UNIVERSITY *of* WASHINGTON

THE CHOICE INSTITUTE

School of Pharmacy

ANNUAL REPORT 2023

THE COMPARATIVE HEALTH OUTCOMES, POLICY & ECONOMICS INSTITUTE

TABLE OF CONTENTS

OUR MISSION

Research: Develop innovative methods and generate actionable evidence about the effectiveness, safety, and value of medical products and services that improve decision making in health care and policy.

Training: Provide transformative training in health economics, outcomes research, and policy analysis to meet contemporary health care challenges regionally, nationally, and globally.

Service: Be a leading resource on the effectiveness, safety, and value of medical products and services by providing expertise and facilitating collaborations at the regional, national, and global level.

CHOICE STATEMENT ON DIVERSITY, EQUITY, AND INCLUSION

CHOICE is committed to creating an inclusive academic community where every individual is treated fairly and with dignity and respect. We strongly believe that diversity enriches learning, broadens the perspectives of all in our program, and improves our sense of community. Diversity requires an atmosphere of inclusion, tolerance, respect, and equity.

Our equality and diversity principles:

- We value the tremendous diversity of the human experience and believe that this diversity strengthens our communities and our program.
- We believe that discrimination or exclusion based on individual characteristics and circumstances, such as age; disability; caring or dependency responsibilities; gender or gender identity; marriage and civil partnership status; political opinion; pregnancy and maternity; race, color, caste, nationality, ethnic or national origin; religion or belief; sexual orientation; socio-economic status; or other distinctions, is unjust and represents a waste of talent and a denial of opportunity for self-fulfillment.
- We recognize that patterns of under-representation and differences in outcomes at CHOICE can be challenged through positive action.
- We respect the rights of individuals, including the right to hold their own opinions and beliefs, but will not allow these opinions to be manifested in a way that is hostile or degrading to others.
- We expect commitment and involvement from all our faculty, staff, and students in working towards the achievement of our vision.

CHOICE FACULTY & STAFF

Core Faculty

Jennifer Bacci, MPH, PharmD
Associate Professor, Endowed Professor in Innovative Pharmacy Practice (I2P2)

Aasthaa Bansal, PhD
Associate Professor

Douglas Barthold, PhD
Research Assistant Professor, CHOICE Endowed Faculty Fellow

Anirban Basu, PhD
Stergachis Family Endowed Director & Professor

Josh Carlson, MPH, PhD
Professor, Director, Graduate Program

Beth Devine, PharmD, MBA, PhD
Professor Emeritus

Clayton English, PharmD
Assistant Professor

Louis Garrison, Jr., PhD
Professor Emeritus

Shelly Gray, PharmD, MS
Plein Endowed Professor for the Director of the Center for Geriatric Pharmacy, Research, Education and Outreach

Ryan Hansen, PharmD, PhD
Associate Professor, Interim Chair, Department of Pharmacy

Thomas Hazlet, DrPH, PharmD
Associate Professor Emeritus

Kyueun Lee, PhD
Assistant Professor

Jing Li, MA, PhD
Assistant Professor

Andy Stergachis, PhD
Professor, Associate Dean for Research, Graduate Education & New Initiatives

Sean D. Sullivan, BScPharm, MSc, PhD
Professor

David Veenstra, PharmD, PhD
Professor

Adjunct Faculty

David Au, MS, MD
Adjunct Professor

Brian Bresnahan, PhD
Adjunct Research Associate Professor

Todd Edwards, PhD
Adjunct Professor

David Flum, MD, MPH
Adjunct Professor

Lurdes Inoue, MS, MS, PhD
Adjunct Professor

Jerry Jarvik, MD, MPH
Adjunct Professor

Larry Kessler, ScD
Adjunct Professor

Gary Lyman, MD, MPH
Adjunct Professor

Scott Ramsey, MD, PhD
Adjunct Professor, Co-Director, Hutchinson Institute for Cancer Outcomes Research and Evaluation

Staff

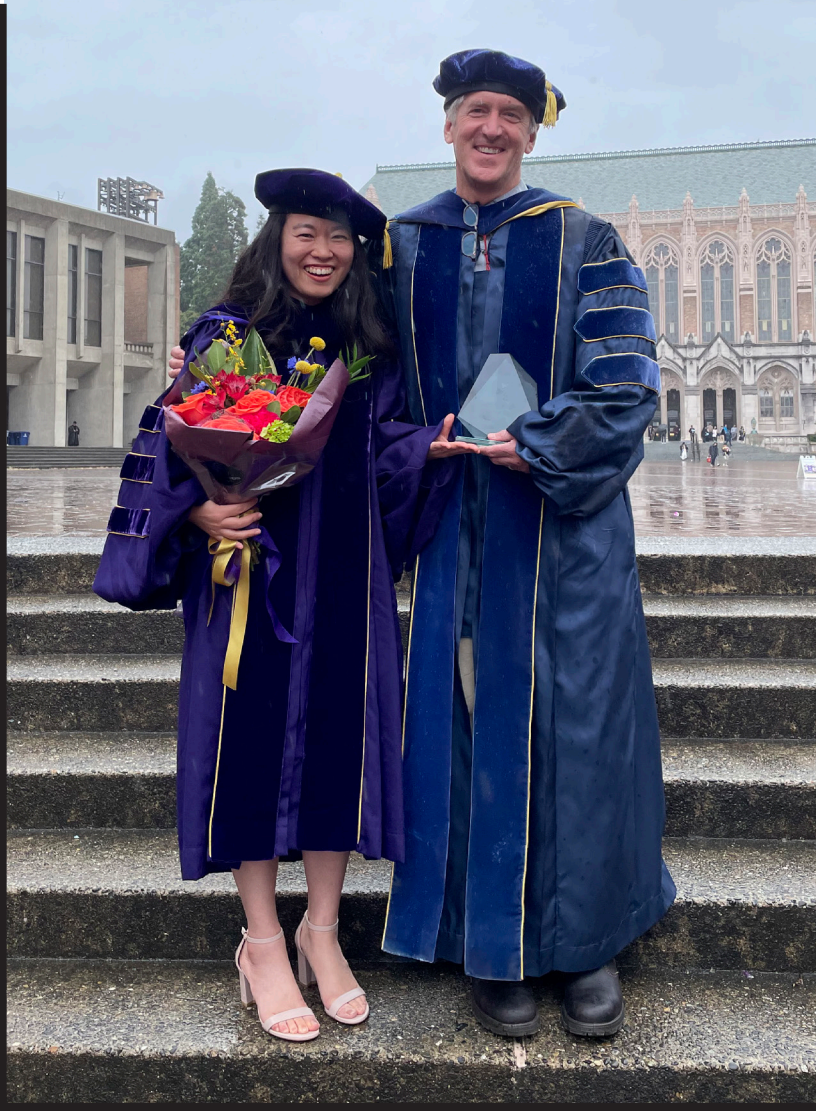
Leana de la Torre
Online Certificate Program Manager

Marina Gano, M.Ed.
Graduate Program & Operations Manager

Greg Guzauskas, MSPH, PhD
Senior Research Scientist

Linda Luu, MS
Biostatistician

OPPOSITE TOP PHOTOS: OUR 2022 AND 2023 GRADUATES AT THE SCHOOL OF PHARMACY GRADUATE RECOGNITION CEREMONY IN JUNE; BOTTOM PHOTO: CHOICE FACULTY, STAFF, AND STUDENTS AT THE 2023 ANNUAL RETREAT.



DIRECTOR'S WELCOME

Dear Friends and Colleagues,

The 2022–2023 Annual Report for the CHOICE Institute at the UW School of Pharmacy exemplifies our commitment to Teaching, Service, and Research in Health Economics and Outcomes Research. Our courses and seminars have reverted to being in-person, and the human connections have invigorated our commitment to work. At the same time, the impact of our work keeps magnifying, as the historic Inflation Reduction Act allowed CMS to start negotiating prices for selected drugs, and the White House guideline on the evaluation of regulations included an allowance for doing cost-effectiveness analysis in specific instances. Several publications by CHOICE faculty have shed light on the nuances of these historic policies and provided necessary guidance on these policies.

Prof. Lou Garrison received the well-deserved Lifetime Achievement award from ISPOR. Lou has been a beacon of professionalism and HEOR expertise for decades and shows no signs of slowing down. Former Dean and CHOICE Professor Sean Sullivan was elected as a fellow of the American Association for the Advancement of Science. Prof. Beth Devine transitioned into an Emeritus faculty role with us in July. Like Lou, we know Beth will continue to be engaged with all aspects of the CHOICE program. Prof. Dave Veenstra received the 2023 School of Pharmacy Outstanding Graduate Mentor Award. Congratulations to all our CHOICE leaders. Last year, we welcomed our new faculty, Assistant Professors Jing Li and Kyu Eun Lee. We are so excited to have them both as our colleagues. Dr. Li and Prof. Doug Barthold have also assumed the roles of Co-Directors for the Program in Health Economics and Outcomes Methodology (PHEnOM). This summer, we welcome Assistant Professor Clayton English, a pharmacist specializing in behavioral health sciences and psychiatric pharmacy practice. We are also grateful to Prof. Ryan Hansen for his leadership and for stepping in as the Interim Chair for the Department of Pharmacy. Last but not least, we have a new Dean for the School of Pharmacy! We look forward to warmly welcoming Dr. Jay Panyam as he and his family transition to the PNW.

Last year, we hosted our Annual Symposium focused on topics in health equity. Since its inception, our Institute has identified principles of diversity, inclusiveness, and respect as some of its core principles and has invoked them in almost every decision. One key aspect of building on and sustaining these principles is a clear notion about equity and equality of opportunities for all. As we learn to practice these principles, we have also started to incorporate these discussions in our training and research on topics that, traditionally, have not considered these issues as the primary objectives. Our symposium was a testament to us all learning to bridge these gaps. We are grateful that we have had three world-renowned speakers, each telling us how to approach, measure, and incorporate principles of health equity in our research. We were also thrilled to host and support the SMDM Annual Meeting in our city last Fall, focusing on advancing equity in medical decision-making. Prof. Aasthaa Bansal was the Scientific Co-chair for the meeting, and our affiliate Faculty Davene Wright was the Co-chair.

A round of kudos applies to many of our students and alums. PhD student Sara Khor was honored with the School of Pharmacy Graduate Student Leadership Award. In March, PhD student Karris Jeon won the best podium presentation award at the Western Pharmacoeconomics Conference. In the same meeting, PhD students Emily Callen and Ben Nwogu won the best poster presentation awards. Our alumni Lisa Bloudek received the 2022 Value in Health Paper of the Year Award, with UW faculty co-authors Sean Sullivan and Jens Grueger. PhD student Joyce Jiang led the interdisciplinary Team GenePedia and won the $2,500 Kent & Lisa Sacia Best Idea in Digital Health Prize in the 8th annual Hollomon Health Innovation Challenge (HIC) hosted by the UW Foster School's Buerk Center for Entrepreneurship. Recent PhD program alum, Boshen Jiao won one of the Milt Weinstein Awards for Outstanding Presentation in Applied Health Economics at the SMDM meeting. In other work, our senior staff scientist, Greg Guzauskas, led and published an important article on the value of routine genomic screening for young adults. This paper was selected as one of the top ten most significant advances of the year in genomics by The Genomic Medicine Working Group of the National Advisory Council for Human Genome Research of the National Human Genome Research Institute (NHGRI).

We welcome our new Online Certificate Program Manager, Leana de la Torre, and a new staff scientist, Linda Luu. We are grateful for the services of our Research Project Manager, Ms. Perchita Bhan, who departed our team in August. We also welcome our new cohort of MS fellows joining us this July and the new cohort of PhD students entering in September. Finally, congrats to our graduating PhD students: Yilin Chen, Samantha Clark, and Sabra Zaraa, and graduating MS students: Zach Baldwin, Spencer Cheng, Arvind Katta, Hyunwoo Kim, Jae Kim, and Stella Ko.

Last, but certainly not least, I am thankful to the entire Department of Pharmacy staff, especially Marina Gano, for their wide-ranging contribution to the Institute's administration and keeping the engine running. I am also thankful to all our colleagues in the HEOR field who have supported us through myriad channels.

I wish you all a healthy 2023–2024 year ahead.

Sincerely,

Anirban Basu
Stergachis Family Endowed Director and Professor
The CHOICE Institute

CLASS OF 2023

DOCTOR OF PHILOSOPHY (HEALTH ECONOMICS & OUTCOMES RESEARCH)

Yilin Chen

MPH Global Health 2018, University of Washington; BS, Global Health, Wuhan University, China

DISSERTATION: *Evaluating Heterogeneity in Treatment Effects and Economic Value of Tumor-Agnostic Drugs*

CHAIR: Josh Carlson

CURRENT POSITION: Senior Research Associate, Curta, Seattle, WA

Sabra Zaraa

MPH 2018, University of Washington; PharmD 2015, University of Monastir

Dissertation: *Health and economic burden of substandard and falsified medicines*

CHAIR: Andy Stergachis

CURRENT POSITION: On the job market

Samantha Clark

MS 2013, Johns Hopkins Bloomberg School of Public Health; BA 2008, St. Mary's College of Maryland

DISSERTATION: *Investigating the effect of Gleevec list price on adherence and outcomes in Medicare patients with chronic myeloid leukemia*

CHAIR: Anirban Basu

CURRENT POSITION: Senior Associate at Medicus Economics, Boston, MA

MASTER OF SCIENCE (HEALTH ECONOMICS & OUTCOMES RESEARCH)

Zach Baldwin

PharmD 2022 and BS 2017, University of Washington

THESIS: *Impact of Device-Aided Therapy Initiation on Oral Medication Treatment Patterns in People with Parkinson's Disease: A Retrospective Cohort Analysis*

CHAIR: Beth Devine

CURRENT POSITION: Industry Fellowship Year 2; AbbVie

Spencer Cheng

PharmD 2022, University of Washington; BS 2016, University of California, Davis

THESIS: *Productivity Loss by cancer stage in patients newly-diagnosed with hepatocellular carcinoma*

CO-CHAIRS: Dave Veenstra and Aasthaa Bansal

CURRENT POSITION: Industry Fellowship Year 2; Genentech

Arvind Katta

PharmD 2022, BS 2021, Northeastern University

THESIS: *Treatment Patterns of Patients Atrial Fibrillation (AF) Patients Who Have Bled on Direct-Acting Oral Anticoagulants (DOACs)*

CHAIR: Ryan Hansen

CURRENT POSITION: Industry Fellowship Year 2; Bayer

Hyunwoo Kim

PharmD 2022, BS 2020, University of Pittsburgh

THESIS: *Understanding the diagnosing providers for commercially-insured patients with Huntington Disease and their association with treatment preferences and costs using retrospective claims data*

CHAIR: Ryan Hansen

CURRENT POSITION: Industry Fellowship Year 2; Neurocrine Biosciences

Jae Rok Kim

PharmD 2022, University of Michigan; BA 2017, University of California Berkeley

Thesis: *Healthcare Resource Utilization and Costs Associated with Misdiagnosis of Migraine*

CHAIR: Beth Devine

CURRENT POSITION: Industry Fellowship Year 2; AbbVie

Stella Youngeun Ko

PharmD 2022, University of North Carolina Chapel Hill; BS 2017, University of California Los Angeles

THESIS: *Productivity loss among commercially insured non-elderly patients with diabetic macular edema in two eyes: a retrospective claims analysis in the United States*

CO-CHAIRS: Dave Veenstra and Aasthaa Bansal

CURRENT POSITION: Industry Fellowship Year 2; Genentech

WELCOME: NEW STUDENTS AND FELLOWS

PHD STUDENTS

Hui-Hsuan Chan

MHS, Health Economics and Outcomes Research, Johns Hopkins University; BS, Pharmacy, Taipei Medical University

Hui-Hsuan joins us from the Bloomberg School of Public Health at Johns Hopkins University, where she received her MHS in HEOR. She also obtained a BS in Pharmacy from Taipei Medical University. Before joining UW, she worked as a consultant at APPERTURE Health in New Jersey, focusing on various modeling, pricing, and market access projects. She also worked for Bayer, contributing to pharmaceutical sales and marketing efforts. Her primary research interests encompass a range of areas, including innovative cost-effectiveness analyses in cancer, value assessments of health technologies, and health economics.

