

Hutchinson Institute for
Cancer Outcomes Research

2022 Annual Report



HICOR Vision

We believe that every cancer patient should get quality care that meets their goals at a reasonable cost, wherever they live.

HICOR Mission

Improve the effectiveness of cancer prevention, early detection, and treatment services in ways that reduce the economic and human burden of cancer.

HICOR Research Portfolio



Financial Burden of Cancer

Understanding the causes and finding ways to prevent patients and caregivers from experiencing financial hardship as a result of a cancer diagnosis.



Cost-Effectiveness

Evaluating and comparing the costs and health outcomes of one or more interventions to inform clinical practice and policy.



Cancer Care Delivery

How the delivery of care, including organizational structures and processes, financing and reimbursement and healthcare provider and patient knowledge and behaviors impact the health outcomes and well-being of patients and survivors.



Health Disparities

Identifying and addressing preventable differences in the burden of disease or opportunities to achieve optimal health between population groups.

From the Directors



Scott Ramsey, M.D., Ph.D.
Director

The last two years have been a very busy and productive time for HICOR. We launched new studies to address cancer care disparities in Washington state, published results from two first-of-their-kind national cancer care delivery trials, released the 2021 and 2023 Community Cancer Care Reports, and continued to nurture the next generation of researchers through our fellowship and research training programs.

In September we welcomed Dr. Carolyn Rutter, our newest HICOR faculty member. She brings deep expertise in microsimulation modeling and model calibration and shares our commitment to research that helps us understand and address healthcare inequities.



Veena Shankaran, M.D., M.S.
Co-Director

This year, HICOR investigators will start a number of new research grant proposals that span the breadth of our portfolio. These studies are aimed at advancing care delivery research by testing innovative strategies to mitigate financial toxicity, optimize cancer screening and prevention, and explore the use of mobile technologies and modeling to inform better models of care delivery for medically underserved populations.

On November 2, 2023 we are excited to host our eighth annual Value in Cancer Care Summit and look forward to our continued collaboration with regional stakeholders to develop and refine new actionable metrics, including those that reflect the impact of COVID-19 in our region.

Our team has emerged from the pandemic with a renewed sense of optimism and dedication to bringing together our colleagues and communities to improve care delivery in ways that lead to better outcomes for patients and their families. We look forward to the great work ahead!

A handwritten signature in black ink, appearing to read 'Scott Ramsey'.

Scott Ramsey, M.D., Ph.D.

A handwritten signature in black ink, appearing to read 'Veena Shankaran'.

Veena Shankaran, M.D., M.S.

Faculty Profiles



**Aastha Bansal,
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Affiliate Investigator, HICOR;

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Assistant Professor, HICOR;

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Associate Professor, HICOR;

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Associate Professor, Gastroenterology and Hepatology, Clinical Research Division, Fred Hutch;

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Carolyn Rutter, Ph.D.

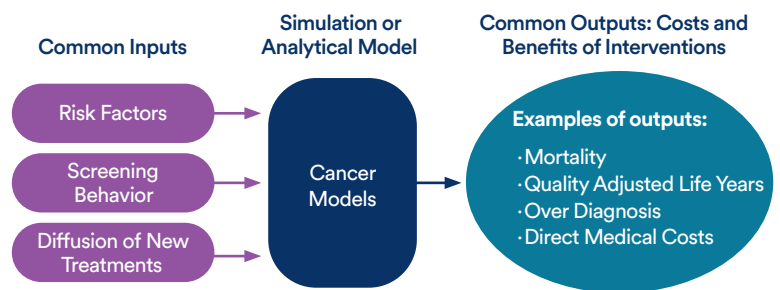
Bringing the Evidence Together

Ever wonder how the recommended age for colorectal cancer screening changed from 50 to 45? Decision makers, such as members of the US Preventive Services Task Force are faced with a mountain of data. Modeling is a way to describe how all of these pieces of information fit together, and to predict how screening scenarios will operate in the real world. Modeling allows us to understand how changing levers – such as reducing the age or changing the frequency of screening – are likely to impact patient outcomes and healthcare costs. Dr. Carolyn Rutter is a principal investigator for a Cancer Intervention and Surveillance Modeling Network (CISNET) team focused on colorectal cancer and led the development of the CRC-SPIN microsimulation model. Her CISNET work focuses on reducing the population burden of colorectal cancer by comparing the effectiveness of policies for CRC control.

