Can Distributional Cost Effectiveness Analysis (DCEA) Actually Inform and Improve Health Equity in Oncology?

Perspectives from a Methodologist, Payer, and Physician

ISPOR Atlanta, Tuesday May 7, 17:00 - 18:00

BAYER
PRECISIONheor
UCSF University of California San Francisco
Mass General Brigham Brigham and Women's Faulkner Hospital
HARVARD MEDICAL SCHOOL
Magellan HEALTH

Panel Experts

Speaker	Disclosures
Jamie Grossman, PhD (Discussion leader) Senior Director, Health Economics & Outcomes Research, Bayer	Employee of Bayer HealthCare Pharmaceuticals, Inc.
Jeroen Jansen, PhD Associate Professor, University of California, San Francisco Chief Scientist, PRECISIONheor	Stock options in Precision Medicine Group which conducted a DCEA study on behalf of Bayer
Quoc-Dien Trinh, MD, MBA Chief of Urology, Brigham and Women's Faulkner Hospital Harvard Medical School	Consulting fees from Astellas, Bayer, Intuitive Surgical, Janssen, Novartis, Pfizer, and research funding from the American Cancer Society, Pfizer Global Medical Grants (Prostate Cancer Disparities #63354905), and a Health Disparity Research Award from the Department of Defense Congressionally Directed Medical Research Program (#PC220551).
Maria Lopes, MD Former CMO, Magellan	Payer advisor to Bayer as well as other Pharmaceutical and biotech companies.

DCEA, distributional cost-effectiveness analysis

Session Outline

Key Question:	Can distributional cost-effectiveness analysis (DCEA) **actually inform and improve health equity** in oncology?

Session:	Speaker	Timing
• Introduction: Health Equity in Oncology	Jamie Grossman	5 min
• Quantify Health Equity Impact with DCEA	Jeroen Jansen	15 min
• Health Equity Perspectives from a Payer	Maria Lopes	10 min
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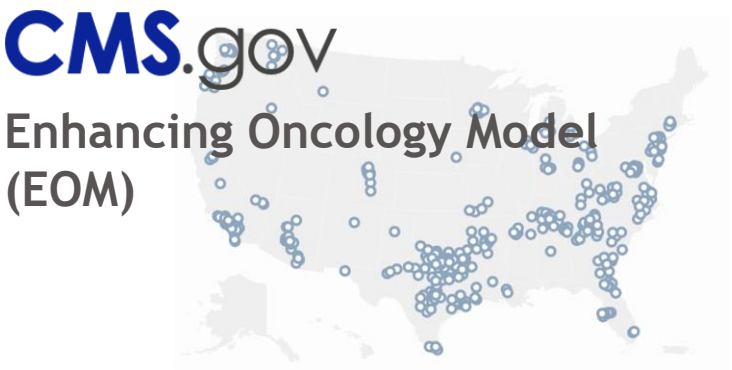
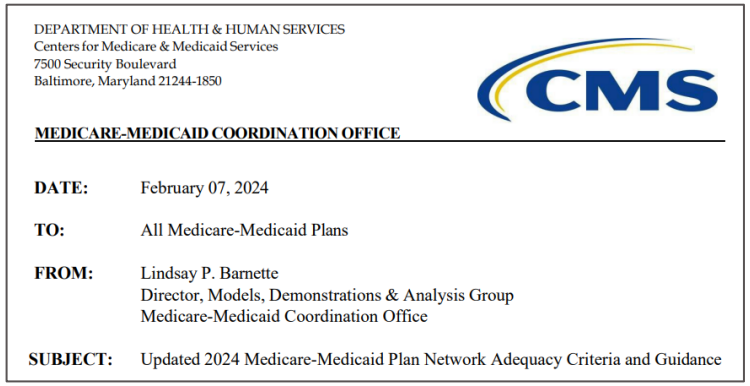
There is growing recognition of health equity concerns and the importance of social determinants of health





DEPARTMENT OF HEALTH & HUMAN SERVICES
Centers for Medicare & Medicaid Services
7500 Security Boulevard
Baltimore, Maryland 21244-1850

CMS

MEDICARE-MEDICAID COORDINATION OFFICE

DATE: February 07, 2024

TO: All Medicare-Medicaid Plans

FROM: Lindsay P. Barnette
Director, Models, Demonstrations & Analysis Group
Medicare-Medicaid Coordination Office

SUBJECT: Updated 2024 Medicare-Medicaid Plan Network Adequacy Criteria and Guidance

Among 5 Overarching Goals:[1]

"Eliminate health disparities, achieve health equity, and attain health literacy to improve the health and well-being of all."

A key priority and focus of EOM:[2]

"Observe improved care quality, ***health equity,*** and health outcomes as well as achieve savings over the course of the model test."

CMS HEI program commenced:[3]

Baselining year initiated 1/1/2024 for HEI informing 2027 ***Star Rating bonus calculations*** for Medicare Advantage and Part D reimbursement.

1) Healthy People 2030 Framework, U.S. Department of Health and Human Services, U.S. Department of Disease Prevention and Health Promotion. Accessed 24 April 2024 https://health.gov/healthypeople/about/healthy-people-2030-framework
2) Enhancing Oncology Model, Centers for Medicare & Medicaid Services. Accessed 24 April 2024. https://www.cms.gov/priorities/innovation/innovation-models/enhancing-oncology-model
3) 2025 Medicare Advantage and Part D Final Rule (CMS-4201-F), Centers for Medicare & Medicaid Services. Accessed 24 April 2024. https://www.cms.gov/newsroom/fact-sheets/2024-medicare-advantage-and-part-d-final-rule-cms-4201-f
4) Updated 2024 Medicare-Medicaid Plan Network Adequacy Criteria and Guidance, Department of Health and Human Services, Centers for Medicare & Medicaid Services. Accessed 24 April 2024. https://www.cms.gov/files/document/mmphsdnetworksubmissionguidancememocy2024.pdf