Manpreet Dhankar

MS, University of Michigan Ann Arbor; BS, Economics-Statistics, University of Pittsburgh

Manpreet recently graduated with an MS in Biostatistics from the University of Michigan School of Public Health where she conducted research in Bayesian methods to examine the issue of patient preference in randomized controlled trials and modeled human-fomite contact structures in the transmission of viral illnesses. Earlier in her career, Manpreet worked in behavioral economics at the Pittsburgh Experimental Economics Laboratory, designing and analyzing data from online studies. She is excited to join the CHOICE Institute and further develop her skills in HEOR. Currently, she is interested in unraveling the intricate relationships between health technologies, patient outcomes, and resource allocation in the context of precision medicine.

Zilin Cheng

MS, Health Policy and Economics, Cornell University; BA, Financial Management, Dalian University of Technology

Zilin graduated from the Health Policy and Economics program at Cornell University, Weill Cornell Medicine (WCM). Prior to UW, she worked at WCM, where her work involved research in causal inference and evaluating clinical decision support tools. Zilin's research interests include economic evaluations, causal inference, and understanding individuals' decision-making processes related to health issues. She is excited to join The CHOICE Institute, where she looks forward to acquiring valuable hands-on experience and honing advanced research and technical skills under the guidance of CHOICE faculty.

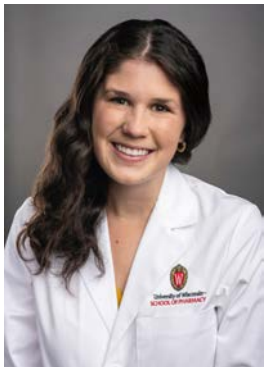
Carlos Pineda Antunez

MS, Health Economics, National Institute of Public Health Mexico; BENGR, National Polytechnic Institute

Carlos has worked as a health decision modeler at the Health Research Consortium in Mexico. He holds a BS in Biomedical Engineering and a master's degree in health economics. He collaborated on the Global Health Cost Consortium project, which focuses on providing cost-related information to enhance the efficiency of HIV and TB interventions. Recently, he has been developing natural history individual-based cancer models and utilizing Bayesian calibration techniques with neural networks. He is interested in integrating decision sciences, health economics, and data sciences to generate valuable insights for improving health decision models. He is happy to join the CHOICE Institute and collaborate with the great faculty and students.

MS FELLOWS

Emma Behan, Genentech



PharmD, BS, Pharmaceutical Sciences, University of Wisconsin-Madison

Emma is a recent graduate from the University of Wisconsin School of Pharmacy. She developed an interest in real world evidence after seeing the utility while interning at a healthcare performance consulting firm and completing a health economics outcomes research rotation at the University of Utah. Her research interests include real world evidence, economic modeling, and strategy. Emma looks forward to learning from the distinguished experts at CHOICE and Genentech.

Jake Earl, Bayer

PharmD, University of Utah

Jake received his PharmD from the University of Utah. He pursued his interest in HEOR by seeking out opportunities in research and experiences within the pharmaceutical industry. His research experience includes extra-curricular collaboration with faculty at the University of Utah's Pharmacy Outcomes Research Center (PORC), where he contributed to publications performing cost-effectiveness and umbrella analyses. He obtained pharmaceutical industry experience through rotations at Xcenda and Ionis Pharmaceuticals. Jake looks forward to gaining specialized instruction in modeling, data analysis, and evidence generation from HEOR-leading experts at the UW CHOICE Institute and plans to apply his education to make notable contributions to the field at Bayer.

Jennifer Dezet Deem, Seagen

PhD, Pharmacology, University of Washington; BS, Biochemistry & Chemistry, University of Washington

Jennifer joins CHOICE with a BS in Chemistry and Biochemistry, and a PhD in Pharmacology, all earned at the University of Washington. As prior junior faculty at the UW, Jennifer's research program focused on understanding the neurocircuits underlying thermoregulatory impact on food intake and glycemic control. As Jennifer's research goals required greater data science understanding, she was drawn to clinical research studies and longed to be involved in more immediately impactful research. She is thrilled to be working with Seagen and the UW CHOICE faculty to build applicable advanced understanding of HEOR.

Filmon Haile, AbbVie

PharmD, University of Southern California; BS, Biology, University of California, Los Angeles

Filmon recently graduated from University of Southern California with his PharmD. He has industry experience in medical and regulatory affairs, though he found his passion for HEOR through elective courses at his university and side projects that he took on throughout his rotations. Filmon is stimulated by thought-provoking conversation, and he is passionate about filling in unmet gaps in our health care system. He is really looking forward to gaining technical experience and working closely with the renowned faculty at CHOICE Institute and industry experts at AbbVie.

Alexandra Miller, Genentech

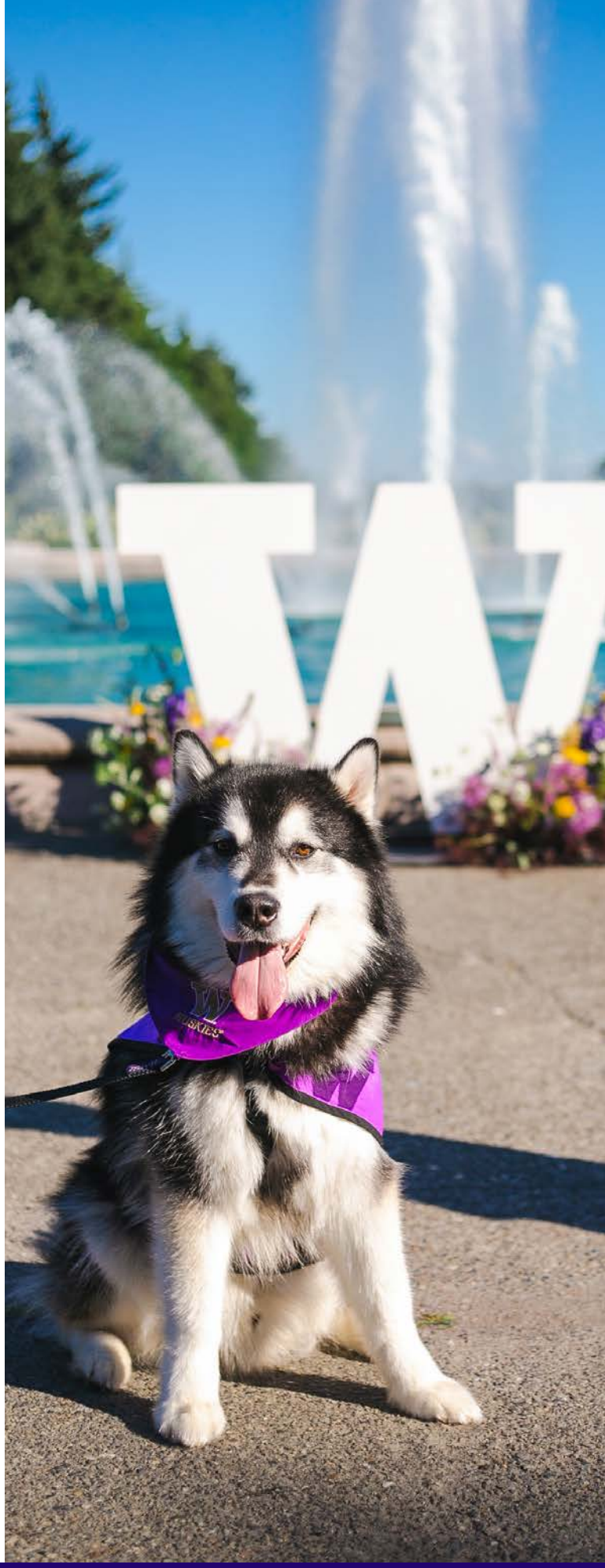
PharmD, MPH, University of Texas at Austin; MPH BA, Chemistry, Wake Forest University

Alexandra is a recent PharmD/MPH graduate. She developed an interest in health economics and outcomes research while working on Dr. Leticia Moczygemba's research team throughout her time in pharmacy school at the University of Texas. Her research focused on the value of an ongoing mobile health intervention for the homeless population in Austin with its impact on healthcare utilization trends and patient-reported outcomes. Her research interests include real-world evidence, patient-reported outcomes, and value-based care. During this fellowship, Alexandra is excited about the opportunity to expand her HEOR skills and learn from HEOR experts at the CHOICE Institute and Genentech.

Richard Ta, AbbVie

PharmD, University of Southern California; BS, Microbiology, University of California, Davis

Richard earned his PharmD from the University of Southern California (USC) Alfred E. Mann School of Pharmacy. His interest in HEOR developed through opportunities such as the AMCP P&T competition and an internship at Janssen Pharmaceuticals. From these experiences, he learned the importance of HEOR's role in demonstrating the value story of a product to maximize patient access. His current research interests are economic modeling, real-world evidence generation, and patient-reported outcomes. Richard is excited to embark on a new chapter in his career, working with CHOICE and AbbVie to expand his HEOR skillsets and improve patient access to treatment.



CURRENT STUDENTS AND FELLOWS

PHD STUDENTS

Shiven Bhardwaj, PharmD, MAS

PhD Student (Year 2)

DISSERTATION TOPIC: TBD

ADVISOR: Doug Barthold

Tori Dayer, PharmD

PhD Student (Year 3)

DISSERTATION TOPIC: TBD

ADVISOR: Sean Sullivan

Emily Callen, MPH

PhD Student (Year 2)

DISSERTATION TOPIC: TBD

ADVISOR: Dave Veenstra

Ronald Dickerson, MPH, MA

PhD Student (Year 3)

DISSERTATION TOPIC: TBD

ADVISOR: Dave Veenstra

Emma Cousin, PharmD

PhD Student (Year 2)

DISSERTATION TOPIC: TBD

ADVISOR: Sean Sullivan

Zizi Elsisi, MS, BPharm

PhD Student (Year 4)

DISSERTATION TOPIC: TBD

ADVISOR: Anirban Basu

Julia Fox, MA

PhD Student (Year 2)

DISSERTATION TOPIC: TBD

ADVISOR: Jing Li

Sara Khor, MASc

PhD Student (Year 5)

DISSERTATION TOPIC: *Incorporating Equity into Healthcare Decision Making Around New Technologies*

ADVISORS: Aasthaa Bansal & Josh Carlson

Karris Jeon, MS

PhD Student (Year 2)

DISSERTATION TOPIC: TBD

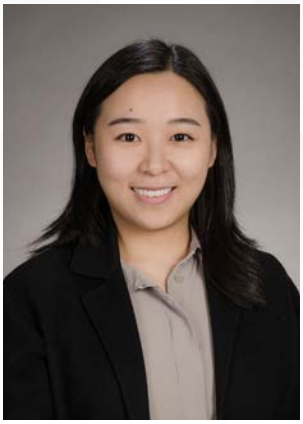
ADVISOR: Josh Carlson

Felipe Montaño-Campos

PhD Student (Year 3)

DISSERTATION TOPIC: TBD

ADVISOR: Anirban Basu



Shangqing Joyce Jiang, MPH

PhD Student (Year 5)

DISSERTATION TOPIC: *Disease Risk Prediction and Value of Polygenic Risk Scores in Colorectal Cancer Screening*

ADVISOR: Dave Veenstra

Ifechukwu (Ben) Nwogu, MPH

PhD Student (Year 3)

DISSERTATION TOPIC: TBD

ADVISOR: Josh Carlson

PHD STUDENTS CONT

Ashley Tabah, MS, MPH

PhD Student (Year 4)

DISSERTATION TOPIC: *Closing the coverage gap: Understanding the cost and adherence effects for dementia*

ADVISOR: Ryan Hansen

Jacinda Tran, PharmD, MBA

PhD Student (Year 5)

DISSERTATION TOPIC: *Understanding HIV pre-exposure prophylaxis use in the United States and the potential impact of community pharmacists*

ADVISOR: Ryan Hansen

Rachel Wittenauer, MPH

PhD Student (Year 4)

DISSERTATION TOPIC: *Equitable access and reimbursement for pharmacy-based services: A case study of adult vaccinations*

ADVISOR: Andy Stergachis

MS FELLOWS

Zach Baldwin, PharmD, MS

AbbVie Post-PharmD Fellow (Year 2)

LOCATION: Chicago, IL

ADVISOR: Beth Devine

Jae Kim, PharmD, MS

AbbVie Post-PharmD Fellow (Year 2)

LOCATION: Irvine, CA

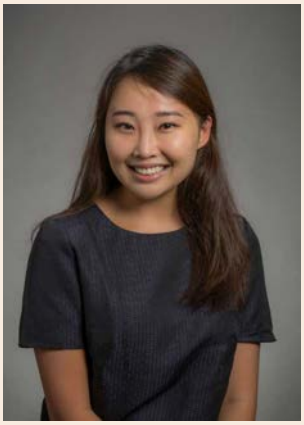
ADVISOR: Beth Devine

Spencer Cheng, PharmD, MS

Genentech Post-PharmD Fellow (Year 2)

LOCATION: San Francisco, CA

ADVISORS: Dave Veenstra & Aasthaa Bansal



Stella Ko,
PharmD, MS

Genentech Post-PharmD Fellow (Year 2)

LOCATION: San Francisco, CA

ADVISORS: Dave Veenstra & Aasthaa Bansal

Arvind Katta,
PharmD, MS

Bayer Post-PharmD Fellow (Year 2)

LOCATION: Whippany, NJ

ADVISOR: Ryan Hansen

Hyunwoo Kim,
PharmD, MS

Neurocrine Biosciences Post-PharmD Fellow (Year 2)

LOCATION: San Diego, CA

ADVISOR: Ryan Hansen

JAYANTH PANYAM SELECTED AS DEAN OF THE SCHOOL OF PHARMACY

We are excited to welcome Dr. Jayanth Panyam as our new Dean of the School of Pharmacy effective August 15, 2023. Panyam fills the position vacated last year by Sean Sullivan who returned to the faculty after more than eight years in the role. Peggy Odegard has been serving as interim dean.

Panyam comes to the UW from Temple University School of Pharmacy where he has been Dean since 2019. Prior to that, he was an endowed professor and head of the Department of Pharmaceutics in the College of Pharmacy at the University of Minnesota. At Temple, Panyam focused on pharmacy education and research. He has extensive experience training pharmacists and pharmaceutical scientists, supporting faculty in their advancement, and with student recruitment and admissions.

Panyam's research is primarily focused on investigating the mechanisms of drug delivery with an emphasis on understanding how various biological factors influence the effectiveness of delivery systems.

"The UW School of Pharmacy has a long history of leadership in all aspects of pharmacy and pharmaceutical sciences — education, scholarship and practice," Panyam said. "I am honored and excited to serve as the next dean."

Panyam earned his bachelor's in pharmacy from The T.N. Dr. MGR Medical University in Chenai, India, and his master's in pharmacy from Banaras Hindu University in Banaras, India. He earned his doctoral degree in pharmaceutical science from the University of Nebraska Medical Center in Omaha, Nebraska.

Read the full announcement here: https://sop.washington.edu/jayanth-panyam-selected-as-dean-of-the-school-of-pharmacy/

WELCOME, DR. CLAYTON ENGLISH, TO THE DEPARTMENT OF PHARMACY AND THE CHOICE INSTITUTE

Dr. Clayton English joined the Department of Pharmacy at the University of Washington School of Pharmacy in June. Dr. English earned his Bachelor of Science and Doctor of Pharmacy degrees from the University of Connecticut in Storrs, Connecticut and subsequently completed a postdoctoral specialty residency in clinical psychopharmacology and psychiatric pharmacy practice at Nova Southeastern University College of Pharmacy in Fort Lauderdale, Florida. He holds board certifications in Psychiatric Pharmacy (BCPP), Pharmacotherapy (BCPS), and Geriatric Pharmacy (BCGP).