Dr. Carolyn Rutter | Photo by Robert Hood

“Policy matters because it can shape people’s behaviors. It’s exciting to provide the information needed to set policy because these decisions have real-world effects so it’s critical that we get it right.”

General Formulation of CISNET Model Inputs and Outputs



source: <https://resources.cisnet.cancer.gov/registry/learn/>

Coming Home to the Hutch

HICOR was delighted to welcome Dr. Carolyn Rutter as a faculty member in 2022. Having served as an affiliate member at Fred Hutch in 2012-2014, Dr. Rutter is excited to return “home” to her focus on cancer research. She is also looking forward to

the opportunity to cultivate the next generation of researchers through the fellowship programs at HICOR. She is inspired by the ability that high-quality models have to inform policy to address healthcare inequities.

Improving Equity in Cancer Outcomes



Illustration by Stephanie Liszewski

“It works. And... there are people like me who kind of fall between the cracks, we don’t have any kind of support system. And just having the rideshare made a difference.”

-PARTICIPANT

Removing Barriers: Ride Share Transportation for Colonoscopy Patients

Colorectal cancer is the second leading cause of cancer deaths in the United States. Dr. Rachel Issaka was one of the first to report that only 56% of patients in a safety-net healthcare system with an abnormal FIT completed a colonoscopy within one year of their result. Due to the administration of procedural sedation, access to transportation is a frequently cited barrier to colonoscopy completion and a likely contributor to lack of FIT follow-up.

Dr. Issaka is leading a pilot study that offers rideshare, arranged by the clinic, to patients at a safety-net hospital who express that securing a ride home after colonoscopy will be challenging. Preliminary results from the study are

overwhelmingly positive. 100% of participants made it to their destination safely, and all said they would use the service again and recommend it to others. Participants have highlighted short wait-times, convenience, no costs, autonomy in medical care, and no delay to colonoscopy as program benefits they appreciate.

A **safety net hospital** is a type of medical center in the United States that by legal obligation or mission provides healthcare for individuals regardless of their insurance status or ability to pay, or immigration status.

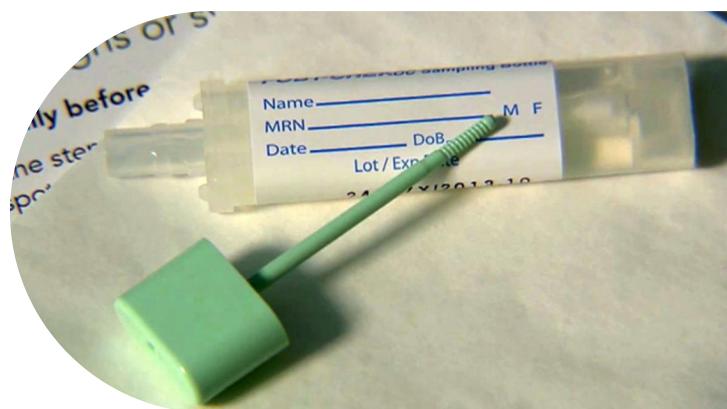
Improving Access: Bringing Cancer Screening to the Community

Despite national recommendations, colorectal cancer (CRC) screening completion is sub-optimal across the board, and lowest among underserved populations: uninsured or publicly insured, low income, poorly educated, rural, and racial/ethnic minorities. Several evidence-based strategies exist for increasing CRC screening, including screening with fecal immunochemical test (FIT) kits, but most of these strategies are implemented through primary care providers, clinics, and healthcare systems.

Pharmacies are the most accessible healthcare settings in the US and for many patients, are more often visited and more convenient than primary care clinics for certain preventive services like FIT kits. Dr. Parth Shah is leading a study to investigate the feasibility of pharmacy-located CRC screening services in Washington, which has the potential to lead to more equitable access to CRC screening in rural and other medically underserved populations where cancer-mortality disparities are growing.