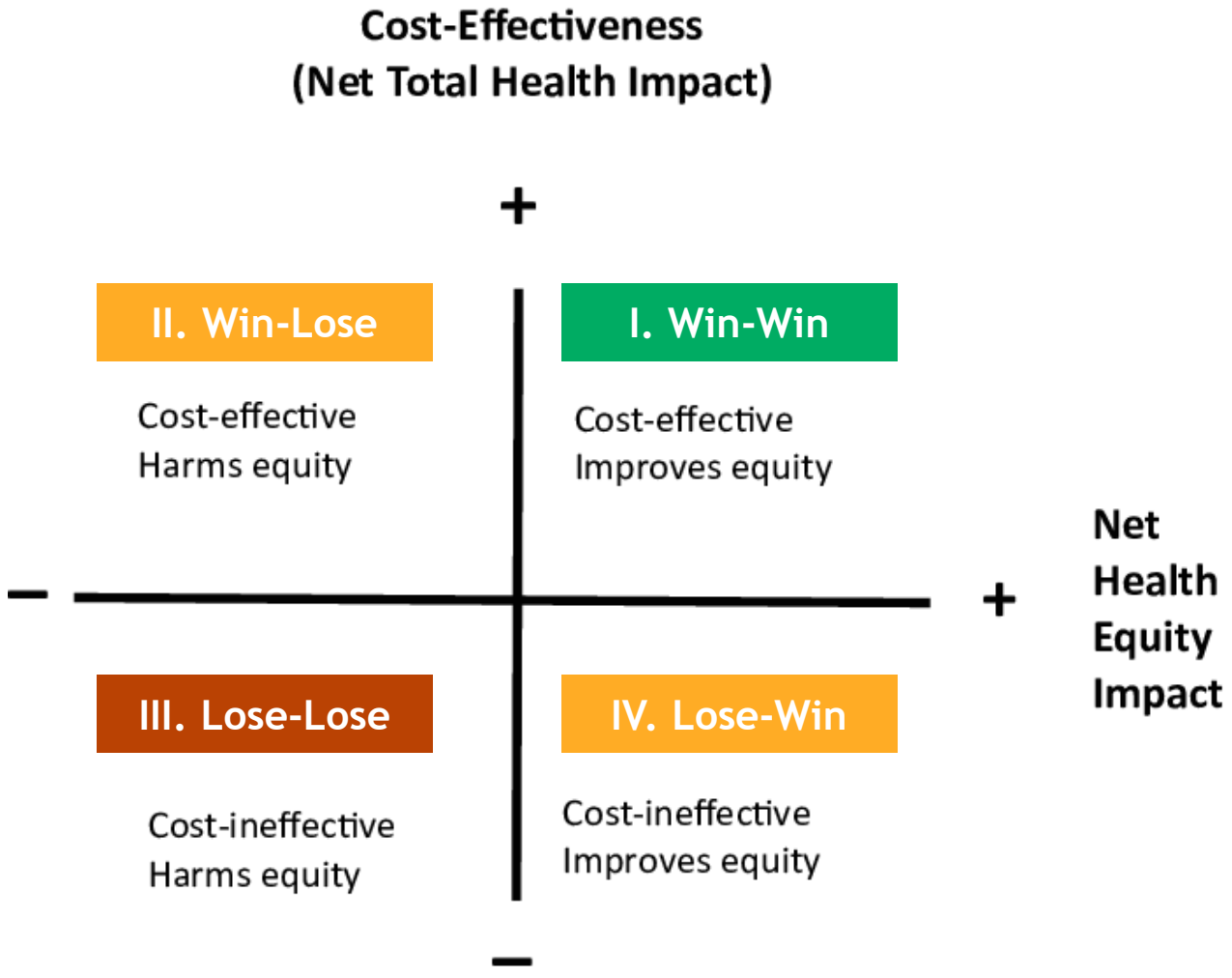
Key definitions

- **Health inequality** ("differences")
  - Refers to an explicit quantification of how **dissimilar** health outcomes are between groups
  - Does not involve any moral judgment on whether differences are fair or just
- **Health disparity**
  - "A particular type of health difference that is closely **linked with social, economic, and/or environmental disadvantage**" – Healthy People 2020
  - **Plausibly avoidable**, systematic health differences adversely affecting economically or socially disadvantaged groups[1]
- **Health equity**
  - The absence of **unfair avoidable or remediable differences** in health among population groups defined socially, economically, demographically, or geographically[2]
  - The fair and just opportunity for everyone to be as healthy as possible[1]

1) Braveman P, Arkin E, Orleans T, Proctor D, Plough A. What Is Health Equity? And What Difference Does a Definition Make? Robert Wood Johnson Foundation; 2017.

2) Arcaya MC, Arcaya AL, Subramanian SV. Inequalities in health: definitions, concepts, and theories. Glob Health Action. 2015;8:27106.

Quantification of health equity impacts and trade-offs with DCEA



Cookson et al. Using cost-effectiveness analysis to address health equity concerns. Value in Health. 2017;20(2):206-12.

Effect of social determinants of health and care access on cancer mortality

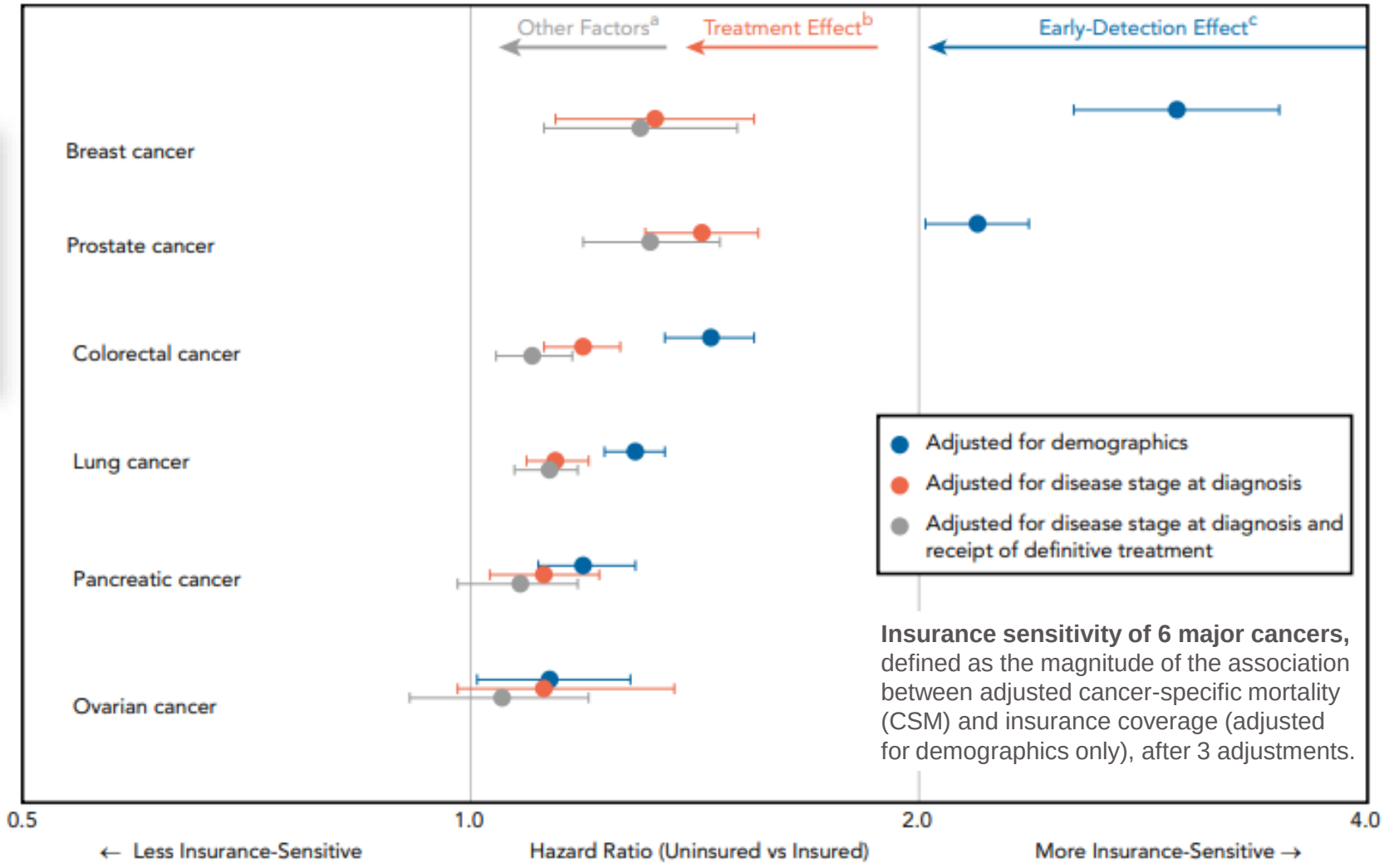
ORIGINAL RESEARCH

Comparing the Association Between Insurance and Mortality in Ovarian, Pancreatic, Lung, Colorectal, Prostate, and Breast Cancers

Alexander P. Cole, MD[a,b]; Chang Lu, MS[a,b]; Marieke J. Krimphove, MD[c]; Julie Szymaniak, MD[a]; Maxine Sun, PhD, MPH[d]; Sean A. Fletcher, MD[a,b]; Stuart R. Lipsitz, ScD[b,e]; Brandon A. Mahal, MD[f]; Paul L. Nguyen, MD[f]; Toni K. Choueiri, MD[d]; Adam S. Kibel, MD[a]; Adil H. Haider, MD[b,g]; and Quoc-Dien Trinh, MD[a,b]

Cancer-specific mortality affected by:

- Insurance coverage status
- Stage at diagnosis (screening effect)
- Definitive therapy (treatment effect)



Insurance sensitivity of 6 major cancers, defined as the magnitude of the association between adjusted cancer-specific mortality (CSM) and insurance coverage (adjusted for demographics only), after 3 adjustments.