Prior to joining UW, Dr. English worked as a safety evaluator in the Division of Pharmacovigilance at the FDA and previously served as an associate professor at Albany College of Pharmacy and Health Sciences. While serving on faculty, Dr. English also practiced as a clinical pharmacy specialist in psychiatry at the University of Vermont Medical Center (UVMMC) in Burlington, Vermont. During his time in Vermont, Dr. English helped expand clinical pharmacy services within inpatient psychiatry at UVMMC and precepted and assisted in the training of numerous students and residents in both pharmacy and psychiatry. He was highly involved in the didactic instruction of neuropsychiatric therapeutics and psychopharmacology across the pharmacy school curriculum.

Dr. English has broad clinical and research interests in neurologic and psychiatric pharmacy including safe and appropriate use of psychiatric medications, psychotropic deprescribing, pharmacovigilance, mood disorders, adult ADHD, and drug-induced behavioral disorders. Additionally, he is passionate about interprofessional education, team-based care, and student and resident well-being.

Dr. English is highly engaged in the professional development of pharmacists and enjoys participating in activities and organizations that advocate for the profession. He is an active member of the American Association of Psychiatric Pharmacists (AAPP) and serves as a Senior Editor for the AAPP Psychiatric Pharmacotherapy Review Book and Course. He has been honored for his contributions to the profession and education

of students and residents. He was the recipient of the Award of Excellence in Academic Teaching from the University of Vermont Psychiatry Residency Program in 2012, 2017, and 2019 and was recognized in 2013 as the Vermont Pharmacist of the Year by the Vermont Society of Health-Systems Pharmacists. Dr. English is excited to join UW and looks forward to collaborating with other CHOICE faculty on outcomes research related to behavioral health.

WELCOMING **NEW STAFF**

WE ARE PLEASED TO WELCOME TWO NEW STAFF MEMBERS TO THE DEPARTMENT OF PHARMACY AND CHOICE INSTITUTE

Leana de la Torre

Leana joined in March as the new CHOICE Online Certificate Program Manager. Leana earned her bachelor's degree in English Literature at UW Seattle, followed by a Certificate in Editing from UW Professional & Continuing Education. Leana began her career in student services at UW International Student Services. As a student advisor she helped international students navigate complex federal immigration regulations while meeting their academic and career goals. Leana is excited to now be providing student and program support for the online Certificate in HEOR. Outside of work, she loves doing arts and crafts with her kids, going to concerts, refurbishing old furniture, and reading books for her book club of 19 years.

Linda Luu

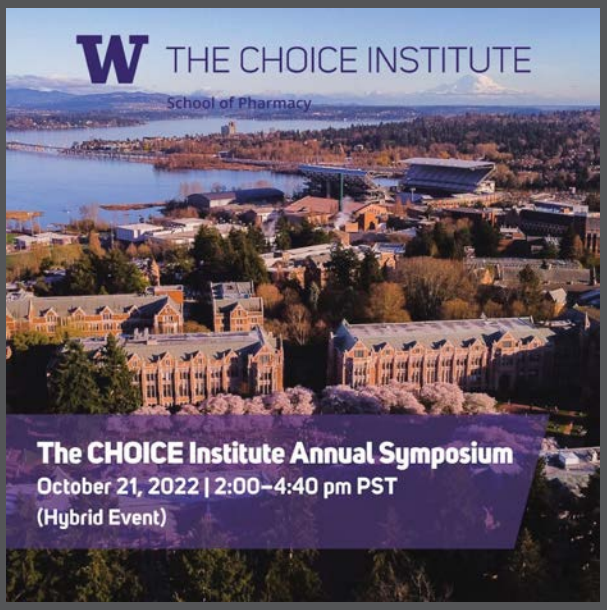
Linda Luu holds a Master of Science in Biostatistics from the University of Toronto and a Bachelor of Science in Biology from McMaster University. Her research interests are in simulation modeling and statistical applications to support health decision making. Outside of work she enjoys spending time with her cat, trying new restaurants and baking.

2022 ANNUAL SYMPOSIUM RECAP - HEALTH EQUITY IN HEOR

Health Equity is a multidimensional construct. In October, we were fortunate to host three outstanding faculty to discuss some of the relevant dimensions of health equity and their implications for our work in HEOR. Our speakers were Dr. Mónica García-Pérez, PhD, Professor of Economics at St. Cloud State University, Dr. Susan Griffin, PhD, Professor, University of York, Centre for Health Economics, and Dr. Sherri Rose, PhD, Associate Professor of Health Policy and Co-Director of the Health Policy Data Science Lab, Stanford University. This session was moderated by Professor Josh Carlson and led to some engaging discussions. The full recording can be found on the CHOICE Institute YouTube channel here:

https://www.youtube.com/watch?v=tYyA6YR9JEM

This fall, we will be hosting our next symposium on **Thursday, October 12, 2023**, focusing on topics surrounding Machine Learning in HEOR.



2023 **ANNUAL RETREAT**

Written by Julia Fox, Marina Gano, & Doug Barthold

We were thrilled to host our whole Institute, now nearly 40 strong, for our 2023 Annual Retreat with the theme "The World is Your CHOICE-ster." This year's planning team of Doug Barthold, Marina Gano, Ashley Tabah, Julia Fox, Spencer Cheng, and Stella Ko led the day on a wide range of activities ranging from trivia testing our knowledge of Seattle, health economics, musical artists and chemical elements, and pokemon vs. pharmaceuticals to a cost effectiveness analysis competition helping us to determine the best improvements we could bring to CHOICE (a special shoutout to our top groups suggesting a weather-controlled dome over the Health Science Building and massage chairs in the grad room). We were fortunate to welcome a special keynote speaker to our retreat, Dr. John O'Brien, CEO and President of the National Pharmaceutical Council, who shared his valuable insight on career development and upcoming challenges and opportunities in the field. Anirban Basu and Josh Carlson led a town hall announcing a "changing of the guard" with Jay Panyam as our new dean and Leana de la Torre joining our staff. We're thrilled to be growing our CHOICE community with these great additions and excited to welcome our new students this upcoming fall. We celebrated our recent graduates as well - Yilin Chen, Samantha Clark, Sabra Zaraa, Zach Baldwin, Spencer Cheng, Arvind Katta, Jae Kim, Hyunwoo Kim, and Stella Ko. We closed the retreat with our tradition of sharing "thank you" notes with those who have supported us in the past year, and, of course, bestowed the highest honor of CHOICE awards on the most deserving students. Notably, Shiven Bhardwaj earned "Most Likely to Know Everyone by the End of a Conference" and "Happy Hour MVP" for having nearly perfect attendance at student happy hours and Zach Baldwin won "Fellow Most Likely to Return for a PhD." After being part of a controversial tie last year, Frankie Tabah pulled through as the Favorite Pet this year, earning himself a coveted UW-purple ribbon. The retreat was followed by a reception just down the street at Magnuson Brewing overlooking the beautiful Pontiac Bay on a beautiful afternoon. We were honored to have CHOICE family, friends, partners, and children join us to close out a day of community and connection.

PICTURED RIGHT: CHOICE ATTEMPTS "JAZZ HANDS" FOR A GROUP PHOTO; ZIZI ELSISI & LOU GARRISON; HYUNWOO KIM, RON DICKERSON, ANIRBAN BASU, & KARRIS JEON WORK THROUGH HEALTH ECON TRIVIA; ASHLEY TABAH & SABRA ZARAA PRESENT THEIR PROPOSED INTERVENTION; FELIPE MONTANO-CAMPOS & LEANA DE LA TORRE CONNECT DURING SPEED NETWORKING.

ISPOR CHAPTER UPDATE

Written by Tori Dayer & Ben Nwogu

The University of Washington ISPOR Student Chapter was excited to offer multiple in-person, hybrid, and collaborative events this year! The student board, which included Tori Dayer (President), Ben Nwogu (Vice President), Ron Dickerson (Treasurer), and Elizabeth Carnesi (Secretary), planned and executed social events and informational events throughout the school year under the guidance of faculty advisor Dr. David Veenstra.

In the Fall, the Chapter kicked off the year with our first-ever elections. Student members were given the opportunity to run for board positions and vote to determine the 2022–23 student board. We also held a Halloween-themed social event with AMCP to network with pharmacy students. Throughout the year, students were invited to attend various seminars as part of the Alumni Professional and Career Development Talk Series that we started last year. The first was in December, with the topic "Research Organizations & Career Transitions", with CHOICE alumni Dr. Josh Roth and Dr. Kai Yeung as guest speakers. The second was "Careers in Industry", with Dr. Nina Hill and Dr. Maria Agapova. Both were offered in a hybrid format, with some students and speakers joining in-person and others via Zoom.

During the Winter quarter, the Chapter held two virtual (via Zoom) collaborative events with Student Chapters at other schools! The first was a collaborative event with the University of British Columbia, titled "Careers in Canada vs. USA – What's the difference?", where we were joined virtually by Dr. Kate Johnson (previous CHOICE Post-Doc) and Dr. Nicole Tsao, who both have experience working in the USA and Canada. The second collaborative event was with the University of Maryland, where our own Sara Khor (current CHOICE PhD student) led a Journal Club presentation on her recent publication (with co-authors Zizi Elsisi and Dr. Josh Carlson) on Equity in Health and students broke out into groups for discussion. Both collaborative events were well attended, and we look forward to further collaboration in the future! Winter Quarter ended with a few of our CHOICE students attending the 9th Biennial Western PharmacoEconomics Conference (WPEC) in Los Angeles, hosted by the University of Southern California. Our students greatly enjoyed the networking opportunity and getting to learn from many excellent

HALLOWEEN SOCIAL WITH AMCP

speakers! CHOICE PhD student Karris Jeon won the best podium presentation award at WPEC, and PhD students Emily Callen and Ben Nwogu won best poster presentation awards.

During Spring Quarter, CHOICE students that attended the ISPOR conference in person in Boston, MA enjoyed getting to connect with students from other chapters, and many students participated in poster and podium presentations! We closed out the year with a fun Happy Hour at Redhook Brew Lab.

This year, UW had significant representation in the ISPOR Student Network, with Jacinda Tran, Zizi Elsisi, Yilin Chen, Sara Khor, and PharmD Student Kevin Li serving on committees during the 2022-23 term. Ben Nwogu will be taking over as our 2023-24 UW Student Chapter President from the 2022-23 Chapter President Tori Dayer, and we are looking forward to the coming school year! Visit the CHOICE Blog, Incremental Thoughts: **https://choiceblog.org**

SOCIAL AT REDHOOK BREW LAB EMILY, FELIPE, HYUNWOO, & TORI AT WPEC; UW & UBC COLLABORATIVE EVENT – CAREERS IN THE USA & CANADA

WESTERN PHARMACOECONOMICS **CONFERENCE (WPEC) 2023**

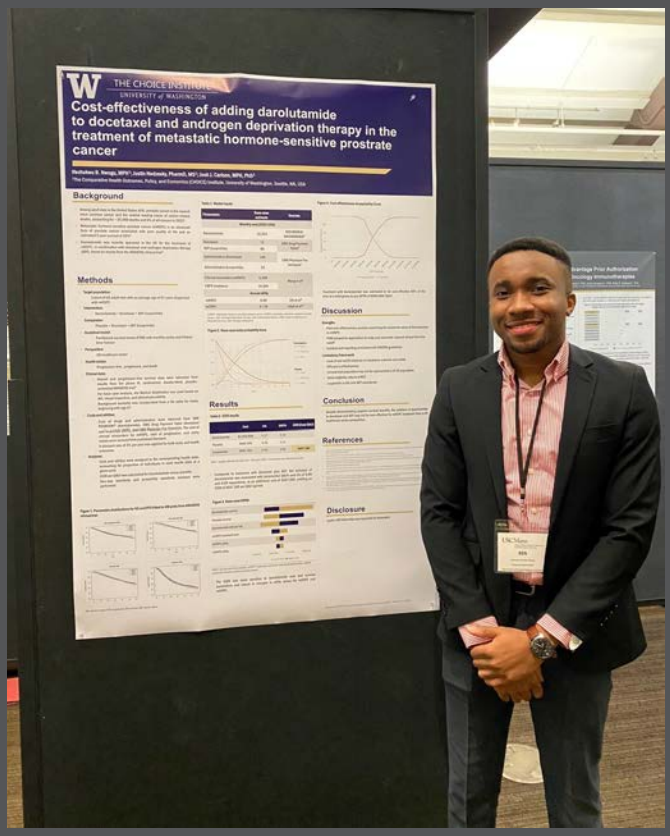
Our UW ISPOR chapter and faculty had the opportunity to network and learn about research in our field at WPEC in March, hosted at the University of Southern California. Eight students were able to travel to this conference, supported by the Penny Evans Student ISPOR Chapter Fund and the Higashi CHOICE Training Endowment.

Congratulations to PhD student, Karris Jeon, for receiving an Outstanding Podium Presentation Award at WPEC for her work titled, "Cost-effectiveness of onasemnogene abeparvovec in newborns with presymptomatic spinal muscular atrophy" which was also presented as a poster at ISPOR Boston.

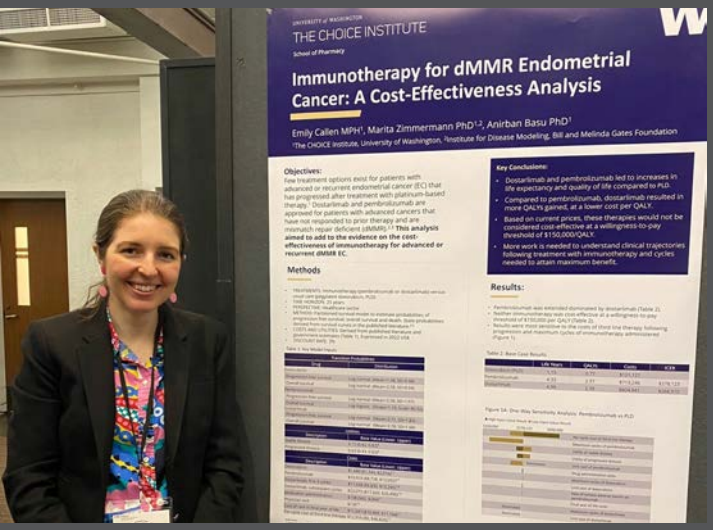
Additionally, we congratulate PhD students Ben Nwogu and Emily Callen for receiving Outstanding Poster Presentation awards at WPEC. Ben's work, titled, "Cost-Effectiveness of Adding Darolutamide to Docetaxel and Androgen Deprivation Therapy in the Treatment of Metastatic Hormone-Sensitive Prostate Cancer" was also presented during ISPOR Boston and highlighted in the Oncology poster tour. Emily's work, titled, "Immunotherapy for Advanced and Recurrent dMMR Endometrial Cancer: A Cost-Effectiveness Analysis" was also presented as a poster at ISPOR Boston.

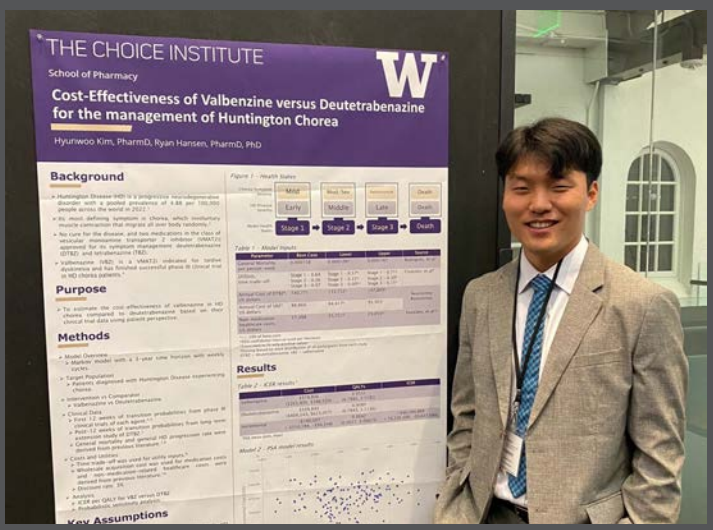
Our faculty were highly engaged in the conference as well, including participating in panel discussions on journal authorship (Devine, Carlson), grant funding (Veenstra), machine learning in HEOR (Bansal, Adamson), and alternative value measures (Basu). Additionally, Affiliate Assistant Professor, Blythe Adamson co-led a plenary session on Machine Learning in HEOR and Professor Anirban Basu led a plenary on Alternative Value Measures.