“Geographic access to primary care is a common barrier to receiving health services, especially in rural and underserved populations. To address this problem, we need convenient, affordable solutions that can be implemented within the same communities where people work and live.”

- DR. PARTH SHAH



The fecal immunochemical test (FIT) is designed to be simple and non-invasive.

89% of U.S. residents live within 5 miles of a community pharmacy and make around 250 million weekly visits to locations with pharmacies. A recent study showed that Medicare beneficiaries visit a pharmacy an average of 13 times per year, compared to 7 visits per year to their primary care provider. Unlike most primary care clinics, pharmacies have longer operating hours, shorter wait times, and can typically see patients without appointments.

Improving Equity in Cancer Outcomes

Offering Support: Financial Navigation Services for Patients and Caregivers

Many cancer patients and families experience financial hardship, leading to poor outcomes.

Dr. Veena Shankaran led a randomized study among gastric/gastroesophageal patients with cancer and their caregivers in Seattle to test a proactive financial navigation intervention. The intervention included support with insurance interpretation, budget planning, and help with out-of-pocket medical expenses for patients and their caregivers.

Participants randomized to the intervention arm were less likely to experience financial hardship and declines in quality of life than those who did not receive navigation services. Results also emphasized the toll a cancer diagnosis has on caregivers; across both groups caregivers reported poorer quality of life and financial stress over time. Dr. Shankaran is now leading a larger study to test a similar intervention in clinics across the U.S.



Illustration by Stephanie Liszewski

Assistance provided to study participants:



- Appealing insurance denials
- Budgeting
- Out-of-pocket medical expenses
- End of life arrangements
- Living expenses
- Medication payments
- Emotional support
- Disability benefits
- Accessing charity care
- Cost of insurance premiums
- Employment protections
- Transportation
- Nutritional support

Our Partners

HICOR partnered with two community organizations with considerable experience in financial navigation to deliver the study intervention to participants.



Patient Advocate Foundation (PAF) provides case management services and financial aid to Americans with chronic, life threatening and debilitating illnesses.

“Financial distress can intensify confusion and uncertainty in navigating the complexities of the healthcare system, including worries about affording medical care, how to keep a roof over their head and a source of income. In its most acute form, financial distress forces life-altering choices between buying groceries or paying for life-saving prescriptions or medical care. Fear of sharing is a reality as they may feel that addressing the financial aspects may compromise their care. This is where PAF helps people navigate complexities inherent in the health system by linking individuals and families to appropriate government, national, state, community, and disease specific resources.”

-ERIN BRADSHAW
Chief of Mission Delivery,
PAF



CENTS
CONSUMER EDUCATION
AND TRAINING SERVICES

Consumer Education and Training Services (CENTS) empowers people to improve their financial health by developing educational and legal resources to help them prevent or overcome financial challenges.

“This study tested both patients and counselors as COVID reared its ugly head. In-person counseling became impossible, getting care was an even bigger challenge for patients, and home and work challenges created additional stress for everyone. We were heartened to see the resilience of both patients and counselors as they quickly adapted to new remote communication strategies and worked together to overcome all of these challenges to lessen the financial stress for patients.”

-JUDGE KAREN OVERSTREET
Judicial Liaison,
CENTS



“

“I feel very fortunate to get to work with the HICOR team during my training. Starting off one’s research career can be daunting but with the mentorship and guidance I’ve gotten from the entire HICOR team, I feel very supported in the exploration of my research interests and in my learning. I’m looking forward to continuing to grow personally and professionally with the team.”

- DR. KWENDAKWEMA

“I am so grateful to be able to work with HICOR during my oncology fellowship. As a trainee, I have had the opportunity to be involved in meaningful research with a broad impact, on both a local, and a larger-scale level. I have gained valuable experience that I will use to build my own career as an outcomes researcher, to continue improving the lives of patients with cancer.”

- DR. KHAN

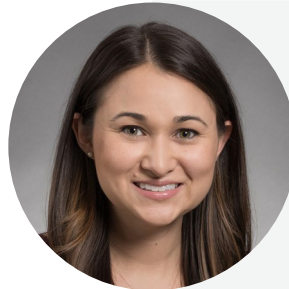
“The mentorship and support from the HICOR team helped me to thrive during the entirety of my fellowship. I believe this multifaceted experience has helped me to grow and improve as a researcher through challenging, collaborative projects and supplementary training opportunities.”