Cole AP et al. J Natl Compr Canc Netw 2019;17(9):1049–1058. doi: 10.6004/jnccn.2019.7296

Example of health disparities in prostate cancer

Prostate Cancer and Prostatic Diseases (2019) 22:125–136
https://doi.org/10.1038/s41391-018-0083-4

ARTICLE

Clinical Research

Evaluation of the contribution of demographics, access to health care, treatment, and tumor characteristics to racial differences in survival of advanced prostate cancer

Marieke J. Krimphove[1,2] · Alexander P. Cole[1] · Sean A. Fletcher[1] · Sabrina S. Harmouch[1] · Sebastian Berg[1,3] · Stuart R. Lipsitz[4] · Maxine Sun[1,5] · Junaid Nabi[1] · Paul L. Nguyen[6] · Jim C. Hu[7] · Adam S. Kibel[1] · Toni K. Choueiri[5] · Luis A. Kluth[2] · Quoc-Dien Trinh[1]

- African Americans shown to have
  - Greater disease risk
  - Higher morbidity
  - Higher mortality
- BUT <u>better outcomes</u> given
  - Choice of therapy
  - Equitable access
  - Support programs

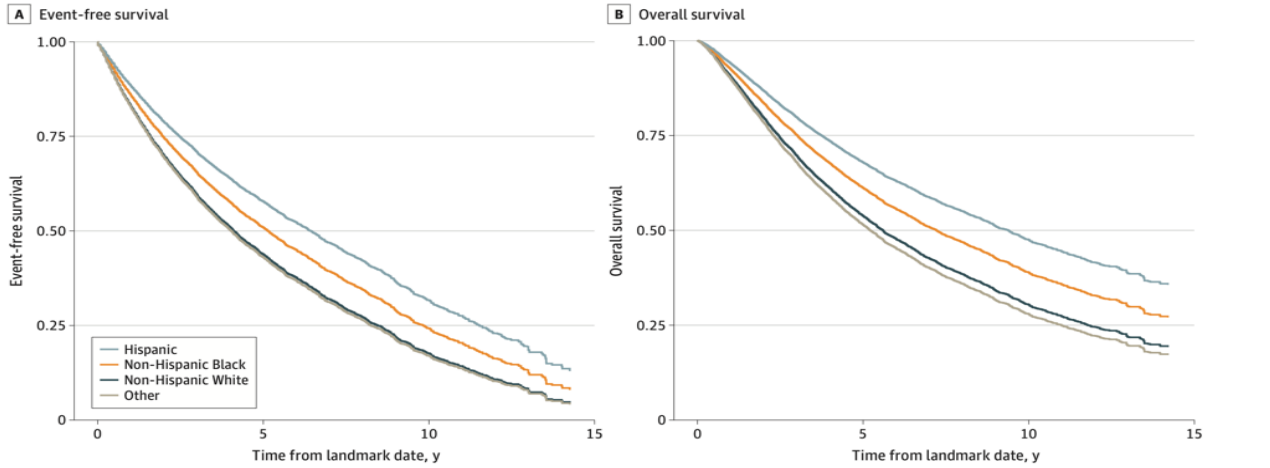
JAMA Network Open

Original Investigation | Oncology

Survival Outcomes by Race and Ethnicity in Veterans With Nonmetastatic Castration-Resistant Prostate Cancer

Kelli M. Rasmussen, MS; Vikas Patil, MS; Chunyang Li, PhD; Christina Yong, MA; Sreevalsa Appukkuttan, MBBS, MPH; Jamie Partridge Grossman, PhD, MBA; Jay Jhaveri, MD, MPH; Ahmad S. Halwani, MD

Figure 2. Adjusted Survival Curves for Survival by Race and Ethnicity



Metastasis-free (A) and overall (B) survival. The numbers at risk are not available for adjusted survival curves, because the survival curves are adjusted proportionally with the confounders. The original numbers at risk would not correctly reflect the curves. The same algorithm we used to create survival curves does not provide numbers at risk, because the scaling is working on survival probabilities. To our knowledge, there are no existing algorithms to scale the number of people in such cases. Other includes American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, unknown by patient, and patient declined to answer.

1) Krimphove, M.J., Cole, A.P., Fletcher, S.A. et al. Prostate Cancer Prostatic Dis 22, 125–136 (2019).
2) Rasmussen KM, Patil V, Li C, et al. JAMA Netw Open. 2023;6(10):e2337272

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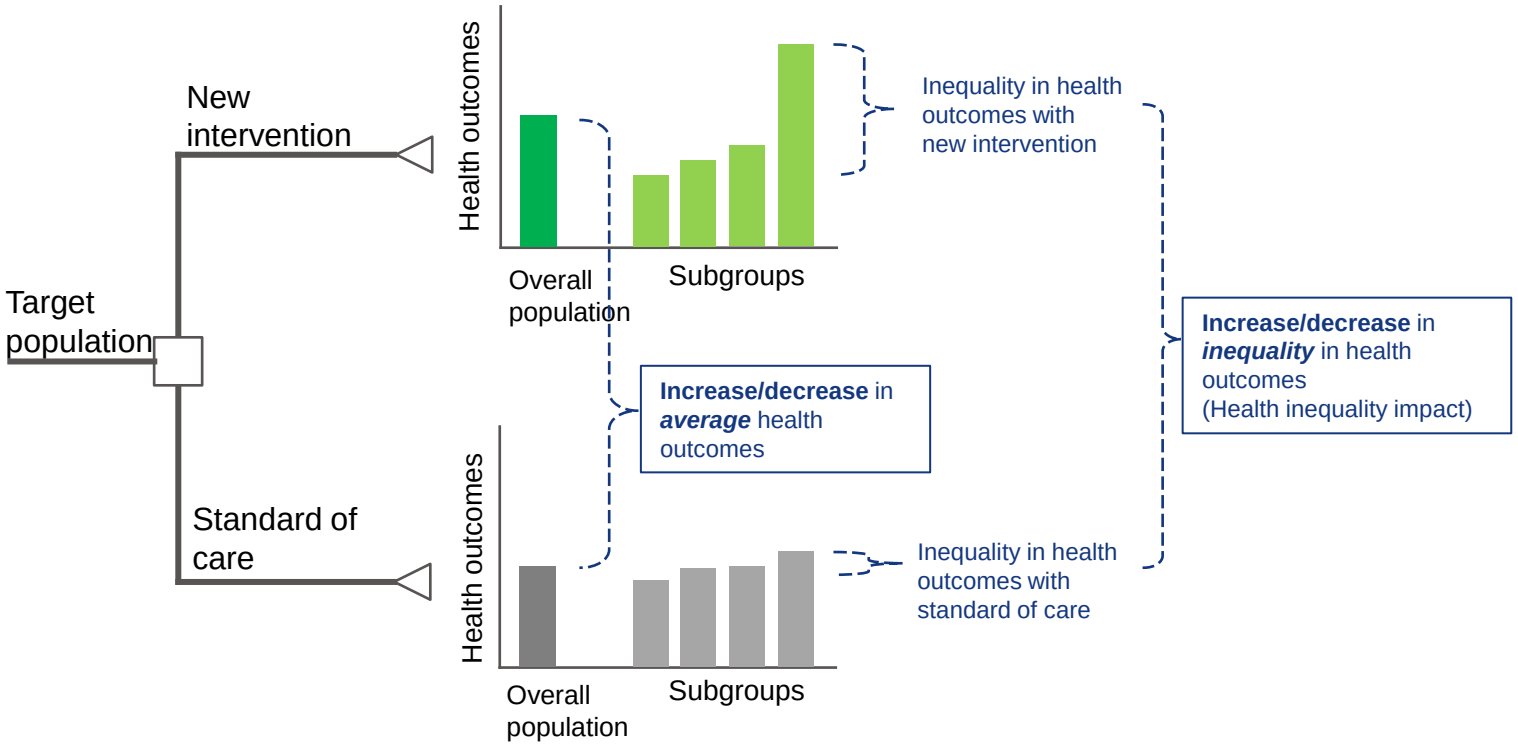
University of California
San Francisco