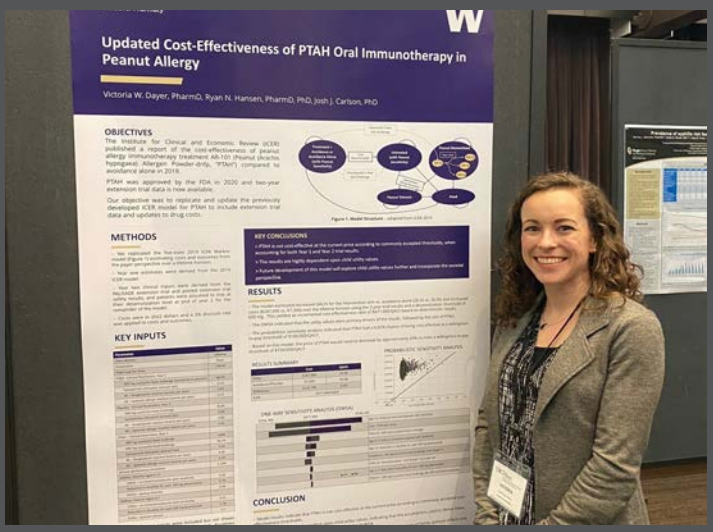
We look forward to hosting WPEC at University of Washington in March 2025!



ONLINE CERTIFICATE IN HEOR
PROGRAM UPDATE







The Certificate in Health Economics and Outcomes Research is entering its 12th year and continues to be a highly regarded program for working professionals looking to learn more about HEOR. Offered in partnership with UW Professional & Continuing Education, the online certificate program has trained over 550 students from a wide range of health care settings including payer organizations, health insurance companies, government, pharmaceutical and biomedical industries.

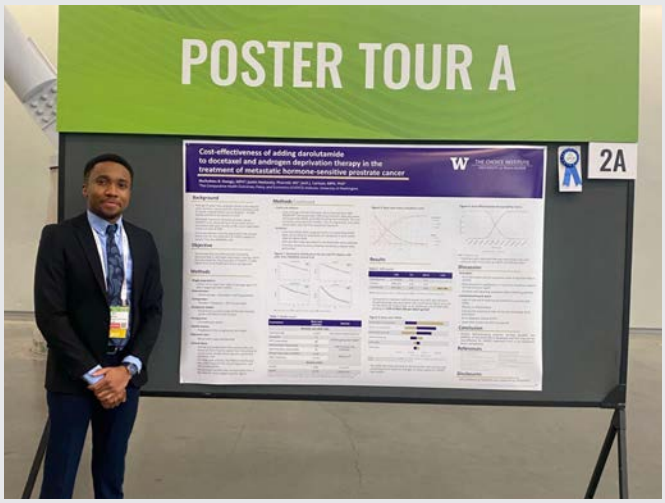
The program offers one course per academic quarter; Fall quarter: Principles of Health Economics, taught by Lou Garrison, Anirban Basu, and Douglas Barthold; Winter quarter: Economic Evaluation in Health and Medicine, taught by Dave Veenstra and Josh Carlson; Spring quarter: Practice of Health Technology Assessment in a Global Environment, taught by Sean Sullivan and Beth Devine. Students learn the key economic concepts and analytical tools of human economic behavior, explore the current state of the art in the economic evaluation of health care technologies, and are introduced to the principles and methods of HTA practice.

Students work in groups throughout the program on a capstone project, which applies their learning to an assigned country. Students can interact virtually with faculty during group meetings each quarter. Student evaluations have remained positive over the years. Applications have routinely been 40+ since the beginning of the program, with students enrolling from all around the U.S. and from over 30 countries. The program has an active LinkedIn alumni group. Courses are continually updated to incorporate changing technologies, economies, and policy. Faculty enjoy getting to meet certificate students at the CHOICE alumni reception during the annual ISPOR conference. Applications are currently open for the 2023-2024 certificate program. The application deadline is September 13, 2023. Interested in learning more about this program? Contact Leana de la Torre, Online Certificate Program Manager, at torre@uw.edu.

2023 **ISPOR ANNUAL CONFERENCE**

The 2023 ISPOR Annual Conference was in Boston, Massachusetts. We had a great turnout from students and faculty this year at the conference, with nearly all CHOICE students and fellows in attendance and presenting their work. As always — we extend a sincere thank you to all those who joined us on Monday night at Lord Hobo for our annual alumni & friends reception. This event continues to grow each year and is one of our favorite events we host. We look forward every year to catching up with our alumni and colleagues—old and new! Our students, faculty, and alumni made a great showing at ISPOR, through leading sessions and presenting their work as posters and podiums. On this page are a few key highlights and photos. We look forward to seeing all of you next year in Atlanta!

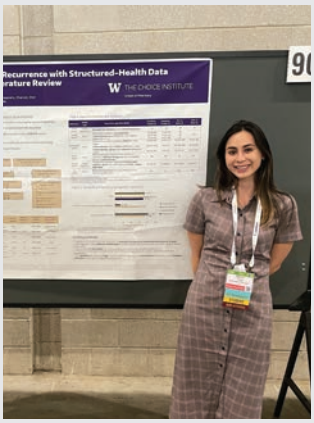
STUDENT RECOGNITIONS

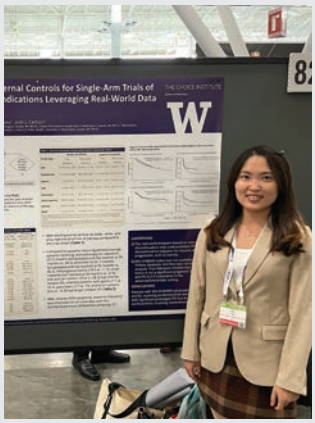


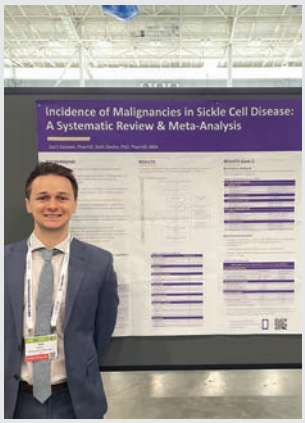
PhD student **Ben Nwogu**'s work was featured in the oncology poster tour and was recognized as a top 5% finalist for research presentations out of over 2,100 abstracts. His poster was titled, "Cost-Effectiveness of Adding Darolutamide to Docetaxel and Androgen Deprivation Therapy in the Treatment of Metastatic Hormone-Sensitive Prostate Cancer"

PhD students **Sara Khor** and **Felipe Montano-Campos** presented in podium sessions. Pictured above is Sara, who presented in the Health Equity podium session on her work titled, "Bias in, Bias out? Implications of Using Real-World Data with Differentially Measured Outcomes to Generate Prediction Models When Race Is a Predictor."

STUDENT PRESENTATIONS







ALUMNI & FRIENDS RECEPTION

FUN IN BOSTON

THE PROGRAM IN HEALTH ECONOMICS AND OUTCOMES METHODOLOGY (PHENOM)

The Program in Health Economics and Outcomes Methodology (PHEnOM) is a seminar series aiming to facilitate intellectual activities in the fields of health economics, econometrics, and methodology development in outcomes research and to engage researchers in allied fields. Key competencies of PHEnOM affiliates include health econometrics, health policy evaluation, applications in health capital, aging and disability, organization of healthcare, simulation methods, and comparative and cost-effectiveness analysis.

PHEnOM hosts a weekly seminar on Wednesdays, from 3-4:30PM, in the Department of Pharmacy Conference room (H371), with virtual attendance also available. Some highlights of the last year were presentations from Dr. Manasvini Singh (UMass Amherst) on how power dynamics influence physician decision making, and from Dr. Mark Meiselbach (Johns Hopkins) on the effects of minimum wage laws on the provision of employer-sponsored health insurance. We are looking forward to more interesting and impactful research at the PHEnOM Seminar during the 2023-24 academic year, and especially welcome nomination and self-nomination of speakers internal and external to UW.

This year, PHEnOM welcomes Dr. Jing Li, Assistant Professor of Health Economics, who has joined Dr. Douglas Barthold as a co-director of PHEnOM. Dr. Li joined the CHOICE Institute in 2022 from Cornell University's Weill Medical College where she was an Assistant Professor. Her research uses experimental and quasi-experimental methods to study economic and social mechanisms guiding individual decision-making in health and healthcare, and the impact of policies that leverage these mechanisms to improve patient outcomes and health care market efficiency. She is excited about contributing to PHEnOM's growth as an intellectual forum for rigorous Health Economics and Outcomes Research.

Please contact Dr. Barthold (barthold@uw.edu) or Dr. Li (jli0321@uw.edu) if you are interested in presenting at PHEnOM or subscribing to the PHEnOM-info email list.

GARRISON SPEAKS AT HTA CONFERENCES IN EGYPT AND INDIA

Professor Emeritus Lou Garrison spoke recently at health technology assessment (HTA) meetings held in Cairo and New Delhi with similar themes in both regions. HTA is well appreciated in both regions and steps are being taken to build institutions and capacity to carry out HTA.

Lou was a keynote speaker in the 1st Annual Arab Health Economics Meeting: Evolution of Health Economics in Arab Countries. Organized by Dr. Gihan Hamdy Elsisi (a UW HEOR Certificate recipient), head of HTA Office, the meeting focused on HTA development in the Middle East and North Africa region with participants from those countries. He emphasized that HTA itself is a technology that should be adapted to and efficient in the local context in order to accelerate access to innovative medicines.

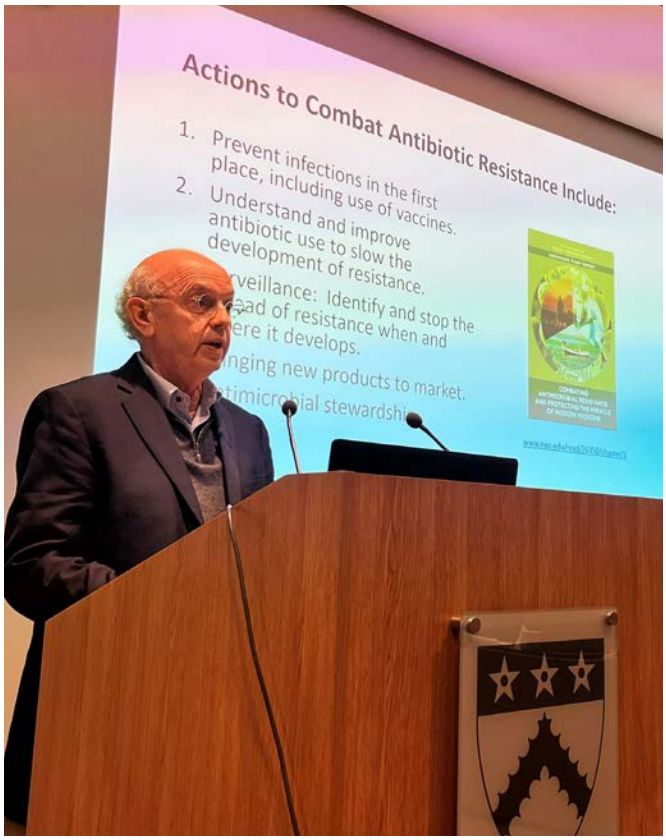
While in Cairo he was also invited to participate in an "Expert Consultation on HTA Transferability and Capacity" organized by the WHO Eastern Mediterranean Regional Office.

Lou then travelled to India, first, visiting Prof. Souvik Banerjee, a former CHOICE post-doctoral fellow, who teaches at the Indian Institute of Technology-Bombay. He spoke in Souvik's health economics class, and then the two of them went on to New Delhi to participate in the International Symposium of Health Technology Assessment: ISHTA 2023: "Affordability, Availability and Accessibility of Healthcare Technologies through Evidence generated by HTA for Universal Health Coverage." The symposium was sponsored by the WHO and the Center for Global Development. In his address, he emphasized the transferability of clinical evidence and the need for more rapid assessment of innovative medicines coupled with more aggressive price negotiation and differential pricing.

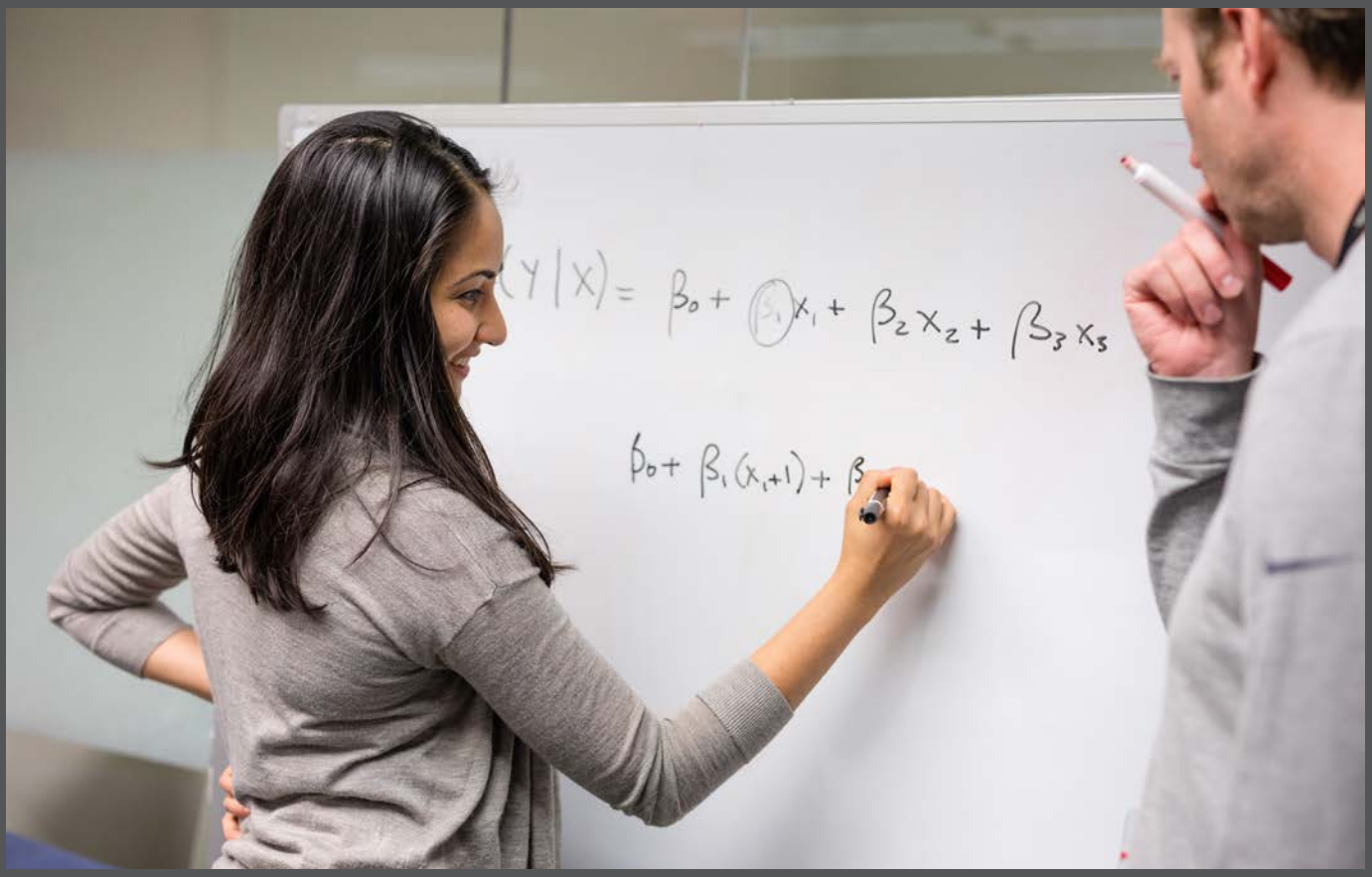
PROFESSOR ANDY STERGACHIS CO-LEADS INTERNATIONAL WORKSHOPS ON PHARMACOVIGILANCE AND ANTIMICROBIAL RESISTANCE

UW School of Pharmacy & CHOICE Institute Professor Andy Stergachis co-led an invitational workshop at the University of Oxford to discuss research on the relationship between substandard and falsified antimicrobials and antimicrobial resistance. Held on March 20–22, 2023, it was organized by the University of Washington Institute for Health Metrics Sciences and Global Medicines Program and the Medicine Quality Research Group FORESFA project in the Centre for Tropical Medicine & Global Health, University of Oxford. It brought together microbiologists, pharmacists, modelers, physicians, epidemiologists, implementers, policy makers and funders interested in this issue to help guide a newly funded continuation of the Global Research on Antimicrobial Resistance (GRAM) Project, https://www.healthdata.org/antimicrobial-resistance.