- DR. ALLEN

■ TRAINEES

Developing the Next Generation of Cancer Care Delivery Researchers

HICOR is committed to advancing high quality research that drives clinical practice and policy change, and to developing the next generation of leaders in cancer outcomes research.



Lauren Shih, M.D.

Hematology-Oncology Fellow,
Fred Hutch and University of Washington



C. Natasha Kwendakwema, M.D.

Hematology-Oncology Fellow,
Fred Hutch and University of Washington



Hiba Khan, M.D., M.P.H.

Hematology-Oncology Senior Research Fellow,
Fred Hutch and University of Washington



Stefan Allen, Pharm.D., Ph.D.

Cost-Effectiveness Fellow,
Fred Hutch and Bayer

Surviving Cancer in a Global Pandemic

In collaboration with the MultiCare Research Institute and sponsored by the Andy Hill CARE Fund, Dr. Scott Ramsey led an effort to conduct focus groups centered around understanding the cancer survivor experience of undergoing treatment during the COVID-19 pandemic. Discussion topics included COVID-19's impact on treatment, social support, mental health, testing and vaccine experiences, economic impacts, and experiences of bias and racism. Results revealed impacts of COVID on participants' cancer care: treatment delays, hospital policies limiting visitors, vaccination requirements,

and telehealth appointments. They also highlighted psychological impacts: isolation and fear of contracting COVID, loneliness, and symptoms of depression and anxiety. This research aimed to center the unique experiences of cancer survivors in the height of the pandemic. Their reflections suggest that patient mental and emotional health support, along with resources to address the social determinants of health (such as food insecurity, housing, transportation, employment, and socioeconomic status) are critical areas for improvement in our healthcare system.

Focus group participants reflected on the many challenges faced as cancer survivors navigating the COVID-19 pandemic.

“

“...I went into [the hospital] right... in September [when] they cut all visitors off again. So, I was in [the hospital] for almost two weeks with no visitors.”

“

“...the death tolls rising, the infection cases rising. I'm indoors, scared of going outside, I might contract COVID-19 together with my cancer...I kept worrying.”

“

“I had serious delays as far as my surgery...because... The hospital wasn't staffed enough... To hold surgery.”

Partnering to Prevent Colorectal Cancer

HICOR's Dr. Rachel Issaka is the director of the Fred Hutch & UW Medicine Population Health Colorectal Cancer (CRC) Screening Program, which launched in 2021. In March 2022, the Program held its first CRC Community Awareness event in partnership with nine local organizations. Community members learned how to prevent and reduce their risk for colorectal cancer. Participants had the opportunity to take home CRC screening test kits, walk through an inflatable colon (CECE), get connected to healthcare resources, and listen to survivor stories. The event was attended by nearly 100 community members. Attendees reported a 40% increase in understanding colon polyps and a 10% increase in the likelihood they would talk to their doctor about CRC screening.



Photo by Leo Carmona

Select Publications

■ **Shah PD**, Calo WA, Gilkey MB, Margolis MA, Dailey SA, Todd KG, Brewer NT. Easing human papillomavirus vaccine hesitancy: A communication experiment with US Parents. *American Journal of Preventive Medicine*. 2021;61(1):88-95. doi:10.1016/j.amepre.2021.02.009

■ **Issaka RB**, Rachocki C, Huynh MP, Chen E, Somsouk M. Standardized workflows improve colonoscopy follow-up after abnormal fecal immunochemical tests in a safety-net system. *Dig Dis Sci*. 2021;66(3):768-774. doi:10.1007/s10620-020-06228-z

■ **Issaka RB**, Bell-Brown A, Snyder C, Atkins DL, Chew L, Weiner BJ, Strate L, Inadomi JM, **Ramsey SD**. Perceptions on barriers and facilitators to colonoscopy completion after abnormal fecal immunochemical test results in a safety net system. *JAMA Netw Open*. 2021;4(8):e2120159. doi:10.1001/jamanetworkopen.2021.20159