PRECISIONheor

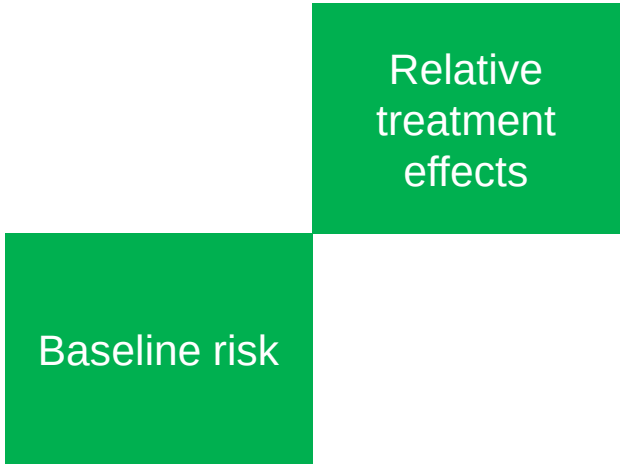
Quantify health equity impact with distributional cost-effectiveness analysis

Jeroen Jansen, PhD

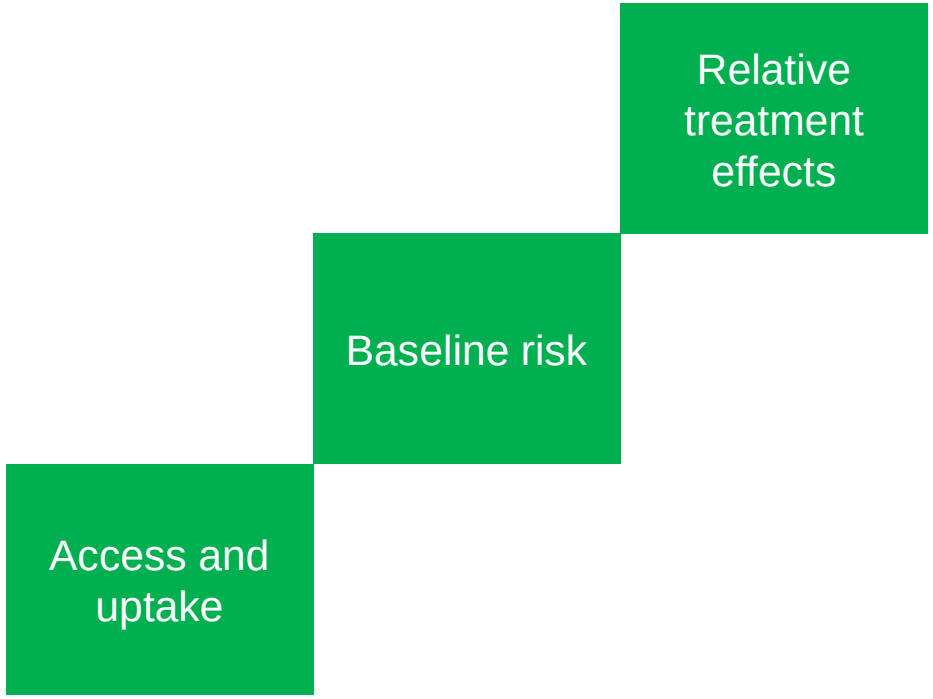
Compare distributions of health outcomes in terms of total health and inequality



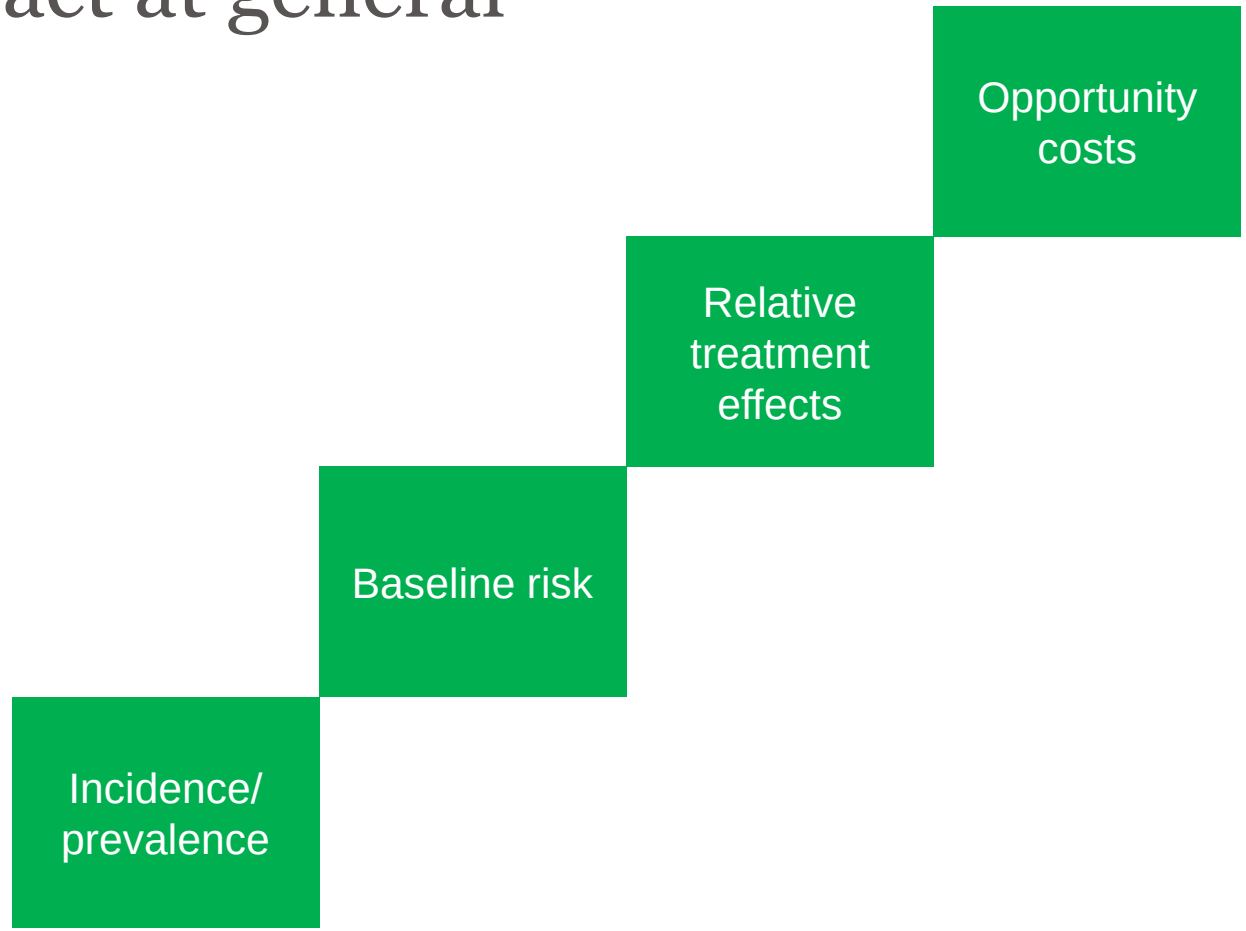
Health inequality impact in target patient population