As a Global Expert Partner for the USAID-funded Medicines, Technologies, and Pharmaceutical Services (MTaPS) Program, Dr. Stergachis worked with Nepal's national pharmacovigilance center and Department of Drug Administration and Management Sciences for Health to strengthen the Nepal's national pharmacovigilance system through a series of three workshops held in Nepal over a five-day period in December 2022. A total of 60 healthcare and public health professionals from different institutions were trained on pharmacovigilance through these workshops. The trainings strengthened the capacity of attendees in identifying, reporting, analysis, and prevention of adverse drug reactions and adverse events following immunization. Through the MTaPS Program, since 2017, CHOICE faculty and trainees have strengthened pharmacovigilance systems or antimicrobial stewardship in several other countries, including Mozambique, Philippines, Tanzania, and Uganda.



PROGRAM ON MACHINE LEARNING IN HEOR



Under the leadership of Dr. Aasthaa Bansal and Dr. Beth Devine, we launched a new Program on Machine Learning in HEOR at CHOICE. There are several activities built around the program.

The CHOICE Institute is now offering currently enrolled PhD students Health Economics and Outcomes Research (HEOR) the opportunity to pursue a specialization in Data Science through a formal Degree Option. Students will explore the fundamentals in computation, machine learning, visual techniques, study designs, and statistics to address quantitative challenges in HEOR. They will develop the latest data analysis skills essential to advance research and improve the efficiency of decision-making processes. The option is based on a framework developed by the University of Washington eScience Institute.

Dr. Bansal will also be offering a new graduate level course on the Applications of Machine Learning in HEOR starting from Spring of 2024. This course will be a core requirement for the Degree Option in Data Sciences.

CHOICE is also embarking on developing a CHOICE Executive Series in Conveying Knowledge (CHECK Program) that is meant to offer short and focused training for senior management professionals working in the health care industry. The first training in this series will be on the Principles of Data Sciences in HEOR offered by Drs. Bansal, Basu, and Devine. The first part of this training will be offered to our Health Tech Fund (HTF) Participants this Fall.

Finally, a series of collaborations and research is already underway in this space. Our work on the use of race in clinical algorithms and racial disparities in cancer outcome ascertainment can be found on the following pages 30 & 31. Dr. Basu's work on algorithmic bias can be found on page 30. Additional work on machine learning in HEOR is highlighted with Dr. Bansal's R01 grant, PRAISE, on page 35, as well as on page 19 with a recap of our 2022 Annual Symposium.

OMITTING RACE IN CLINICAL ALGORITHMS

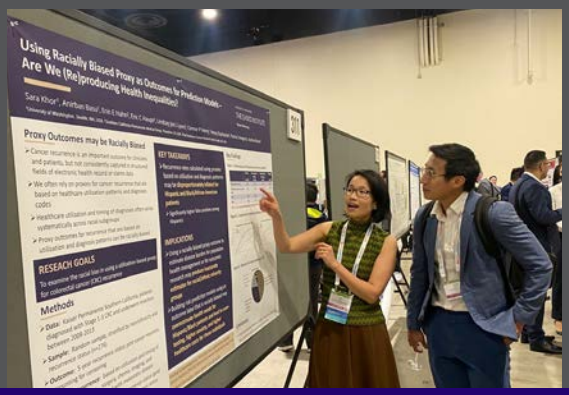
Written by Sara Khor

Clinical risk prediction algorithms have the potential to improve the quality and value of patient care by directing health care to those who need it. Clinicians have used these algorithms to inform a wide range of healthcare decisions, from kidney care to urinary tract infection testing to cancer screening. However, there are growing concerns that racial discrimination may be embedded in these algorithms and that using these algorithms for decision making may perpetuate healthcare and health outcome inequities. Some of these concerns stem from the use of race, a social construct, in these tools. Increasingly, policymakers and healthcare institutions are questioning algorithms that include race as a predictor and are seeking to remove the race variable from these equations. However, it remains unclear whether simply removing race as a predictor from existing algorithms will ultimately benefit racially minoritized patients.

A study led by PhD student Sara Khor and Associate Professor Aasthaa Bansal sought to better understand what the implications might be if race was omitted as a predictor in clinical risk prediction algorithms. The research team included collaborators from Kaiser Permanente Southern California and the Fred Hutchinson Cancer Center: Eric Haupt, Erin Hahn, Veena Shankaran, and Lindsay Joe Lyons. Using a risk equation for colorectal cancer recurrence as a case study, the researchers demonstrated empirically that including race as a variable resulted in a model that performed more equally across racial groups than a model that omitted race. This has important implications for those seeking to omit race from all models because algorithms that perform worse among minoritized racial groups can lead to inappropriate healthcare decisions that can in turn lead to more inequitable health outcomes. Their results underscored the importance of understanding the decision-making context and the potential downstream health disparity consequences when omitting race in order to avoid further contributing to systemic inequities. Their study findings were published in JAMA Network Open in June 2023 and featured in a few news outlets:

1. Khor S, Haupt EC, Hahn EE, Lyons LJL, Shankaran V, Bansal A. Racial and Ethnic Bias in Risk Prediction Models for Colorectal Cancer Recurrence When Race and Ethnicity Are Omitted as Predictors. JAMA Netw Open. 2023 Jun 1;6(6):e2318495. doi: 10.1001/jamanetworkopen.2023.18495. PMID: 37318804; PMCID: PMC10273018.
2. Palmer K. "Getting rid of bias in clinical calculators isn't as simple as taking race out of the equation." STAT News, June 16, 2023, **https://www.statnews.com/2023/06/16/colorectal-cancer-prediction-calculator-race-bias/**
3. NCI Center for Biomedical Informatics and Information Technology. "Addressing Racial and Ethnic Bias in Algorithms that Predict Colorectal Cancer Risk." **https://datascience.cancer.gov/news-events/news/addressing-racial-and-ethnic-bias-algorithms-predict-colorectal-cancer-risk**

SARA KHOR PRESENTING HER RESEARCH ON ALGORITHMIC BIAS AT ISPOR 2022.



RACIAL DISPARITIES IN CANCER OUTCOME ASCERTAINMENT

Written by Sara Khor

Real-world data (RWD) are increasingly being used for comparative effectiveness analysis and to develop prediction algorithms to inform clinical care. However, they are susceptible to existing biases in healthcare. Minoritized individuals, who interact less frequently with the healthcare system, may be more likely to have misclassified disease statuses in the RWD. PhD student Sara Khor and Associate Professor Aasthaa Bansal set out to examine whether colorectal cancer recurrence was captured with differential accuracy by race and ethnicity in RWD. For this work, they teamed up with CHOICE faculty Dr. Anirban Basu, UW Biostats faculty Dr. Patrick Heagerty, and collaborators from Kaiser Permanente Southern California Eric Haupt, Lindsay Joe Lyons, and Dr. Erin Hahn. Using data from a large integrated healthcare system, they found that cancer recurrences were less accurately captured among racial and ethnic minority groups compared to Non-Hispanic White patients. Specifically, they found that recurrence statuses for Hispanic patients were almost three times as likely to have been misclassified as positive compared to Non-Hispanic White patients. Their findings have potential repercussions for the wide adoption of RWD for health care management, outcomes research, and training clinical prediction algorithms. Using a cancer recurrence outcome that is less accurate among Hispanic and Black or African American patients to assess population-level treatment impact could systematically underestimate treatment benefits among these patients. Using a biased outcome label to train clinical prediction algorithms to inform clinical decisions may result in more inaccurate predictions for minoritized racial and ethnic groups, leading to inappropriate care and resource allocation decisions for these individuals, further perpetuating health disparities. Their research is published in the Journal of Clinical Oncology Clinical Cancer Informatics:

Khor S, Heagerty PJ, Basu A, Haupt EC, Lyons LJL, Hahn EE, Bansal A. Racial Disparities in the Ascertainment of Cancer Recurrence in Electronic Health Records. JCO Clin Cancer Inform. 2023 Jun;7:e2300004. doi: 10.1200/CCI.23.00004. PMID: 37267516.

PROFESSOR ANIRBAN BASU ADDRESSES 'ALGORITHMIC DISCRIMINATION' WITH NEW STUDY

Professor Anirban Basu published a paper in *Science Advances* on a controversial topic regarding whether variables such as race and ethnicity belong in clinical prediction algorithms.

Basu said the impetus for the paper was motivated by concerns raised by several federal and state committees about "algorithmic discrimination" as an unintentional outcome of how big data technologies and structures are used and can potentially encode discrimination in automated or humanistic decisions.

"This work tries to answer to what extent can the inclusion or exclusion of race or ethnicity variables as predictors or features in developing clinical algorithms induce algorithmic discrimination," he said.

These questions, and the framework presented in this paper for thinking about this issue, readily extend to all types of machine learning and AI algorithms, even outside health.

"Race is a social and not a biological construct," said Basu. "This distinction matters because certain arguments against using Race in developing clinical prediction models invoke this notion of Race not being a biological feature."

Basu noted that often researchers take a utilitarian approach that aims to maximize a (positive) outcome in the population, irrespective of who can do so, suggesting allocating resources to those with the most opportunities to generate outcomes or utilities. For this study, Basu applied the normative Equality of Opportunity (E.O.) framework, broadly used in many other fairness contexts in social sciences and law, and especially used by the U.S. Supreme Court for several landmark rulings.

"This is the first time anyone will apply this framework to hold machine learning and other artificial intelligence algorithms to the same standard of equity and, in the process, answer whether race should be included in these algorithms under ideal and real data conditions," he said.

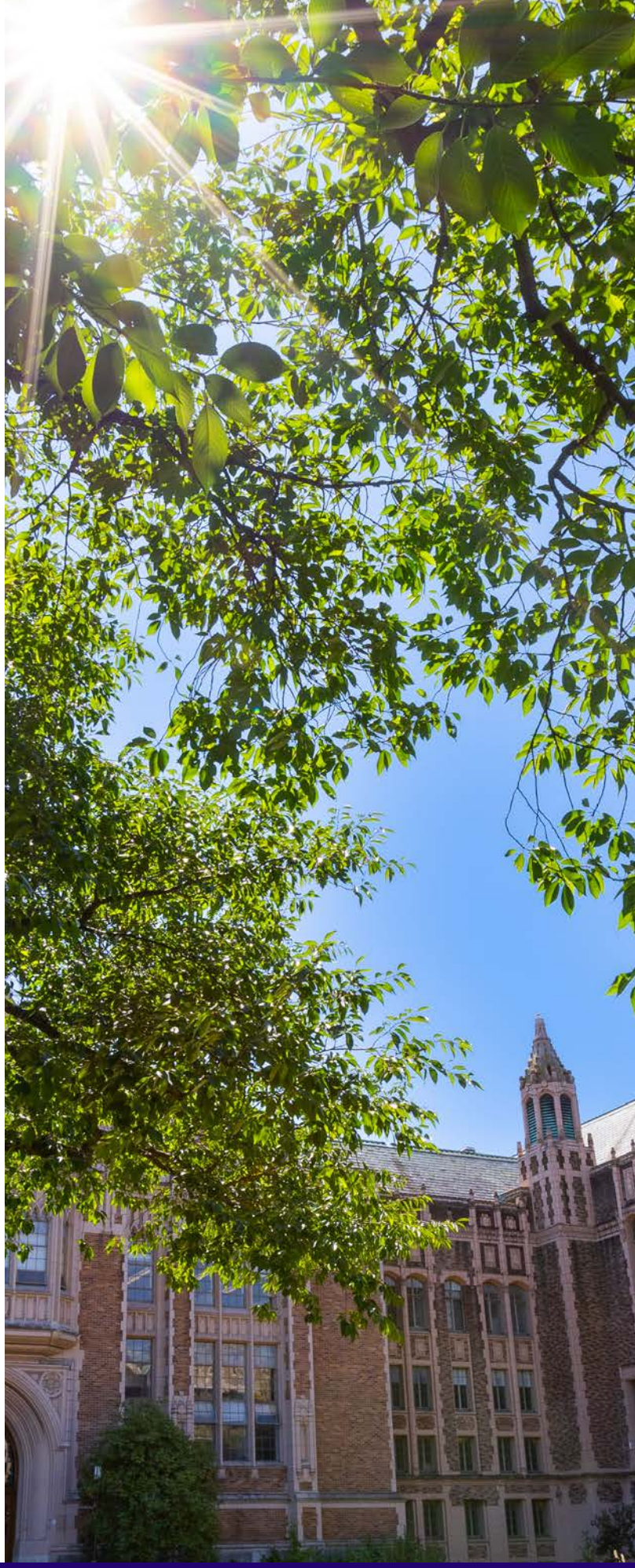
Basu's work follows two main ex ante E.O. principles: 1) inequality of outcomes is unethical if it arises due to differences in immutable circumstances. Such unethicality can be remedied by compensating individuals with disadvantaged circumstances, giving them the same opportunity to generate outcomes; and 2) inequality in outcomes arising from differential effort across individuals within each level of circumstances is not a moral bad (i.e., acceptable). Two individuals with the same circumstance should be rewarded differentially to preserve differences in their expected outcomes. The work takes these principles to evaluate algorithms and categorize them as 1) diagnostic algorithms (outcome already realized at the time point when decision-making happens using the predictions) and 2) prognostic algorithms that predict future outcomes relative to the time point of decision-making.

Basu shows that in ideal and practical settings, failure to include race corrections will propagate systemic inequities and discrimination in diagnostic models and specific prognostic models that inform decisions by invoking an ex-ante compensation principle. In contrast, including race in prognostic models that inform resource allocations following an ex-ante reward principle can compromise equal opportunities for patients from different races.

"To support these arguments, I use simulations studying how an established algorithmic discrimination metric is affected under different versions of algorithms that include race or not," said Basu. "In these simulations, I also study issues around measurement errors in outcomes, features, and race. Each has its own set of biases, but none changes the basic conclusions of the paper, based on the E.O. approach."

PATIENT OUT-OF-POCKET COSTS FOR TYPE 2 DIABETES MEDICATIONS WHEN AGING INTO MEDICARE

For people with type 2 diabetes, out-of-pocket medication costs influence medication choice, adherence, and overall diabetes management and progression. Little is known about how these costs change as people enter Medicare at age 65, when coinsurance in the coverage gap and catastrophic phases of Part D coverage can be driven especially high by use of newer, branded medications (e.g., DPP4 inhibitors, GLP1 agonists, and SGLT2 inhibitors). Dr. Douglas Barthold, along with collaborators Drs. Jing Li and Anirban Basu, are examining how these costs change as people transition into Medicare at age 65. We found that quarterly out-of-pocket costs for type 2 diabetes drugs increased significantly as individuals turned age 65, with substantial increase at the 95th percentile, despite a reduction in utilization. The Inflation Reduction Act will cap out-of-pocket spending, affecting 10% of Medicare beneficiaries with type 2 diabetes in 2025. Lower patient cost burden is likely to improve adherence and reduce complications and may also increase use of expensive newer classes of medications, substantially increasing costs to Medicare.



CHOICE TEAM CO-AUTHORS STUDY SUPPORTING ROUTINE GENOMIC TESTING FOR YOUNG ADULTS

Researchers from CHOICE Institute recently published a simulation modeling study in *Annals of Internal Medicine* that urges U.S. health policymakers to consider routine genomic testing of all adults aged 40 and younger for three genetic conditions posing high risk of devastating illness.

According to co-Principal Investigator and Professor David Veenstra, beginning to routinely screen young adults for genetic risks would be a historic step toward precision medicine.