■ **Issaka RB**, Taylor P, Baxi A, Inadomi JM, **Ramsey SD**, Roth J. Model-based estimation of colorectal cancer screening and outcomes during the COVID-19 pandemic. *JAMA Netw Open*. 2021;4(4):e216454. doi:10.1001/jamanetworkopen.2021.6454

■ Calo WA, Gilkey MB, **Shah PD**, Dyer AM, Margolis MA, Dailey SA, Brewer NT. Misinformation and other elements in HPV vaccine tweets: An experimental comparison. *J Behav Med*. 2021;44(3):310-319. doi:10.1007/s10865-021-00203-3

■ **Fedorenko CR**, **Kreizenbeck KL**, Li L, Panattoni LE, **Shankaran V**, **Ramsey SD**. Stage at cancer diagnosis during the COVID-19 pandemic in western Washington State. *JCO*. 2021;39(28_suppl):145-145. doi:10.1200/JCO.2020.39.28_suppl.145

■ Panattoni LE, Li L, Sun Q, **Fedorenko CR**, Sanchez H, **Kreizenbeck KL**, **Shankaran V**,

Ramsey SD. Medicaid patients more likely to die at home without hospice during the pandemic versus before, exacerbating disparities with commercially insured patients. *JCO*. 2021;39(15_suppl):6502-6502. doi:10.1200/JCO.2021.39.15_suppl.6502

■ **Ramsey SD**, Panattoni LE, Li L, Sun Q, **Fedorenko CR**, Sanchez H, **Kreizenbeck KL**, **Shankaran V**. Disparity in telehealth and emergency department use among Medicaid and commercially insured patients receiving systemic therapy for cancer in Washington State following the COVID-19 Pandemic. *JCO*. 2021;39(15_suppl):6546-6546. doi:10.1200/JCO.2021.39.15_suppl.6546

■ **Shankaran V**, Li L, **Fedorenko CR**, Sanchez H, Du Y, Khor S, **Kreizenbeck KL**, **Ramsey SD**. Cancer diagnosis and adverse financial events: Evidence from credit reports. *JCO*. 2021;39(15_suppl):6504-6504. doi:10.1200/

JCO.2021.39.15_suppl.6504

■ Goulart BHL, Unger JM, Chennupati S, **Fedorenko CR**, **Ramsey SD**. Out-of-pocket costs for tyrosine kinase inhibitors and patient outcomes in EGFR- and ALK-positive advanced non-small-cell lung cancer. *JCO Oncology Practice*. 2021;17(2):e130-e139. doi:10.1200/OP.20.00692

■ Khaki AR, Chennupati S, **Fedorenko C**, Li L, Sun Q, Grivas P, **Ramsey SD**, Schwartz SM, **Shankaran V**. Utilization of systemic therapy in patients with cancer near the end of life in the pre- versus post-immune checkpoint inhibitor eras. *JCO Oncology Practice*. 2021;17(11):e1728-e1737. doi:10.1200/OP.20.01050

■ **Shankaran V**, Chennupati S, Sanchez H, Sun Q, Li L, **Fedorenko C**, Aly A, Healey M, Seal B. Clinical characteristics, treatment patterns, and

FEATURED PUBLICATION

A Study of Financial Hardship in Metastatic Colorectal Cancer Patients

This national trial measured the financial impact of cancer treatment in a diverse population of newly diagnosed colorectal cancer patients. 380 adults diagnosed with metastatic colorectal cancer (cancer that has spread outside of the colon) completed quarterly surveys for 12 months. This data was used to estimate the cumulative incidence of major financial hardship (MFH), defined as 1 or more of: increased debt, new loans from family and/or friends, selling or refinancing home, or 20% or more income decline. Nearly 3 out of 4 enrollees experienced major financial hardship despite access to health

insurance. Income < \$100,000 and total assets < \$100,000 were associated with greater MFH.