Health inequality impact in target patient population with access and uptake

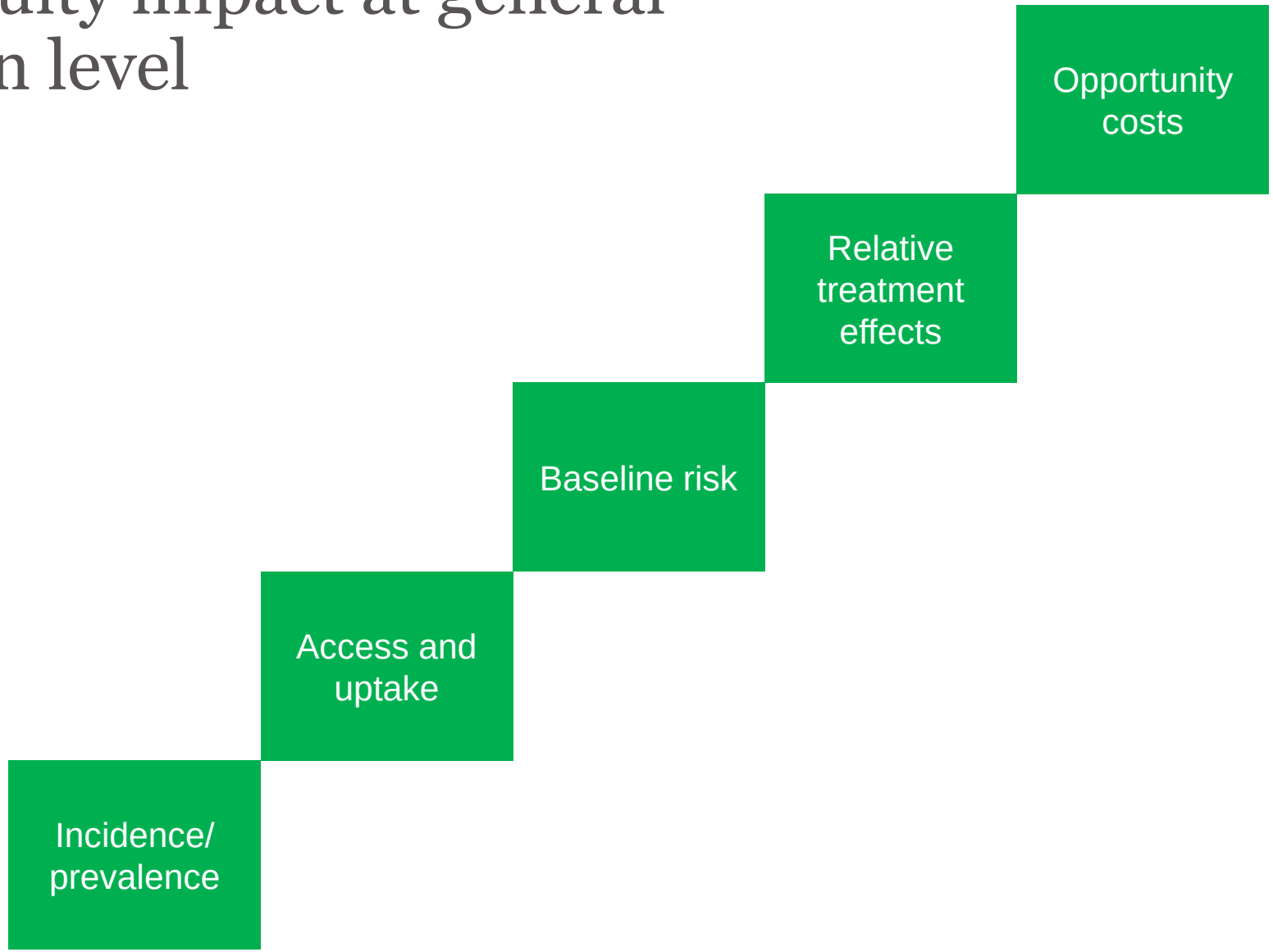


Health equity impact at general population level



Asaria et al.. Distributional cost-effectiveness analysis: a tutorial. Medical Decision Making. 2016;36(1):8-19.
Cookson et al.. Using cost-effectiveness analysis to address health equity concerns. Value in Health. 2017;20(2):206-12.

Health equity impact at general population level



Asaria et al.. Distributional cost-effectiveness analysis: a tutorial. Medical Decision Making. 2016;36(1):8-19.
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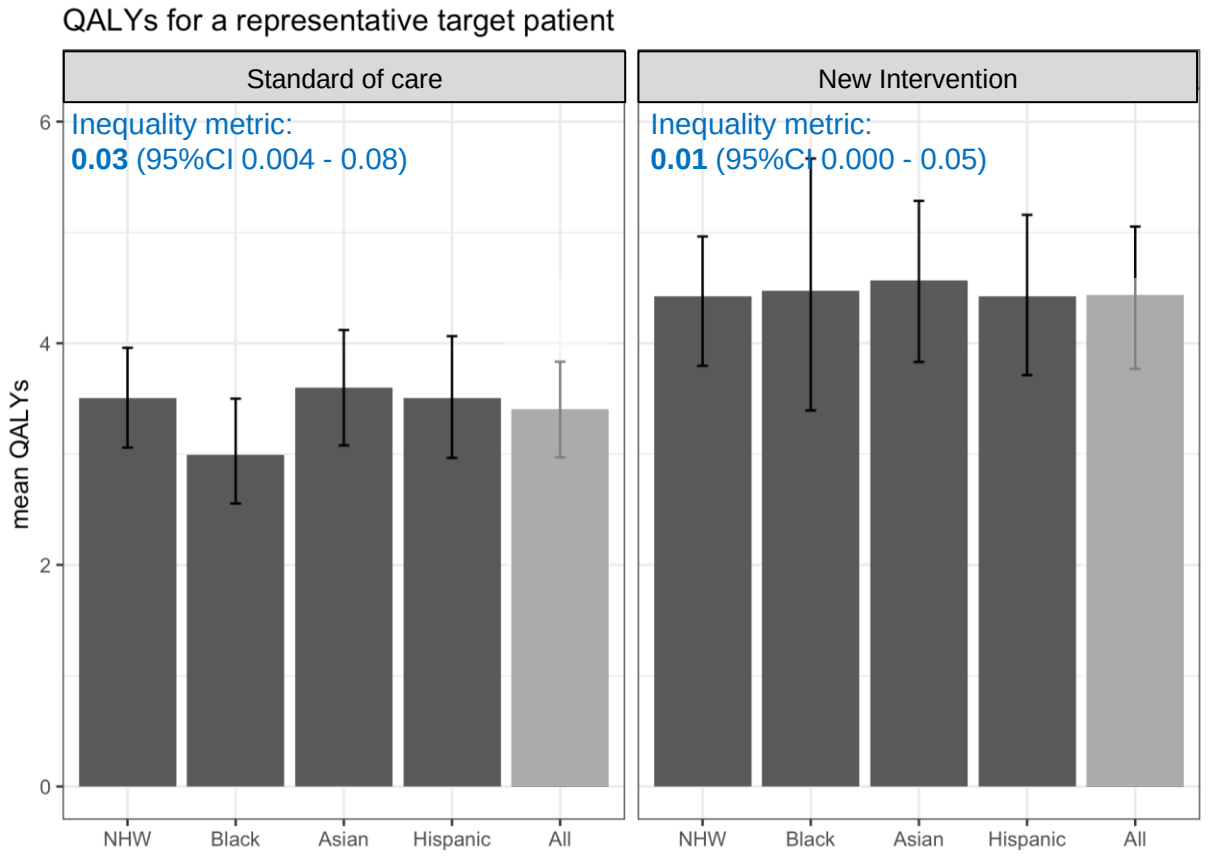
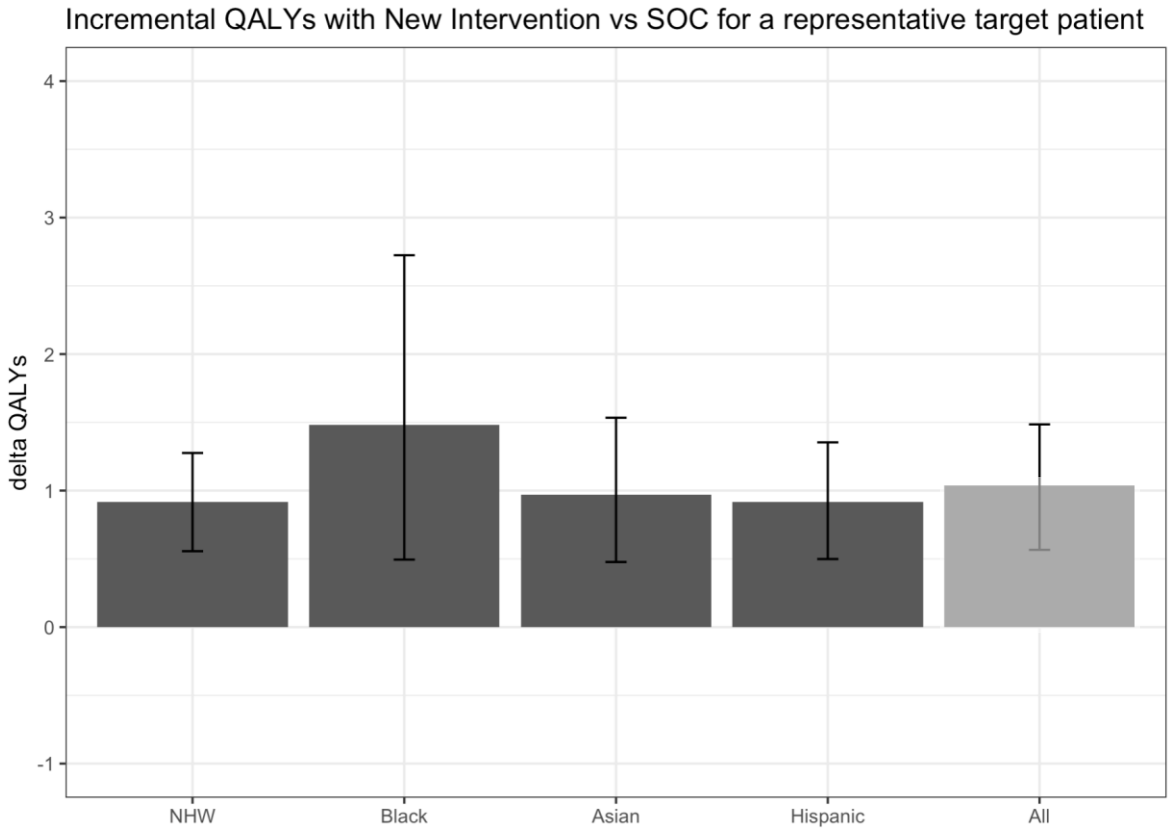
Example – Expected QALYs by target patient



