med Res Opin*. 2015 Apr;31(4):779-84. doi: 10.1185/03007995.2015.1016607. Epub 2015 Feb 24. PubMed PMID: 25661018.

Kirson NY, Shei A, Birnbaum HG, Ben-Joseph R, Michna E. Medical resource use and costs among pain patients with potential opioid-tolerability issues. *J Opioid Manag*. 2014 Sep-Oct;10(5):305-10. doi: 10.5055/jom.2014.0220. PubMed PMID: 25350472.

Rice JB, **Kirson NY**, Shei A, Enloe CJ, Cummings AK, Birnbaum HG, Holly P, Ben-Joseph R. The economic burden of diagnosed opioid abuse among commercially insured individuals. *Postgrad Med*. 2014 Jul;126(4):53-8. doi: 10.3810/pgm.2014.07.2783. PubMed PMID: 25141243.

Kirson NY, Shei A, White AG, Birnbaum HG, Ben-Joseph R, Rossiter LF, Michna E. Societal economic benefits associated with an extended-release opioid with abuse-deterrent technology in the United States. *Pain Med*. 2014 Sep;15(9):1450-4. doi: 10.1111/pme.12489. Epub 2014 Jul 8. PubMed PMID: 25041231.

Rice JB, **Kirson NY**, Shei A, Cummings AK, Bodnar K, Birnbaum HG, Ben-Joseph R. Estimating the costs of opioid abuse and dependence from an employer perspective: a retrospective analysis using administrative claims data. *Appl Health Econ Health Policy*. 2014 Aug;12(4):435-46. doi: 10.1007/s40258-014-0102-0. PubMed PMID: 24919646; PubMed Central PMCID: PMC4287687.

Michna E, **Kirson NY**, Shei A, Birnbaum HG, Ben-Joseph R. Use of prescription opioids with abuse-deterrent technology to address opioid abuse. *Curr Med Res Opin*. 2014 Aug;30(8):1589-98. doi: 10.1185/03007995.2014.915803. Epub 2014 Apr 24. PubMed PMID: 24738694.

Rossiter LF, **Kirson NY**, Shei A, White AG, Birnbaum HG, Ben-Joseph R, Michna E. Medical cost savings associated with an extended-release opioid with abuse-deterrent technology in the US. *J Med Econ*. 2014 Apr;17(4):279-87. doi: 10.3111/13696998.2014.897628. Epub 2014 Mar 7. PubMed PMID: 24559196.

Kirson NY, Weiden PJ, Yermakov S, Huang W, Samuelson T, Offord SJ, Greenberg PE, Wong BJ. Efficacy and effectiveness of depot versus oral antipsychotics in schizophrenia: synthesizing results across different research designs. *J Clin Psychiatry*. 2013 Jun;74(6):568-75. doi: 10.4088/JCP.12r08167. Epub 2013 Apr 19. Review. PubMed PMID: 23842008.

Geldmacher DS, **Kirson NY**, Birnbaum HG, Eapen S, Kantor E, Cummings AK, Joish VN. Pre-diagnosis excess acute care costs in Alzheimer's patients among a US Medicaid population. *Appl Health Econ Health Policy*. 2013 Aug;11(4):407-13. doi: 10.1007/s40258-013-0038-9. PubMed PMID: 23700254.

Geldmacher DS, **Kirson NY**, Birnbaum HG, Eapen S, Kantor E, Cummings AK, Joish VN. Implications of early treatment among Medicaid patients with Alzheimer's disease. *Alzheimer's Dement*. 2014 Mar;10(2):214-24. doi: 10.1016/j.jalz.2013.01.015. Epub 2013 May 2. PubMed PMID: 23643457.

Kirson NY, Rao S, Birnbaum HG, Kantor E, Wei RS, Cifaldi M. Matching-adjusted indirect comparison of adalimumab vs etanercept and infliximab for the treatment of psoriatic arthritis. *J Med Econ*. 2013;16(4):479-89. doi: 10.3111/13696998.2013.768530. Epub 2013 Feb 7. PubMed PMID: 23339434.

Grabowski HG, Kyle M, Mortimer R, Long G, **Kirson N**. Evolving brand-name and generic drug competition may warrant a revision of the Hatch-Waxman Act. *Health Aff (Millwood)*. 2011 Nov;30(11):2157-66. doi: 10.1377/hlthaff.2010.0270. PubMed PMID: 22068409.