"While these conditions are relatively rare, affecting about 1.5% of the population, affected individuals have very high risk of developing future disease and should be offered the effective preventative interventions that are available," he said.

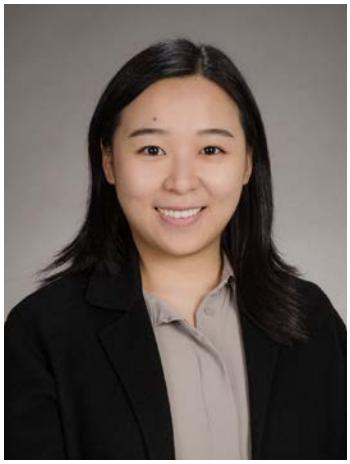
In addition to Veenstra, The CHOICE Institute team consisted of first author and Senior Scientist Gregory Guzauskas, MSPH, PhD; and PhD student Shangqing (Joyce) Jiang, MPH. They were joined by collaborators led by Josh Peterson, MD, MPH, Professor of Biomedical Informatics and Medicine at Vanderbilt University Medical Center; and Jing Hao, PhD, MD, MS, MPH from Geisinger Health, headquartered in Danville, Pennsylvania.

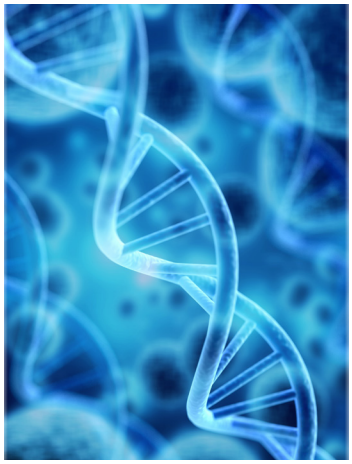
The team reported age-based cost-effectiveness of hypothetical one-time, all-in-one screening of U.S. adults aged 20 to 60 for three conditions: 1) hereditary breast and ovarian cancer syndrome, 2) Lynch syndrome (the most common cause of hereditary colorectal cancer), and 3) familial hypercholesterolemia, which increases blood levels of low-density lipoprotein (LDL) cholesterol and the likelihood of coronary heart disease and stroke at a younger age.

These three genetic conditions are designated by the U.S. Centers for Disease Control and Prevention as having the most evidence to support use of genetic testing for early detection and intervention. Testing for any of these conditions, when done at all, is currently limited to patients with a high-risk family history.

"The key lesson of the study is that we should be bundling genetic disorders into the same screening panel and testing individuals in advance while they are a young adult and prior to any disease onset," said Peterson.

- The researchers found that screening 100,000 30-year-olds, for example, would result in 101 fewer overall cancer cases and 15 fewer cardiovascular events across their lifetimes.





- With a test costing $250, a one-time screening of 20- to 40-year-olds was cost-effective, but screening older individuals was not, due to missed opportunities to prevent disease cases.

The analysis accounted for a range of factors, including the probability that a positive test result would prompt testing by family members, and the likely uptake of risk-reducing interventions such as prophylactic surgery (and the impact of these interventions on quality of life).

The study was supported by the National Institutes of Health (HG009694).

Research reported in this publication was supported by the National Human Genome Research Institute of the National Institutes of Health under Award Number HG009694. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

PERSONALIZED RISK-ADAPTIVE SURVEILLANCE (PRAISE)

Written by Aasthaa Bansal

Following primary treatment, many cancer survivors remain at risk of relapse and associated morbidity and mortality. Surveillance testing using biomarkers and imaging may detect cancer recurrence early and allow for timely treatment. However, many patients are at low risk of experiencing recurrence, and the costs of frequent tests are not justified for these patients. Experts have cautioned against over-testing and advocated for risk-based strategies using the personal clinical history of each patient to provide better tailored care to cancer survivors. Although there is recognition that a one-size-fits-all strategy of frequent testing is suboptimal, there is ambiguity regarding how best to tailor surveillance to individual cancer survivors.

The Personalized Risk-Adaptive Surveillance (PRAISE) team is conducting research that seeks to shift the paradigm of how routinely collected patient information is used for clinical management, by innovatively coupling machine learning based risk prediction modeling with statistical decision theory. The PRAISE decision-making framework considers the patient's risk of recurrence and evaluates the value of future clinical information to personalize the timing of surveillance testing (Bansal et al, Medical Decision Making 2022). This approach can be applied to a variety of diseases to guide personalized clinical care.

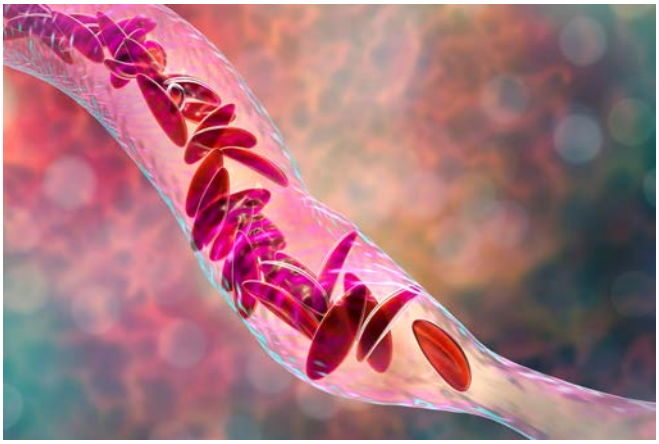
The team is currently using EHR data and applying the PRAISE framework to Colorectal Cancer (CRC) and Chronic Myeloid Leukemia (CML). In CRC, former graduate student Tricia Rodriguez led the development of a dynamic risk prediction model in a paper titled 'Using machine learning to leverage biomarker change and predict colorectal cancer recurrence' (in press in Journal of Clinical Oncology Clinical Cancer Informatics (JCO CCI)). Additionally, graduate student Sara Khor is leading investigations in algorithmic bias that were recently published in two papers: 'Racial and ethnic bias in risk prediction models for colorectal cancer recurrence when race and ethnicity are omitted as predictors', published in JAMA Network Open, and 'Racial disparities in the ascertainment of cancer recurrence in electronic health records', published in JCO CCI. She also gave a podium presentation at ISPOR 2023, titled 'Racial Bias in a Proxy Outcomes for Colorectal Cancer Recurrence' (see more on page 24). Finally, the team has been developing approaches to address missingness in EHR data; this work was presented by Dr. Aasthaa Bansal in a podium presentation at the Society for Medical Decision Making Annual Meeting in October 2022.

In CML, graduate student Felipe Montano-Campos has been leading investigations focused on using a patient's clinical and treatment adherence history to predict future biomarker values and risk of relapse to help guide clinical decision-making. He presented this work in podium presentations at the Western Pharmacoeconomics Conference 2023 and ISPOR 2023.

The team includes CHOICE faculty members Aasthaa Bansal (PI) and Anirban Basu, Research Scientist Linda Luu, graduate students Sara Khor and Felipe Montano-Campos, former graduate student Tricia Rodriguez, as well as collaborators from UW Biostatistics, Fred Hutch and Kaiser Permanente Southern California.

VALUING EMERGING GENE THERAPIES:
THE CASE FOR SICKLE CELL DISEASE

Written by Beth Devine & Anirban Basu



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NEWS RELEASES

Monday, May 16, 2022

Researchers identify the high costs of living with sickle cell disease

Potential curative therapies may help reduce the burden, but are also costly.

Americans ages 64 and younger with commercial health insurance who live with sickle cell disease (SCD) pay almost four times more out-of-pocket medical costs over their lifetimes, a total of $44,000, compared to people living without the disease. And insurers pay $ million on average for each person living with SCD, according to new research supported by the National Institutes of Health.

The healthcare spending analysis, which published today in *Blood Advances*, underscored the significant financial toll that sickle cell disease, an inherited blood condition, has on patients, their families, and the healthcare system.

"Identifying ways to reduce the burden many people living with SCD face is a critical part of coordinated research," said Kate Johnson, Ph.D., a study author who completed the research while working at The Comparative Health Outcomes, Policy, Economics Institute at University of Washington, Seattle. "We hope this analysis complements the larger scientific quest to identify cures for sickle cell diseas

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Oncology/Hematology > Hematology

Sickle Cell Disease Patients Miss Out on Decades of Life

— What effects might emerging therapies have on real-world survival?

by Mike Bassett, Staff Writer, MedPage Today March 12, 2023

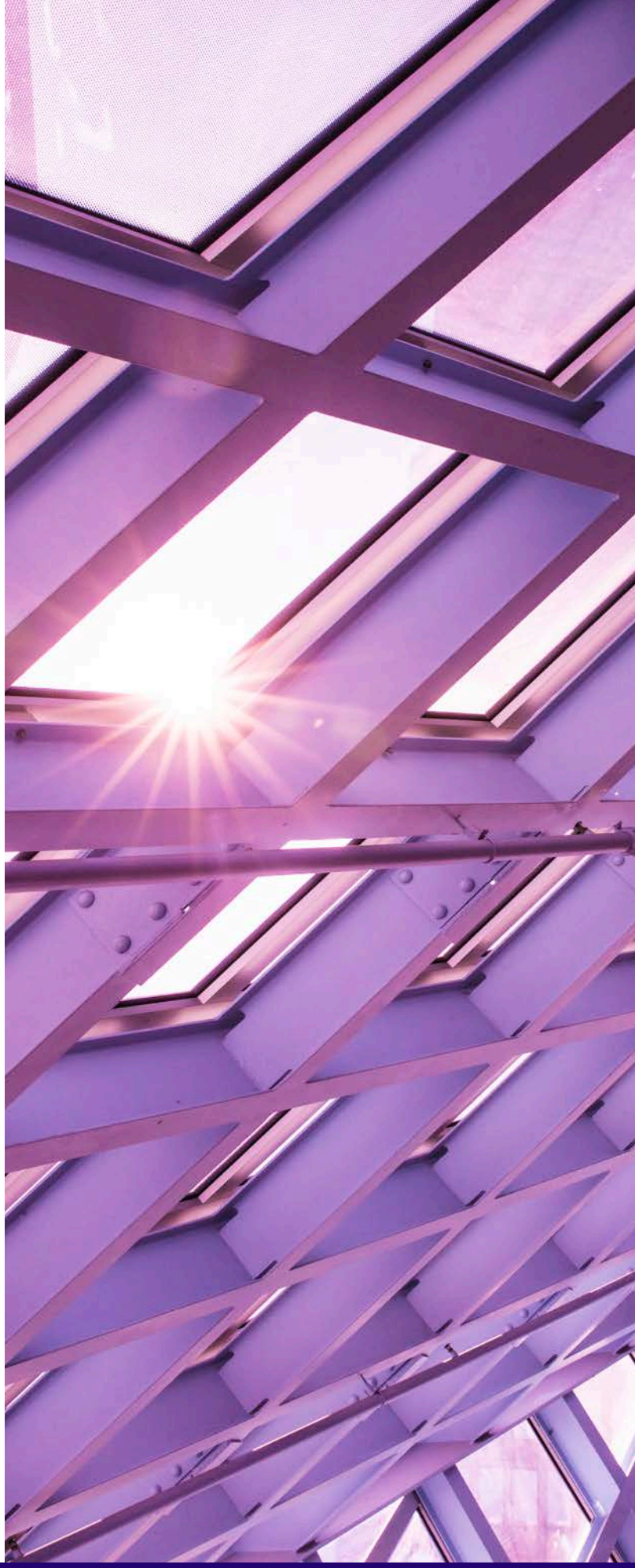
Sickle Cell Disease (SCD) is a monogenic gene disorder due to a beta-globin gene (HBB) variant. This variant produces sickled hemoglobin (HbS). The disease manifests with vaso-occlusive crises (VOCs), hemolytic anemia, organ damage, countless disease complications, and increased early mortality. VOCs and hemolytic anemia are the hallmarks of presentations. The global incidence of SCD is estimated to be between 300,000–400,000 live births per year. US prevalence is estimated at 100,000, occurring in 1 of every 365 Black or African American births. The economic burden is high, with an estimated annual spending on healthcare in the US at $2.98 billion. This amount does not include reduced productivity or health-related quality of life (HRQoL) experienced by those affected or their caregivers.

Standard supportive care treatments include hydroxyurea and periodic transfusions; both have attendant adverse effects, and neither halts disease progression. Newer, disease-modifying therapies (l-glutamine, crizanlizumab, voxelotor) are available, but uptake has been low due to a value proposition that could be better. The only known curative therapy is hematopoietic stem cell transplantation performed with an HLA-matched sibling donor. However, donors are found for <20% of patients, and effectiveness decreases with age. In June 2023, the FDA accepted Biologics License Applications for two gene therapies intended to be curative — BlueBird Bio's lovotibeglogene and Vertex Pharmaceuticals/CRISPR Therapeutics' exagamglogene. Both require a myeloablative conditioning regimen. To date, interim results are available for one phase I/2, a non-randomized, open-label trial of lovotibeglogene (Kanter et al.). In 35 patients who had experienced a minimum of four severe VOCs in the 24 months before treatment, lovotibeglogene eliminated all severe VOCs in at least the first six months following treatment. The price for each therapy could very well be north of US$2M.

In 2018, teams of investigators at The CHOICE Institute (PI: Basu) and the Fred Hutchinson Cancer Research Center (PI: Ramsey) received funding from the NHLBI's Cure Sickle Cell Initiative to estimate the value of these emerging therapies to inform national policy, coverage, and payment deliberations. Each team was tasked with independently creating an economic impact model while sharing database resources and was supported by staff from NHLBI, the Emmes Company, LLC, and two expert stakeholder panels.

A series of thorough landscape analyses revealed the need for more knowledge about the economic impact of the disease. These include no published cost-effectiveness studies that adopted the societal perspective, incorporated non-medical costs, or comprehensively modeled disease complexities; a dearth of studies measuring health state utilities (HSUs), with no utilities representing caregivers; insufficiently characterized costs across the SCD lifespan; and uncertain durability and lingering concerns of malignancies of gene therapies currently in clinical trials. Both teams then engaged to fill many of these gaps using original data analyses. A publication list arising out of these efforts can be found at https://sop.washington.edu/choice/research/research-projects/model-for-economic-analysis-of-sickle-cell-cure/.

Following the SMDM-ISPOR Taskforce on Good Modeling Practices, each team followed a stakeholder-engaged process to develop conceptual models to adequately define the economic decision problems and outline objectives — models that would represent disease complexity and would, of necessity, be informed by input parameters empirically generated by our teams. These conceptual models are published in peer-reviewed journals. The final models were then developed, coded, and validated for economic analyses. The UW Model For Economic Analysis of Sickle Cell Cure (MEASURE) is a microsimulation model that assesses gene therapy compared to Common Care in gene therapy-eligible individuals with SCD from a societal perspective. The work provides one of the most comprehensive health technology assessments from a societal perspective, as recommended by the Second Panel on Cost-Effectiveness in Health and Medicine. A joint paper featuring the UW and the Fred Hutch model and comparing the results is under review. Both models derive value-based prices for real-world gene therapy for this population. UW-MEASUE additionally considers Health Years in Total (HYT) as an alternative to QALYs since current laws explicitly prohibit CMS from considering a health metric that devalues the life extension of people with poor quality of life. We look forward to sharing these results in public soon.



EVALUATING THE INFLATION REDUCTION ACT **(IRA)**

CHOICE faculty have been actively engaged in discussing and debating the provisions for CMS to negotiate drug prices in the Inflation Reduction Act. Prof. Sullivan published an overview of this historic legislation and discussed implications for pharmaceutical prices and the market in the US in a Value in Health article (2023; 26(3): 394-399, https://doi.org/10.1016/j.jval.2022.11.015).

Prof. Sullivan along with other researchers at CHOICE and across the country, published a Health Affairs Forefront article highlighting the importance of understanding the impacts of technology on both life expectancy and quality of life. These discussions were in response to legislation the US House of Representatives was considering (HR 485) that would not only prohibit the use of the quality-adjusted life-year (QALY), but all other similar measures for coverage and payment determinations under all federal and state health care programs — affecting both Medicare and Medicaid. CMS has since produced final guidance making clear its intentions to consider and value quality-of-life effects and cost-effectiveness evidence.