This study is part of a larger effort to develop and test interventions that protect cancer patients and their families from financial harm. Dr. Veena Shankaran is currently conducting the CREDIT Study, a randomized trial testing whether providing patients and caregivers with free financial navigation services close to the time of diagnosis reduces the risk of financial hardship. She is also exploring other novel strategies such as unconditional

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■ **Shankaran V**, Unger JM, Darke AK, Suga JM, Wade JL, Kourlas PJ, Chandana SR, O'Rourke MA, Satti S, Liggett D, Hershman DL, **Ramsey SD**. S1417CD: A prospective multicenter cooperative group-led study of financial hardship in metastatic colorectal cancer patients. *J Natl Cancer Inst*. 2022;114(3):372-380. doi:10.1093/jnci/djab210

healthcare costs and utilization for hepatocellular carcinoma (HCC) patients treated at a large referral center in Washington State 2007–2018. *Journal of Hepatocellular Carcinoma*. 2021;8:1597-1606. doi:10.2147/JHC.S328274

■ **Watabayashi KK, Bell-Brown A, Kreizenbeck K, Egan K, Lyman GH, Hershman DL, Arnold KB, Bansal A, Barlow WE, Sullivan SD, Ramsey SD.** Successes and challenges of implementing a cancer care delivery intervention in community oncology practices: Lessons learned from SWOG S1415CD. *BMC Health Services Research*. 2022;22(1):432. doi:10.1186/s12913-022-07835-4

■ **Bell-Brown A, Chew L, Weiner BJ, Strate L, Balmadrid B, Lewis CC, Hannon P, Inadomi JM, Ramsey SD, Issaka RB.** Operationalizing a rideshare intervention for colonoscopy completion: Barriers, facilitators, and process recommendations. *FrontHealth Serv*. 2022;1:799816.

doi:10.3389/frhs.2021.799816

■ **Ramsey SD, Bansal A, Sullivan SD, Lyman GH, Barlow WE, Arnold KB, Watabayashi K, Bell-Brown A, Kreizenbeck K, Le-Lindqwister NA, Dul CL, Brown-Glaberman UA, Behrens RJ, Vogel V, Alluri N, Hershman DL.** Effects of a guideline-informed clinical decision support system intervention to improve colony-stimulating factor prescribing: A cluster randomized clinical trial. *JAMA Netw Open*. 2022;5(10):e2238191. doi:10.1001/jamanetworkopen.2022.38191

■ **Shankaran V, Li L, Fedorenko C, Sanchez H, Du Y, Khor S, Kreizenbeck K, Ramsey S.** Risk of adverse financial events in patients with cancer: Evidence from a novel linkage between cancer registry and credit records. *JCO*. 2022;40(8):884-891. doi:10.1200/JCO.21.01636

■ **Bell-Brown A, Watabayashi K, Kreizenbeck K, Ramsey SD,**

Bansal A, Barlow WE, Lyman GH, Hershman DL, Mercurio AM, Segarra-Vazquez B, Kurttila F, Myers JS, Golenski JD, Johnson J, Erwin RL, Walia G, Crawford J, Sullivan SD. An evaluation of stakeholder engagement in comparative effectiveness research: lessons learned from SWOG S1415CD. *J Comp Eff Res*. 2022;11(18):1313-1321. doi:10.2217/ce-2022-0158

■ **Tafazzoli A, Ramsey SD, Shaul A, Chavan A, Ye W, Kansal AR, Ofman J, Fendrick AM.** The potential value-based price of a multi-cancer early detection genomic blood test to complement current single cancer screening in the USA. *PharmacoEconomics*. 2022;40(11):1107-1117. doi:10.1007/s40273-022-01181-3

■ **Baldwin Z, Jiao B, Basu A, Roth J, Bender MA, Elsis Z, Johnson KM, Cousin E, Ramsey SD, Devine B.** Medical and non-medical costs of sickle cell

disease and treatments from a us perspective: a systematic review and landscape analysis. *PharmacoEconomics Open*. 2022;6(4):469-481. doi:10.1007/s41669-022-00330-w