Example – Incremental QALYs by target patient



Example – Other information needed for DCEA

- In a conventional CEA we calculate the incremental net health benefit of the New Intervention relative to SOC:

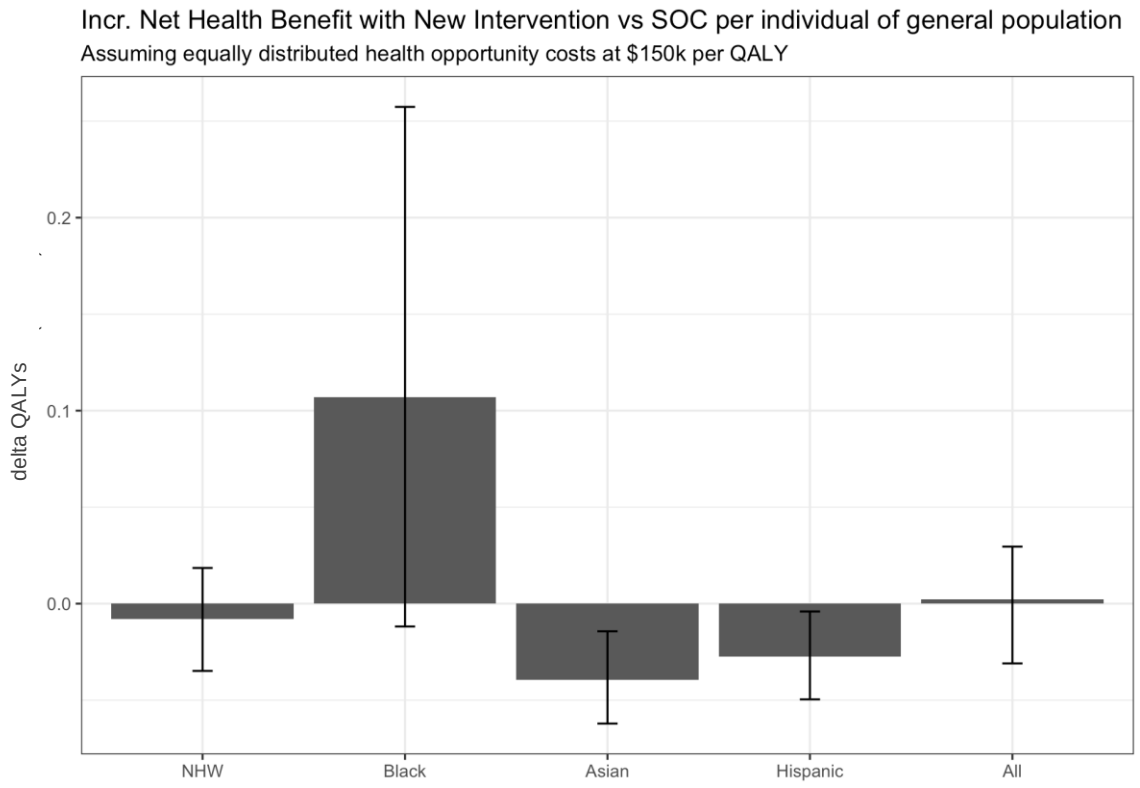
$$\Delta NHB = \Delta QALY - \frac{\Delta COST}{ce\_treshold}$$

e.g., if the incremental costs of the New Intervention are just below the CE-threshold, we lose almost 1 QALY "somewhere else" for every patient treated with the New Intervention instead of SOC.

- In a DCEA we do the same, but we need to capture how the QALYs gained and QALYs lost (health opportunity cost) are distributed over society. As such, we need the following information in addition:

	NH-White	NH-Black	Asian	Hispanic
Proportion in general population	0.606	0.139	0.062	0.193
Lifetime probability of the disease	8.8%	13.5%	5.0%	6.7%
Quality adjusted life-expectancy at birth (QALE)	68.798	65.446	74.878	71.762

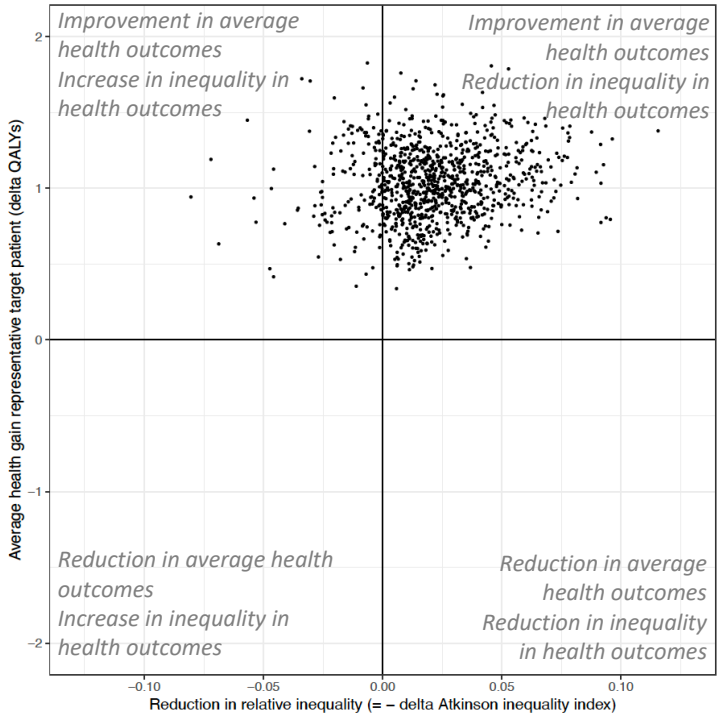
Example – Incremental Net Health Benefit