Finally, Prof. Basu and others at CHOICE published a principles-based guide for CMS on specific attributes to consider when applying a cost-plus or a value-based price determination. They, however, strongly recommended that a value-based approach is the most appropriate way to proceed, unless there is overwhelming evidence to the contrary. The final CMS guidance appears to be aligned with such recommendations. Both Profs. Basu and Sullivan are working on projects funded by the Commonwealth Foundation to generate further guidance to CMS as they embark on this legislation-guided negotiation process this September.

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Alternatives To The QALY For Comparative Effectiveness Research

Sean D. Sullivan, Darius N. Lakdawalla, Beth Devine, Jens Grueger, Louis P. Garrison, Jr., Josh J. Carlson, David L. Veenstra, Charles E. Phelps, Anirban Basu

APRIL 21, 2023 10.1377/forefront.20230419.896238

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Medicare Drug Price Negotiations: A Principles-Based Guide For CMS

Anirban Basu, David L. Veenstra, Beth Devine, Josh J. Carlson, Sean D. Sullivan

JUNE 22, 2023 10.1377/forefront.20230620.965471

HEALTHCARE AND FINANCIAL DECISIONS FOR OLDER ADULTS WITH ALZHEIMER'S DISEASE AND RELATED DEMENTIAS

K01 Award from the National Institute of Aging for Dr. Jing Li

Dr. Jing Li, Assistant Professor of Health Economics and CHOICE Faculty Fellow, holds a K01 award from the National Institute on Aging which was transferred from her previous institution (Weill Cornell Medical College) to University of Washington, with Dr. Anirban Basu as the primary mentor. The K01 award allows Dr. Li to develop a research program on decision-making and wellbeing in aging, with a particular emphasis on older adults with Alzheimer's disease and related dementias (ADRD). These interests are informed by an enhanced awareness of the unique challenges faced by older adults with dementia due to cognitive decline and the increasing need, with aging, to maintain sound decision-making ability in navigating complex healthcare and financial decisions.

The K01 proposal was titled "Effect of Medicare Reimbursement for Care Planning on End of Life Care among Patients with Alzheimer's Disease and Related Dementias". This grant proposes to study the effect of two Medicare reimbursement policies that pay physicians to have advance care planning (ACP) conversations with patients, and to conduct detailed cognitive assessments and documented care planning activities for patients with cognitive impairments, on quality of end-of-life (EOL) care for older adults with Alzheimer's Disease and related dementias (ADRD). The research hypothesizes that billed ACP services can lead to improved quality of care and lower spending at EOL for patients with ADRD, potentially via better alignment of care with patient preferences and by shifting aggressive care to palliative and hospice care. Using an instrumental variables approach, the initial findings of the study indeed confirmed the hypothesis, with the working paper currently under review.

The K01 also funded Dr. Li's broader research agenda on healthcare and financial decisions for older adults with ADRD, which has yielded a number of influential publications. In a first-authored JAMA Network Open publication, Dr. Li and co-authors found that about three quarters (approximately 7 million) of U.S. older adults with dementia or other cognitive impairments were actively managing their own finances, and many of them owned large amounts of risky assets. The study was cited in over 40 news outlets. In another study as senior author, Dr. Li supervised a postdoctoral researcher in developing a new measure of wasteful healthcare spending at end of life using machine learning predictive modeling, which was published in Health Services Research. Her most recent work in this area, in collaboration with senior researchers, examines long-run wealth decline among older adults who eventually developed dementia, and the drivers behind such decline. The first paper from that project, forthcoming at JAMA Neurology, documents that older adults who eventually developed dementia lost about half of their wealth during the decade preceding dementia, compared to only about 10% decrease in wealth among those who did not develop dementia.

Dr. Li has been invited to present this line of work at several aging-themed seminars organized by the National Bureau of Economic Research (NBER), including the 2022 NBER Aging Summer Institute. She also organized and chaired a spotlight session on healthcare and financial decisions for older adults with dementia at the 2022 American Society of Health Economists Annual Meeting.

UW/ICER COLLABORATION UPDATE **2023**

Written by Josh Carlson

In 2016, the UW CHOICE Institute and the Institute for Clinical and Economic Review (ICER) formed a partnership establishing the first multi review academic site. This relationship has continued for 7 years and 3 additional contracts. The current team is comprised of Josh Carlson (PI), Kangho Suh (lead modeler), an Assistant Professor at the University of Pittsburg and a CHOICE alumnus, and 2nd year HEOR PhD Student Ronald Dickerson (Research Assistant). Our current contract runs through 03/31/24.

To date we have completed or are working on economic evaluations on 23 topics: Paroxysmal Nocturnal Hemoglobinuria (ongoing), Metachromatic Leukodystrophy (ongoing), Amyotrophic Lateral Sclerosis (2022), Chemotherapy induced myelosuppression (2022)Anemia in chronic kidney disease (2020-2021), Supervised Injection sites (2020), Ulcerative Colitis (2020), nonalcoholic steatohepatitis (2020 and 2023), Type II diabetes (2019, 2021), peanut allergy (2019), multiple myeloma (2016), non-small cell lung cancer (2016), plaque psoriasis (2016 and 2018), relapsing remitting multiple sclerosis (2017), secondary progressive multiple sclerosis (2019), atopic dermatitis (2017, 2021), osteoporosis (2017), RPE65-mediated inherited retinal disease (2018), Hemophilia A (2018), prostate cancer (2018), and hereditary angioedema (2018, 2021). Our work has been disseminated at ICER public meetings, as part of ICER's full topic reports, in conference proceedings (9 abstracts), and in peer reviewed journals (16 published).

In recent evaluations, we performed a review of treatments for Amyotrophic Lateral Sclerosis (ALS) and nonalcoholic steatohepatitis (NASH). For ALS, a virtual public meeting was held for the Midwest CEPAC on August 19th and the final report was posted on September 13, 2022. We found that over a lifetime time horizon, treatment with AMX0035 in addition to SOC resulted in incremental quality adjusted life years (QALYs) and equal value life years (evLYs) of approximately 0.14 and 0.31, respectively. Treatment with oral edaravone in addition to SOC resulted in incremental QALYs and evLYs of approximately 0.04 and 0.05, respectively. Neither drug was on the market at the time of report publication, but the health benefit price benchmark (HBPB) for AMX0035 ranged from $9,100 to $30,600 annually and for oral edaravone it ranged from $1,400 to $3,200 annually.

The NASH review was our second review of the disease. A virtual public meeting was held for the Midwest CEPAC on April 28th and the final report was posted on May 25th, 2023. We found that over a lifetime time horizon, treatment with resmetirom resulted in incremental QALYs and evLYs of approximately 0.61 and 0.69, respectively. Treatment with obeticholic acid resulted in incremental QALYs and evLYs of approximately 0.43 and 0.48, respectively. Neither drug was on the market at the time of report publication, but the health benefit price benchmark (HBPB) for resmetirom was $39,600 to $50,100 annually and for obeticholic acid it was $32,800 to $40,700 annually.

Finally, the UW team continues to be part of the ICER interactive modeler initiative that allows decision-makers within payers, pharmaceutical companies, and other stakeholders to access cost-effectiveness models via a web enabled platform. There are now 14 UW models available through the IM platform.

In summary, our collaboration with ICER continues, providing valuable research opportunities for faculty and students and contributing to timely and impactful conversations about the value of emerging products in the U.S. We look forward to continued collaboration with ICER and the many companies developing innovative medical products.

ASSESSING THE SAFETY OF DRUGS AND VACCINES USED DURING PREGNANCY

Written by Andy Stergachis

Pregnant women are at a higher risk of morbidity and mortality to certain pathogens, such as Zika virus, Ebola, Lassa Fever, influenza, SARS-CoV-2, and the parasite that causes malaria. Yet with few exceptions, vaccines and drugs are licensed and approved for marketing, with limited, if any, information on their safety and effectiveness during pregnancy because pregnant women and women of childbearing age without adequate contraception are routinely excluded from pre-licensure and pre-registration clinical trials, primarily due to fear of harm to the fetus. Consequently, vaccines and drugs used during pregnancy require post-approval safety surveillance beyond routine safety surveillance. With support from the Bill & Melinda Gates Foundation, Drs. Andy Stergachis and Sabra Zaraa teamed up with Tulane University and an international team to establish a living systematic review and meta-analysis of COVID-19 vaccines in pregnancy, which assesses vaccine safety, immunogenicity, efficacy and effectiveness in pregnant persons and their infants via an interactive online database, https://safeinpregnancy.org/lsr/. This open access, ongoing, interactive web-based tool ensures up-to-date findings are available to clinical and policy decision-makers, such as the World Health Organization (WHO). Pregnancy registries, also known as pregnancy exposure registries, are an essential tool for monitoring post-approval safety of vaccines and drugs used during pregnancy.

Dr. Stergachis has been involved in several initiatives to assess the safety of drugs and vaccines used during pregnancy. One of these studies led to WHO updating guidelines for treatment of malaria in the first trimester of pregnancy in November 2022. This action was based on the accumulation of well-defined first-trimester exposures and pregnancy outcomes reported over several years as pregnancy registry studies then as two systematic reviews and IPD meta-analyses, including those co-authored by Dr. Stergachis. Dr. Stergachis has also been collaborating with PATH on a scoping review to identify and describe pregnancy registries that operate in low- and middle-income countries. Additionally, Dr. Stergachis co-authored an open-source book chapter on maternal and neonatal safety surveillance systems to help guide the field.

ASSESSING IMPACT OF PHARMACIST ADMINISTERED CHILDHOOD IMMUNIZATIONS ON WELLNESS VISITS

Written by Jenny Bacci & Shiven Bhardwaj

With increasing evidence of effectiveness of pharmacist-administered immunization in adults, many states have expanded authority for pharmacy immunization programs to minors. Such expanded authority provides parents with opportunities to have their children adhere to CDC (Centers for Disease Control) recommended immunization schedule. Higher immunization rates may also be beneficial for communities by lowering their risk of infectious disease outbreaks; however, the impact is likely to be limited due to significant variation between states.

Opponents of the pharmacist authority expansion argue that receipt of immunizations outside of a primary care provider's clinic would result in missed well child visits. Annual well child visits are essential for preventive health services, growth assessments and evaluation and screening for various medico-social factors. Among the preventive services typically received in well child visits are immunizations. Currently, no empirical evidence exists to suggest whether receiving immunizations at pharmacies results in delay or skipping of well child visits.

Dr. Jennifer Bacci received the University of Washington Faculty Innovation Fund grant to explore the potential impact of pharmacist administered immunizations on well child visits. Using a nationally representative commercial claims database, she and her research team are assessing whether receipt of key vaccinations resulted in missed or delayed well child visits when compared to receipt of the same vaccination in an outpatient clinic setting. The research team includes Affiliate Assistant Professor Parth Shah (Fred Hutch), Lucas Berenbrok (University of Pittsburgh), and CHOICE PhD student Shiven Bhardwaj.

This study, and future work building off this study, have the potential to impact policy in states that do not currently support pharmacists ordering and administering all pediatric vaccinations for all ages and that do not currently support pharmacy enrollment as Vaccine for Children (VFC) program providers limiting their ability to serve as an access point for un- and under-insured children.

2023–2024 RECIPIENTS OF THE AMERICAN FOUNDATION FOR PHARMACEUTICAL EDUCATION (AFPE) PRE-DOCTORAL FELLOWSHIP IN HEALTH OUTCOMES DISPARITIES

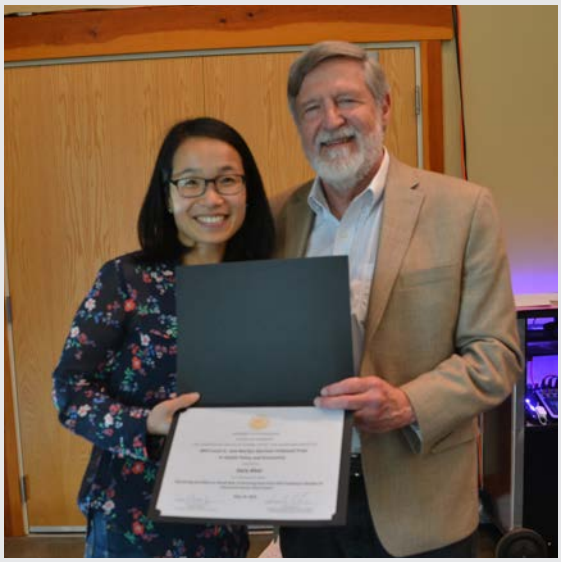
Rachel Wittenauer
PHD STUDENT

This year, PhD student Rachel Wittenauer was selected from a national pool of applicants to receive the American Foundation for Pharmaceutical Education (AFPE)'s Pre-Doctoral Fellowship in Health Outcomes Disparities. This award supports high-performing students to become outstanding leaders across industries. Rachel is grateful for the support of this fellowship and will use it to support her dissertation research on equitable access to pharmacy-based health services throughout the United States. Congratulations, Rachel!

We also congratulate PhD student Sara Khor whose 2022-2023 AFPE Pre-Doctoral Fellowship in Health Outcomes Disparities was renewed for the upcoming year. Congratulations, Sara!

2023 RECIPIENTS OF THE LOUIS SR. AND MARILYN GARRISON ENDOWED PRIZE IN HEALTH POLICY AND ECONOMICS

This award is intended to recognize annually an outstanding research paper in the area of health policy and economics. Professor Emeritus Lou Garrison and his wife Fran established this fund in 2008 in fond memory of his parents Louis P. Garrison, Sr., and Marilyn J. Garrison, who were great believers in the value of education and science. This year we were pleased to present this award to two students. Congratulations, Sara and Felipe!



Sara Khor
PHD STUDENT
PAPER TITLE: *Examining the Effect on Racial Bias of Omitting Race from Risk Prediction Models for Colorectal Cancer Recurrence*

Felipe Montano-Campos
PHD STUDENT
PAPER TITLE: *Argentine Valuation of the EQ-5D-3L Health States: An Experienced Utility Approach*

RECIPIENT OF THE 2023 UW SCHOOL OF PHARMACY GRADUATE STUDENT LEADERSHIP AWARD, DEPARTMENT OF PHARMACY

Sara Khor
PHD STUDENT

This Spring, Sara was selected as a recipient of the School of Pharmacy 2023 Graduate Student Leadership Award. The award decision is based on the consideration of demonstrated outstanding leadership and service that has had a positive impact on the School, UW and beyond.

Sara joined the program in September 2019 after working as a Research Scientist for the Surgical Outcomes Research Center. Her co-advisors are Drs. Aasthaa Bansal & Josh Carlson, and her dissertation research examines incorporating equity into healthcare decision making around new technologies.

"Sara is thoughtful, organized and always willing to take charge. She is also down-to-earth and a great listener and makes other students feel welcome and respected. These qualities have helped her emerge as a leader. She has demonstrated her leadership by representing the graduate students in several department- and school-wide committees this past year, and the School of Pharmacy Diversity, Equity, and Inclusion (DEI) Council. Sara is well-respected by both faculty and her peers, especially more junior students who appreciate her efforts to make them feel more comfortable in the program." - Aasthaa Bansal

Sara has also displayed leadership in several other academic activities at CHOICE. She helped develop the curriculum for and ran the CHOICE Summer Programming Bootcamp for incoming graduate students. She was also a fundamental part of the Health Economics certificate teaching team during staff transitions. Sara has shown leadership in the broader HEOR community, by serving as President of the UW-ISPOR student chapter. She led the student leadership team in expanding chapter membership, established the chapter as a registered student organization, and provided numerous

social, educational, and networking opportunities for the HEOR community at UW. Under her leadership, the UW-ISPOR chapter held joint workshops and networking events with PharmD students in the UW AMCP student chapter and co-hosted an Equity Workshop with the School of Pharmacy Diversity, Equity, and Inclusion Council, going on to win the ISPOR student network Outstanding Student Chapter of the Year Award.

When reflecting on the leadership experiences she has been a part of, Sara says, "These opportunities to give back to the community have reinforced in me the importance of collaboration and servant leadership. I understand the privilege of having a seat at the table on these important committees and thrive to fairly exemplify the voices of the students that I am representing."