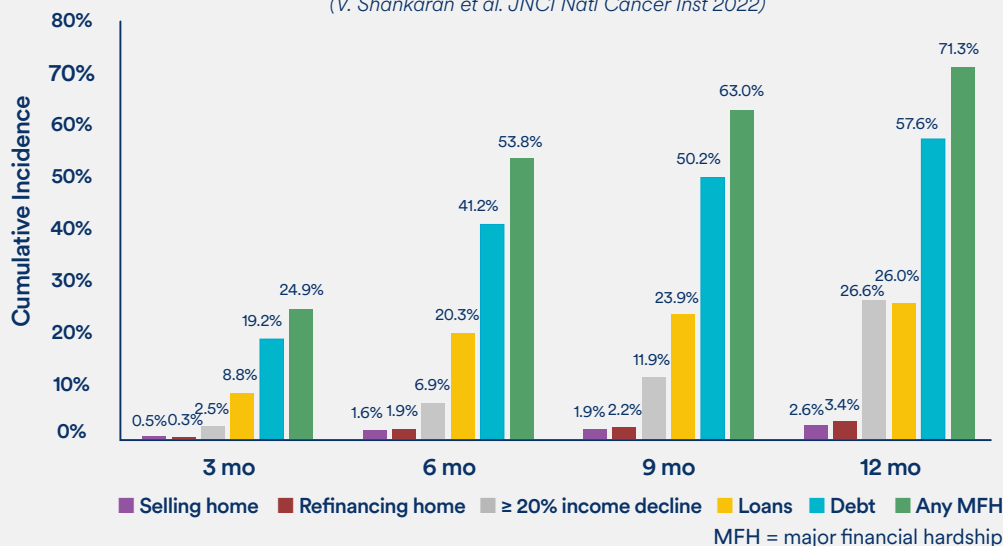
■ **Johnson KM, Jiao B, Bender MA, Ramsey SD, Devine B, Basu A.** Development of a conceptual model for evaluating new non-curative and curative therapies for sickle cell disease. *PLOS ONE*. 2022;17(4):e0267448. doi:10.1371/journal.pone.0267448

■ **Issaka RB, Bell-Brown A, Kao J, Snyder C, Atkins DL, Chew LD, Weiner BJ, Strate L, Inadomi JM, Ramsey SD.** Barriers associated with inadequate follow-up of abnormal fecal immunochemical test results in a safety-net system: A mixed-methods analysis. *Preventive Medicine Reports*. 2022;28:101831. doi:10.1016/j.pmedr.2022.101831

cash payments that could help patients avoid falling into severe financial distress following a cancer diagnosis. “The current economic situation has made it even harder for families to afford the cost of care,” said Dr. Shankaran. “It is critical that we take action now by testing methods and pushing for policy change that alleviates the financial distress experienced by patients and caregivers.”

Cumulative incidence of financial hardship

(V. Shankaran et al. *JNCI Natl Cancer Inst* 2022)



External Advisory Board



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Maria Lopes, M.D., M.S.

Payer Strategy: Chief Medical Officer of CDMI/Magellan



Peter Yu, M.D.

Physician-in-Chief, Hartford HealthCare Cancer Institute; Clinical Member, Memorial Sloan Kettering Cancer Center



Raymond Osarogiagbon, MBBS, F.A.C.P.

Chief Scientist for Baptist Memorial Health Care; Director of the Multidisciplinary Thoracic Oncology Program and the Thoracic Oncology Research (ThOR) Group at Baptist Cancer Center in Memphis, Tennessee

Hutchinson Institute for Cancer Outcomes Research Team



Back left to right: Chris Su, Shannon Kestner, Kaiyue Yu, Talor Hopkins, Natasha Kwendakwema, Morgan Glascock, Angie Madrid, Winona Wright, Lily Li

Front left to right: Kate Watabayashi, Carolyn Rutter, Erin Gillespie, Veena Shankaran, Rachel Issaka, Scott Ramsey, Karma Kreizenbeck, Kristy Drury, Catherine Fedorenko, Lisa Rose, Hiba Khan, Amanda Kimura, Sarah Miller

Not Pictured: Judy Nelson, Ari Bell-Brown, Eliza Cohn, Qin Sun, Chris Maerzluft, Lauren Shih, Stefan Allen, Aasthaa Bansal, Parth Shah, Christoph Lee, Janie Lee



Hutchinson Institute for Cancer Outcomes Research

To learn more, scan the QR code or visit FredHutch.org/HICOR