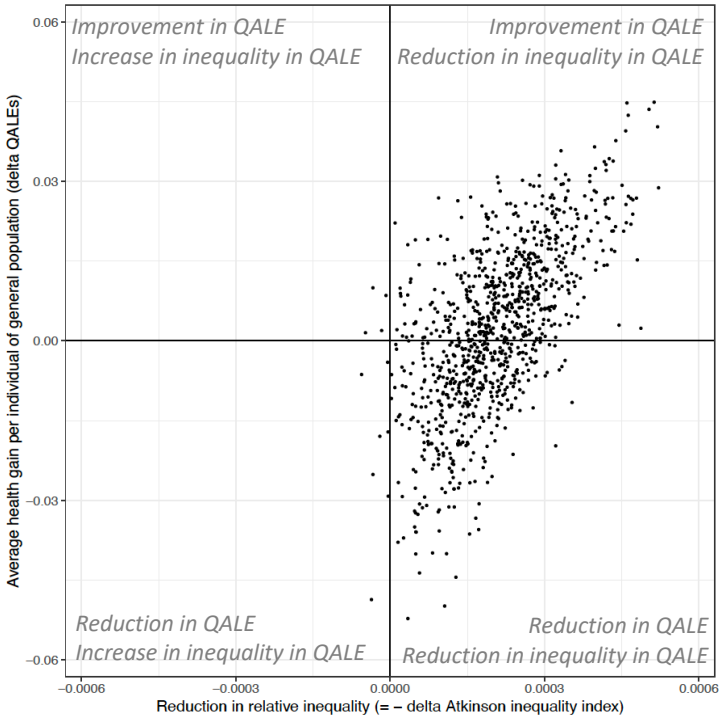
	Pre New Intervention	Post New Intervention
NH-White	68.798	68.790 (68.763 - 68.816)
NH-Black	65.446	65.553 (65.435 - 65.704)
Asian	74.878	74.839 (74.816 - 74.864)
Hispanic	71.762	71.735 (71.712 - 71.758)
All	69.283	69.286 (69.252 - 69.313)
Inequality metric	**5.80 E-03**	**5.60 E-03** (5.37 E-03 – 5.78 E-03)