Congratulations, Sara, on receiving this well-deserved recognition!

CHOICE PHD STUDENT JOYCE JIANG COMPETES IN THE 2023 HOLLOMON HEALTH INNOVATION CHALLENGE

Joyce Jiang led an interdisciplinary team of fellow UW graduate students called GenePedia and participated in the 8th annual Hollomon Health Innovation Challenge (HIC) hosted by the UW Foster School's Buerk Center for Entrepreneurship. Joyce, along with her teammates Sam Simlai, MS in Marketing, and Benjie Zuercher, MBA, developed an AI-powered Clinical Decision Support for genetic counselors. It provides pre-test, in-session and post-test support to help alleviate workload of genetic counselors and navigate patients throughout genetic care. Being recognized as an innovative digital health solution that has a high likelihood of being implemented in practical healthcare situations, Team GenePedia, out of more than 20 finalists in the competition, won the $2,500 Kent & Lisa Sacia Best Idea in Digital Health Prize.

Read more: https://blog.foster.uw.edu/health-innovation-challenge-2023-prizes/

PHOTO COURTESY OF MATT HAGEN / UW BUERK CENTER FOR ENTREPRENEURSHIP

PHD STUDENT SHIVEN BHARDWAJ AWARDED 2023 PLEIN FELLOWSHIP IN GERIATRIC PHARMACY RESEARCH

In July, Shiven was selected as a 2023–2024 Plein Scholar for his project proposal titled, "Assessing Impact of Synchronous Removal of Branded Products and Addition of Equivalent Generic Products to Medicare Part D Formularies." The Plein Endowment for Geriatric Pharmacy Research is a scholarship opportunity to foster student interest in geriatrics-related research. Rising costs of prescription drugs can place a strain on senior citizens who may be living on fixed income. Several legislative efforts and administrative rules have focused on improve access to prescription drugs in Medicare Part D. One such rule, passed in 2018 by department of Health and Human Services (HHS), allows Medicare Part D sponsors to remove a brand name drug from the formulary at the same time when an FDA approved generic equivalent is placed on the formulary. It is unclear whether this rule has made any measurable impact on Medicare Part D spend and utilization of generic drugs among Medicare beneficiaries. Shiven wants to assess impact of this HHS rule and whether it has led to any increases in generic drug utilization. He is working with his advisor Dr. Doug Barthold and with Dr. Inmaculada Hernandez from University of California, San Diego.

PROFESSOR SEAN SULLIVAN NAMED 2022 AAAS FELLOW

School of Pharmacy and The CHOICE Institute Professor Sean D. Sullivan is among four University of Washington researchers who have been named AAAS Fellows, according to a Jan. 31 announcement by the American Association for the Advancement of Science. They are among 506 new fellows from around the world elected in 2022, who are recognized for their "scientifically and socially distinguished achievements" in science and engineering.

A tradition dating back to 1874, election as an AAAS Fellow is a lifetime honor, and all fellows are expected to meet the commonly held standards of professional ethics and scientific integrity. The new fellows will be celebrated in Washington, D.C., in summer 2023.

Read more about Sean and the other recipients here: https://www.washington.edu/news/2023/01/31/four-uw-researchers-named-aaas-fellows-in-2022/

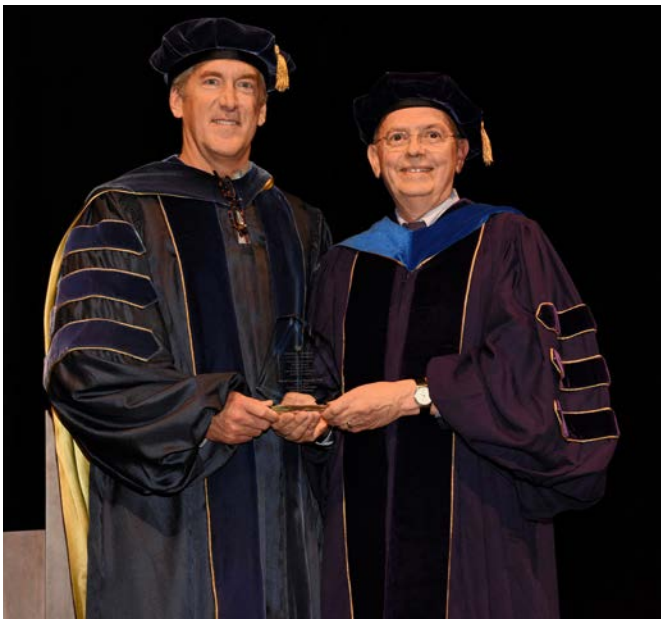
PROFESSOR EMERITUS LOU GARRISON RECEIVES ISPOR LIFETIME ACHIEVEMENT AWARD

Congratulations to Professor Emeritus Lou Garrison, who was awarded the 2022 Avedis Donabedian Lifetime Achievement Award by ISPOR — The Professional Society for Health Economics and Outcomes Research, recognizing his outstanding, life-long contribution to the improvement of health outcomes.

Lou joined the CHOICE faculty in 2004, and for the first 13 years of his career, he worked in non-profit health policy. Following this, he worked as an economist in the pharmaceutical industry for 12 years. From 2002–2004, he was Vice President and Head of Health Economics & Strategic Pricing in Roche Pharmaceuticals, based in Basel, Switzerland. Lou received a BA in Economics from Indiana University, and a PhD in Economics from Stanford University. He has more than 190 publications in peer-reviewed journals. Lou was elected as ISPOR President for July 2016–June 2017. He is currently serving as co-chair of ISPOR's Policy Outlook Committee for the Health Science Policy Council. Read more about the award and past recipients here: https://www.ispor.org/about/awards-grants/scientific-achievement-and-leadership-awards/avedis-donabedian-outcomes-research-lifetime-achievement-award?utm_medium=press_release&utm_source=public&utm_campaign=general_ispor&utm_content=awards_2022-honorees_sept13

PICTURED ABOVE: LOU GARRISON RECEIVING HIS AWARD IN SEPTEMBER 2022, PRESENTED BY THEN ISPOR PRESIDENT & CHOICE AFFILIATE PROFESSOR, JAN HANSEN, AND PROFESSOR SEAN D. SULLIVAN.

PROFESSOR DAVE VEENSTRA RECEIVES THE 2023 SCHOOL OF PHARMACY OUTSTANDING GRADUATE MENTOR AWARD



Pictured above, Professor Dave Veenstra was presented with the 2023 SOP Outstanding Graduate Mentor Award by Professor Andy Stergachis at this year's Graduate Recognition Ceremony. Dave joined the Department of Pharmacy faculty in 1999 and during his tenure has mentored over fifty graduate students, not including the hundreds of PharmD students he has taught during this time. Dave was nominated by a group of current and former students, and the impact his mentoring has had on our students is undeniable. In his letter of support for this nomination, Professor Josh Carlson states, "I have been witness to his mentoring of students as a peer for many years and always found that he had a gift for finding out how best to meet the student's needs and help them forward." One of his student nominators, Scott Spencer, reflects, "I cannot thank Dr. Veenstra enough for his support and mentorship both throughout my studies and to ensure that I landed a meaningful post-graduate position in our field. He is a staple in the rich academic culture of the University of Washington who is willing to discuss students' unique and interdisciplinary ideas while supporting them to move scholarship forward for the improvement of healthcare and public health." We are fortunate to have Dave as such a vital member of our graduate program, department, and school. Congratulations, Dave!

PROFESSOR EMERITUS BETH DEVINE MAKES STRIDES IN THE FIELD OF EVIDENCE SYNTHESIS

Through an Innovations Gap Fund Award she received from the UW CoMotion, Professor Emeritus Beth Devine has partnered with colleagues from the University of Bristol, University College London, and Kleijnen Systematic Reviews, Ltd. and is developing a publicly available web repository of tools/instruments that assess the validity and risk of bias of published trials and studies intended for inclusion in evidence synthesis projects. The ¨LATITUDES Network¨ (Library of Assessment Tools and InsTruments Used to assess Data validity in Evidence Syntheses) is intended as a companion site to the well-known and highly utilized EQUATOR Network — a repository of publication reporting tools. Attendees at the Annual International Meeting of the Society of Research Synthesis Methodology (Paris, France, July), where Drs. Devine & Savović delivered a live demonstration, were enthusiastic, and suggested that the repository will fill a substantive gap for investigators from across the globe who work in this field. The team plans to officially launch the LATITUDES Network at the Annual International Cochrane Colloquium in London in September. A shout out goes to CHOICE graduate student Ashley Tabah who assisted Dr. Devine in receiving this competitive, entrepreneurial award in spring 2021.

Aasthaa Bansal, PhD

Grants Awarded:

- Andy Hill CARE Fund. Use of Symptoms App and Biosensor to Address Disparities in Unplanned Emergency Department Visits Among Cancer Patients. Role: Co-Investigator.
- Genentech Inc. Fellowships in HEOR. Role: Co-Principal Investigator.

Jennifer Bacci, PharmD, MPH, BCACP

Grants Awarded:

- UW School of Pharmacy Faculty Innovation Fund, "Does community pharmacy-based pediatric vaccinations result in missed well-child visits?"
- UCB, Inc. Community Pharmacist Epilepsy Services Program. Role: PI.
- UW Center for Health Workforce Studies, "Envisioning New Career Pathways for Pharmacy Technicians" and "What is driving the enrollment crisis at schools and colleges of pharmacy?"

Doug Barthold, PhD

- Nominated for the 2023 School of Pharmacy Outstanding Graduate Mentor Award

Josh Carlson, PhD, MPH

- Nominated for the 2023 Marsha L. Landolt Distinguished Graduate Mentor Award
- Nominated for the 2023 School of Pharmacy Outstanding Graduate Mentor Award

Grants Awarded:

- NIH/NINR (Suabward from Cleveland Clinic). Clinical and Economic Impact of Teleneurology vs Standard in Clinic Care for Multiple Sclerosis: A Randomized Trial (year 2). Role: Subwaward PI.
- Benaroya Research Institute at Virginia Mason. Beat MS. Role: Principal Investigator.
- Seagen Master's Fellowship

Beth Devine, PhD, PharmD, MBA

- Appointed as Professor Emeritus, University of Washington, July 2023.
- Honorary Professor, University of Murcia, Murcia, Spain. 2. Guest editor: Frontiers in Pharmacology, ¨State of Science: Pharmacogenomics Implementation in Healthcare Systems and Communities."

Grants Awarded:

– Co-investigator, AHRQ Evidence-based Practice Center. Prostate Cancer Screening Topic Refinement for 2022 Systematic Review for the US Preventive Services Task Force.

Lou Garrison, PhD

- ISPOR Avedis Donabedian Outcomes Research Lifetime Achievement Award

Shelly Gray, PharmD, MS

Grants Awarded:

– NIH/NIA (Subaward from Kaiser). Adult Changes in Thought (ACT) Research Program (Year 3). Role: Project Co-Lead.

Greg Guzauskas, PhD

- Selected as one of the top ten most significant advances of the year in genomics by The Genomic Medicine Working Group of the National Advisory Council for Human Genome Research of the National Human Genome Research Institute (NHGRI), for the paper: Guzauskas G.F., et al. (2022). Cost-effectiveness of population-wide genomic screening for Lynch syndrome in the United States. Genet Med. 5, 1017– 1026.

Ryan Hansen, PharmD, PhD

- Continued appointment of Interim Chair, Department of Pharmacy

Grants Awarded:

- Bayer Fellowship Program

Kyueun Lee, PhD

- Appointed Chair of the CHOICE Graduate Student Travel Committee.

Grants Awarded:

- AbbVie Fellowship Program, Role: Co-Principal Investigator

Jing Li, MS, PhD

- Appointed co-director of the Program in Health Economics and Outcomes Research Methodologies (PHEnOM)

Grants Awarded:

- National Institute on Aging (NIA). Effect of Medicare Reimbursement for Care Planning on End of Life Care among Patients with Alzheimer's Disease and Related Dementias. Role: Principal Investigator.
- National Institute of Health Care Management Research Grant. The Effects of Physicians' Financial Transfers from Drug Firms on Prescribing of Physician-Administered Cancer Drugs. Role: Co-Principal Investigator.
- NIH (Subaward from UC Berkeley). Dementia Determinants in Caribbean and U.S. Hispanics. Role: Subaward PI.
- AbbVie Fellowship Program, Role: Co-Principal Investigator

PROFESSOR ANDY STERGACHIS WITH DR. ANTHONY FAUCI AT THE 2022 NATIONAL ACADEMY OF MEDICINE ANNUAL MEETING, WASHINGTON, DC

Andy Stergachis, PhD, BPharm

- Member, Committee to Review Relevant Literature Regarding Adverse Events Associated with Vaccines. National Academy of Medicine.
- Member, Evaluation Team for an ACPE Accreditation Visit, International Services Program. Accreditation Council for Pharmacy Education (ACPE).
- Member, WHO Consultation on Maternal and Perinatal Research during Epidemics and Pandemics, May 2023, Geneva Switzerland.

Grants Awarded:

- Fleming Fund. Global Research on Antimicrobial Resistance (GRAM) PHASE 2. (C. Murray, IHME & B. Sartorius, Oxford University, co-PIs). Role: Co-Investigator and co-lead for assessing the relationship between quality of medicines and AMR.
- PATH. Utilizing Private Pharmacy Capacity and Systems for COVID-19 Vaccine Delivery and Future Life-Course Vaccines. Role: Principal Investigator.
- U.S. Pharmacopeial Convention (USP). OHS Cross Bureau COVID-19 PY4 Workplan. Role: Principal Investigator.
- Washington Research Foundation. Grant in support of the BRAMS-WRF Regulatory Sciences Fellowship Program. Role: PI.

Sean D. Sullivan, BScPharm, MSc, PhD

- 2023 Elected, Fellow American Association for the Advancement of Science (AAAS)
- Visiting Professor, London School of Economics and Political Science

Grants Awarded:

- SD Sullivan (Co-Investigator) Informing Medicare Prescription Drug Price Negotiations: Integrating Net Prices and Comparative Effectiveness Assessments for the Initial Price Offer. The Commonwealth Fund. 2023-2024.

David Veenstra, PharmD, PhD

- Awarded the 2023 School of Pharmacy Outstanding Graduate Mentor Award

Grants Awarded:

- Genentech Inc. Fellowships in HEOR. Role: Principal Investigator.

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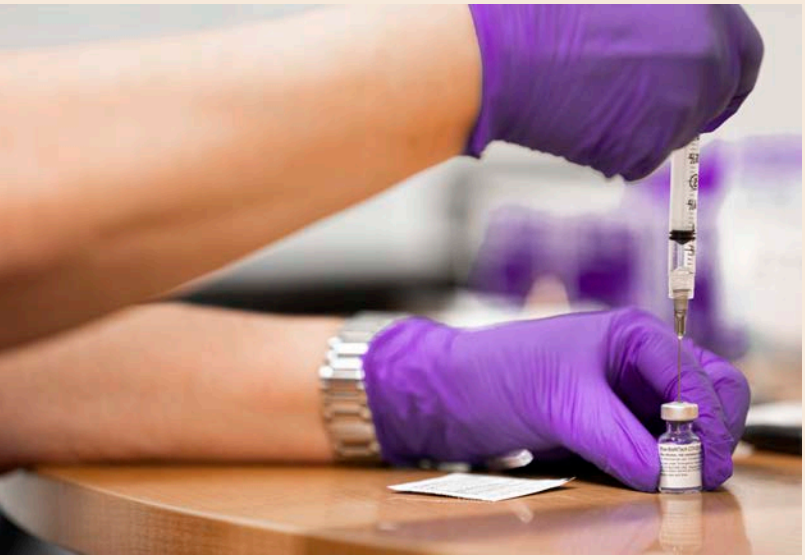

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2022–2023 IMPACT OF PRIVATE SUPPORT

4
Fully Funded RA-ships for PhD Students

6
Faculty Received Endowed Salary Supplements

24
Students Received Travel Funding for Conferences

19
Students Received Supplemental Fellowships

12
MS Fellows Funded

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