Kirson NY, White AG, Birnbaum HG, Schiller M, Waldman T, Peterson K, Ben-Joseph RH, Berner T, Summers KH. Direct and indirect costs of patients treated with extended-release oxymorphone HCl or controlled-release oxycodone HCl. *J Med Econ*. 2012;15(1):87-95. doi: 10.3111/13696998.2011.629261. Epub 2011 Oct 28. PubMed PMID: 22032675.

Kirson NY, Birnbaum HG, Ivanova JI, Waldman T, Joish V, Williamson T. Excess costs associated with patients with chronic thromboembolic pulmonary hypertension in a US privately insured population. *Appl Health Econ Health Policy*. 2011 Nov 1;9(6):377-87. doi: 10.2165/11592440-000000000-00000. PubMed PMID: 21888449.

Kirson NY, Birnbaum HG, Ivanova JI, Waldman T, Joish V, Williamson T. Excess costs associated with patients with pulmonary arterial hypertension in a US privately insured population. *Appl Health Econ Health Policy*. 2011 Sep 1;9(5):293-303. doi: 10.2165/11592430-000000000-00000. PubMed PMID: 21875160.

Kirson NY, Birnbaum HG, Ivanova JI, Waldman T, Joish V, Williamson T. Prevalence of pulmonary arterial hypertension and chronic thromboembolic pulmonary hypertension in the United States. *Curr Med Res Opin*. 2011 Sep;27(9):1763-8. doi: 10.1185/03007995.2011.604310. Epub 2011 Jul 27. PubMed PMID: 21793646.

Kirson NY, Ivanova JI, Birnbaum HG, Wei R, Kantor E, Amy Puenpatom R, Ben-Joseph RH, Summers KH. Descriptive analysis of Medicaid patients with postherpetic neuralgia treated with lidocaine patch 5%. *J Med Econ*. 2010;13(3):472-81. doi: 10.3111/13696998.2010.499819. PubMed PMID: 20684670.

Kirson NY, Ivanova JI, Birnbaum HG, Wei R, Kantor E, Puenpatom RA, Ben-Joseph RH, Summers KH. Comparing healthcare costs of Medicaid patients with postherpetic neuralgia (PHN) treated with lidocaine patch 5% versus gabapentin or pregabalin. *J Med Econ*. 2010;13(3):482-91. doi: 10.3111/13696998.2010.506176. PubMed PMID: 20684669.

SELECTED CONFERENCE PRESENTATIONS

“Pathways to Innovation in Healthcare: Finding the Right Partners at the Right Time,” panel moderator, MIT Sloan Healthcare and BioInnovations Conference, Cambridge, MA (2018)

“Providers, Payers and Policy Makers Digitizing Population Health Management,” panel moderator, MIT Sloan Healthcare and BioInnovations Conference, Cambridge, MA (2017)

“Time to Treatment Intensification and its Association with Subsequent Macrovascular Outcomes among Patients with Type 2 Diabetes,” with J Kim, U Desai, S King, E Trieschman, M Hellstern, P Hunt, and J Mukherjee, platform presentation, 52nd Annual Meeting, European Association for the Study of Diabetes (EASD), Munich (2016)

“Are Alternative Financing Approaches Needed for Innovative Therapies?” issue panel moderator, ISPOR 21st Annual International Meeting, Washington, DC (2016)

“The Use of ICD-9-CM Diagnosis Codes for Opioid Abuse and Opioid Dependence in Commercial Claims Data,” with A Shei, JB Rice, K Bodnar, AKG Cummings, HG Birnbaum, P Holly, and R Ben-Joseph, platinum medal and platform presentation, Academy of Managed Care Pharmacy Nexus, Boston (2014)

“The Burden of Opioid Abuse among Commercially Insured Patients,” with JB Rice, A Shei, CJ Enloe, AKG Cummings, HG Birnbaum, and R Ben-Joseph, best poster award, ISPOR 19th Annual International Meeting, Montreal (2014)

“Assessing the economic burden of Alzheimer’s disease patients treated by specialists on the date of preliminary diagnosis of cognitive decline,” with U Desai, L Ristovska, AKG Cummings, HG Birnbaum, K Kahle-Wroblewski, W Ye, JS Andrews, and CA Hunter, platform presentation, Alzheimer’s Association International Conference, Copenhagen (2014)

“Excess Costs Associated with Misdiagnosis of Alzheimer’s Disease among US Medicare Beneficiaries with Vascular Dementia or Parkinson’s Disease,” with CA Hunter, U Desai, AKG Cummings, AM San Roman, DE Faries, C Hardwick, and HG Birnbaum, platform presentation, Alzheimer’s Association International Conference, Boston (2013)

See video of presentation at: <https://www.youtube.com/watch?v=UOmjrCnkqY>

See coverage by CNN.com at: <http://www.cnn.com/2013/07/18/health/alzheimers-warning-signs/>

“The Impact of Study Design in Comparative Effectiveness Research in Schizophrenia,” with BJ Wong, S Yermakov, W Huang, T Samuelson, S Offord, and PE Greenberg, best poster award, 52nd New Clinical Drug Evaluation Unit (NCDEU) Annual Meeting, Phoenix (2012)

“Cost Implications of Early Treatment among Patients with Alzheimer’s Disease – a Medicaid Perspective,” with DS Geldmacher, HG Birnbaum, S Eapen, AKG Cummings, and VN Joish, platform presentation, 64th Annual Meeting of the American Academy of Neurology, New Orleans (2012)

“Pre-Diagnosis Excess Acute Care Costs in Alzheimer’s Patients among a U.S. Medicaid Population,” with DS Geldmacher, HG Birnbaum, E Kantor, S Eapen, VN Joish, platform presentation, Alzheimer’s Association International Conference, Paris (2011)

“Pulmonary Arterial Hypertension Cost of Illness in the U.S. Privately-Insured Population,” with HG Birnbaum, JI Ivanova, M Schiller, T Waldman, T Williamson, best poster award, ISPOR 12th Annual European Congress, Paris (2009)

SELECTED LITIGATION AND STRATEGY CASE WORK

- **Launch pricing for novel therapy in pediatric rare disease**
Conducted research on behalf of a biopharmaceutical manufacturer to inform US launch pricing of a new treatment for a rare pediatric illness. Oversaw research with payers and physicians, formulation of pricing recommendations, and presentation to senior leadership.

- **ICER review of novel gene therapy**
Supported a pharmaceutical manufacturer facing review of a novel gene therapy by the Institute for Clinical and Economic Review (ICER). Assisted in responding to scoping documents, model development plan, and draft report. Developed an independent model to evaluate ICER's findings and provide feedback.
- ***Association of Community Cancer Centers, et al. v. Azar, et al.***
US District Court, District of Maryland
Supported expert declaration on behalf of plaintiffs regarding the economic impacts of the Most Favored Nation (MFN) Rule for prescription drug pricing introduced by the US Department of Health and Human Services. Plaintiffs secured a temporary restraining order to block the Rule.
- ***Merck & Co. Inc., et al. v. US Department of Health and Human Services, et al.***
US District Court, District of Columbia; US Court of Appeals for the District of Columbia Circuit
Supported plaintiffs – three major pharmaceutical companies and the Association of National Advertisers – in blocking Department of Health and Human Services rule requiring disclosure of wholesale drug prices in direct-to-consumer advertising. Supported two expert declarations on the relevance of wholesale prices to consumers and risk of confusion.
- ***Federal Trade Commission v. AbbVie Inc., et al.***
US District Court, Eastern District of Pennsylvania
Supported defendants' economic expert in filing expert reports, deposition testimony, and trial testimony, on issues of market definition and damages related to an alleged sham patent litigation for AndroGel, a topical testosterone replacement therapy.
- **Evaluation of employer-PBM contracting**
On behalf of a major pharmaceutical manufacturer, evaluated landscape trends and potential new market disruption in employer-PBM contracting through a series of in-depth interviews with employers and benefits consultants.
- **Outcomes-based contracting design**
On behalf of a device manufacturer, evaluated potential outcomes-based contracting arrangements to allow the manufacturer to engage in risk sharing with clients and potentially capitalize on cost savings realized from its products.
- **Evaluation of benchmarking methodology for medical claims**
On behalf of a large insurer, reviewed proposed change in benchmarking methodology to determine value for different medical services associated with certain casualty claims. Assessed potential implications for payments made to providers.
- ***United States of America, et al. v. Anthem Inc., et al.***
US District Court, District of Columbia
Supported the US Department of Justice in challenging the proposed Anthem-Cigna merger, including analyses of claims data and evaluation of provider costs. Assisted in the preparation of expert reports and in preparation for deposition and trial.
- ***United States of America v. American Express Company***
US District Court, Eastern District of New York
Supported the US Department of Justice in conducting analyses to assess economic implications of American Express's use of merchant restraints. Assisted in the preparation of expert reports and in preparation for deposition and trial.

- **Government investigations concerning prescription drug marketing practices, including the following:**

- NovoSeven/Novo Nordisk (District of Maryland)
- Remodulin, Tyvaso/United Therapeutics (District of Maryland)

Evaluated alleged conduct, quantified relevant sales, and assessed the causal connection, if any, between allegations in the case and sales at issue.

- ***Drug Mart Pharmacy Corp., et al. v. American Home Products Corp., et al.***

US District Court, Eastern District of New York

Supported defendants, five manufacturers of brand-name prescription drugs, in Robinson-Patman Act claims asserted by 28 individually owned retail pharmacies. Assisted counsel in preparation of motion for summary judgment, including analysis of potential lost customers.

- ***Novell, Inc., v. Microsoft Corp.***

US District Court, District of Utah

Supported damages rebuttal expert in drafting of expert report, preparation for deposition, and preparation for testimony at trial. Assisted counsel in preparing for the testimony of opposing witnesses and experts, both at deposition and at trial.

- **Steward Health Care Hospital acquisition**

Assisted in preparation of white paper analyzing potential anticompetitive concerns in the proposed acquisition of hospitals by the Steward Health Care network.

- ***United States of America, ex. rel. John Underwood v. Genentech, Inc.***

US District Court, Eastern District of Pennsylvania

Supported economic expert in analyzing impact of alleged off-label promotion and payment of kickbacks with respect to Rituxan.

- ***Jim Hood, Attorney General ex rel. State of Mississippi v. Microsoft Corporation***

Chancery Court of Hinds County, Mississippi

Supported primary damages rebuttal expert in drafting of expert report and preparation for deposition. Assisted in developing multiple critiques and rebuttals of opposing experts' causation and damages methodologies and price overcharge calculations.

- **National Football League local revenue index**

Worked with the NFL's Club Business Development group to assess key drivers of local team revenues across a variety of revenue channels, such as ticketing, sponsorship, and local TV/radio. Used statistical models to identify the contribution of different factors to each of the revenue streams, and to project revenues adjusting for factors outside teams' control.

- **Miami Dolphins ticket pricing**

Assisted the Miami Dolphins in improving 2010 season ticket and individual game ticket prices, resulting in increased attendance and revenue.

NON-ACADEMIC PUBLICATIONS

Kirson N, Desai U, Fowler, N. "We need to improve Medicare's annual wellness visit to better detect early dementia." *STAT* (July 20, 2018) <https://www.statnews.com/2018/07/20/detect-dementia-medicare-annual-wellness-visit/>

Ciarametaro M, Long G, Johnson M, **Kirson N**, Dubois R. “Are Payers Ready To Address The Financial Challenges Associated With Gene Therapy?” *Health Affairs Blog* (June 28, 2018)

Kirson N. “Consider Value vs. Budget Impact In Massachusetts Drug Prices.” *Law360* (September 29, 2017) <https://www.law360.com/articles/967163/consider-value-vs-budget-impact-in-mass-drug-prices>

FELLOWSHIPS

- 2007–2008 NBER Pre-Doctoral Fellowship in Aging and Health Economics
- 2007–2008 Harvard/Robert Wood Johnson Research Grant, Harvard School of Public Health (joint with Professor David M. Cutler)
- 2006–2007 National Science Foundation Dissertation Fellowship in Inequality and Social Policy, Harvard Kennedy School
- 2004–2008 Doctoral Fellow, Multidisciplinary Program in Inequality and Social Policy, Harvard Kennedy School

TEACHING EXPERIENCE

- 2007 Teaching Fellow, Political Economics Junior Seminar, Harvard University
- 2005–2007 Teaching Fellow, Social Analysis 10, Harvard University
2007 Allyn Young Award for Excellence in Teaching
2006 and 2007 Harvard University Certificate of Distinction in Teaching
- 2004–2007 Economics Instructor, MPA Mid-Career Summer Program, Harvard Kennedy School
- 2002–2003 Teaching Assistant, Price Theory, Hebrew University Economics Department
- 2002–2003 Teaching Assistant, Integrative Introduction, PPE program, Hebrew University
- 2001–2002 Teaching Assistant, Introductory Microeconomics and Macroeconomics, Hebrew University Economics Department