Example – Total gain in health vs. health inequality

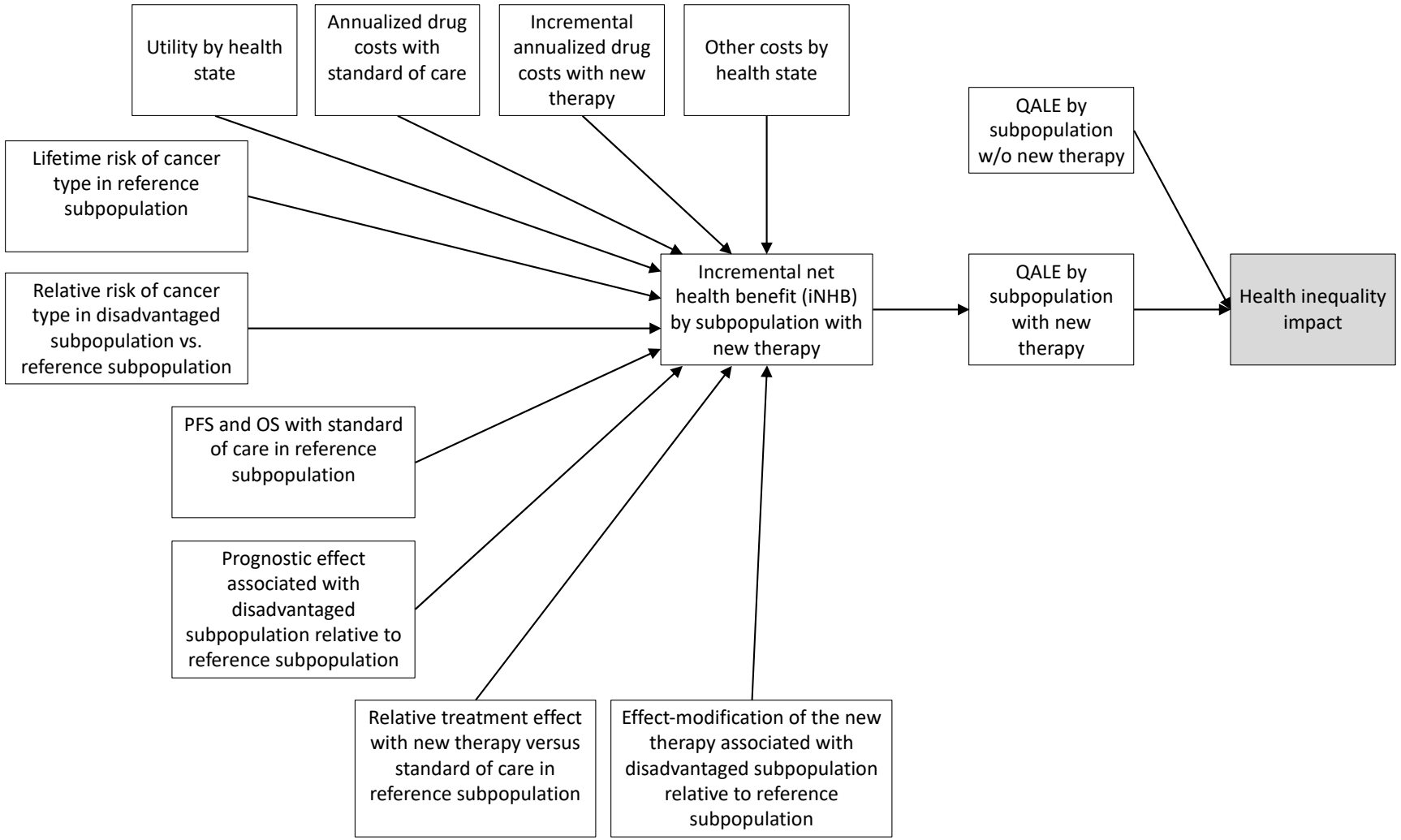
Target patient population



General population

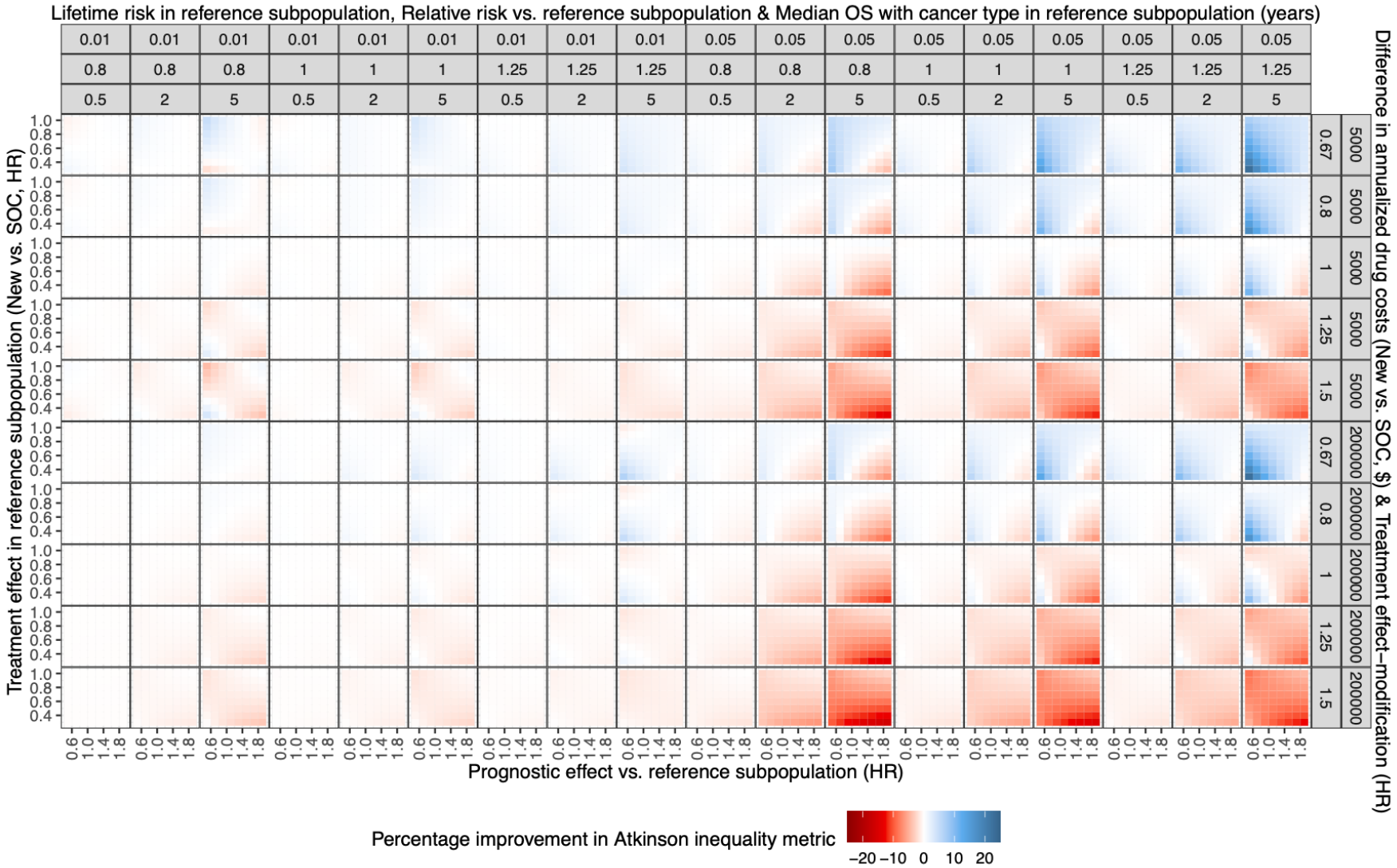


Variables impacting health inequality impact



Jansen JP, Brewer IP, Chung S, Sullivan P, Espinosa OD, Grossman JP. The Health Inequality Impact of a New Cancer Therapy Given Treatment and Disease Characteristics. Value Health. 2023 Nov 10:S1098-3015(23)06191-0

Health inequality impact as function of disease and treatment characteristics



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Summary

- With a renewed and keener scrutiny of health equity issues, the distributional consequences of a new intervention across subgroups should come to the forefront of discussions about value in health
- DCEA is an intuitively appealing extension of conventional CEA to quantify health equity impact
- With a DCEA, the impact of competing interventions on different subgroups are estimated and the distributions of the health outcomes, taking into consideration the opportunity costs, are compared in terms of average health and health inequality
- Gaps in the evidence base do not automatically render DCEA moot, futile, or vacuous
- Without a DCEA the potential positive or negative health equity impact of a new health technology is unclear.

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Can Distributional Cost Effectiveness Analysis (DCEA) Actually Inform and Improve Health Equity in Oncology?

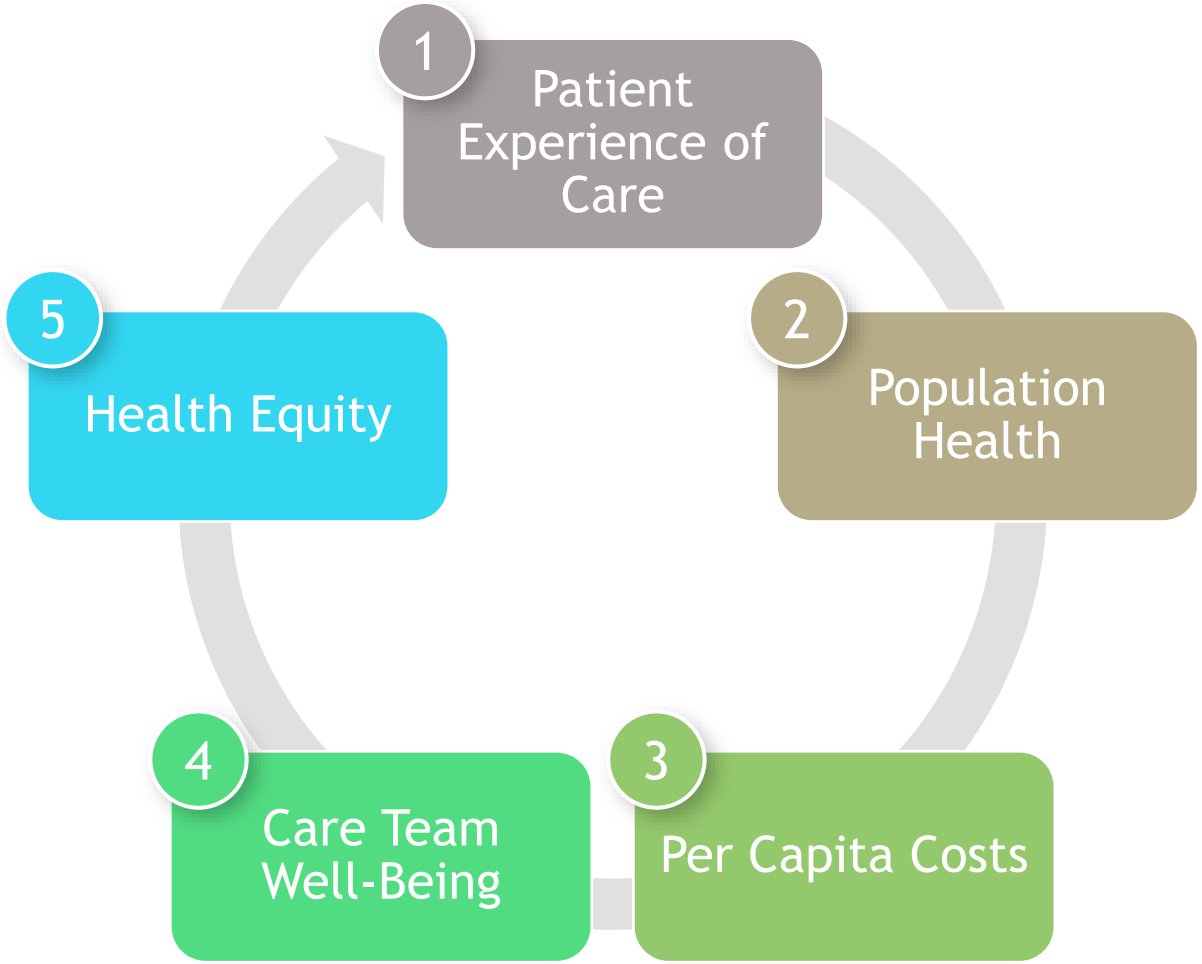
Health Equity Perspectives from a Payer

Maria Lopes, MD, MS

ISPOR Atlanta, Tuesday May 7, 17:00 - 18:00

Health equity is of increasing importance for payers and HTA

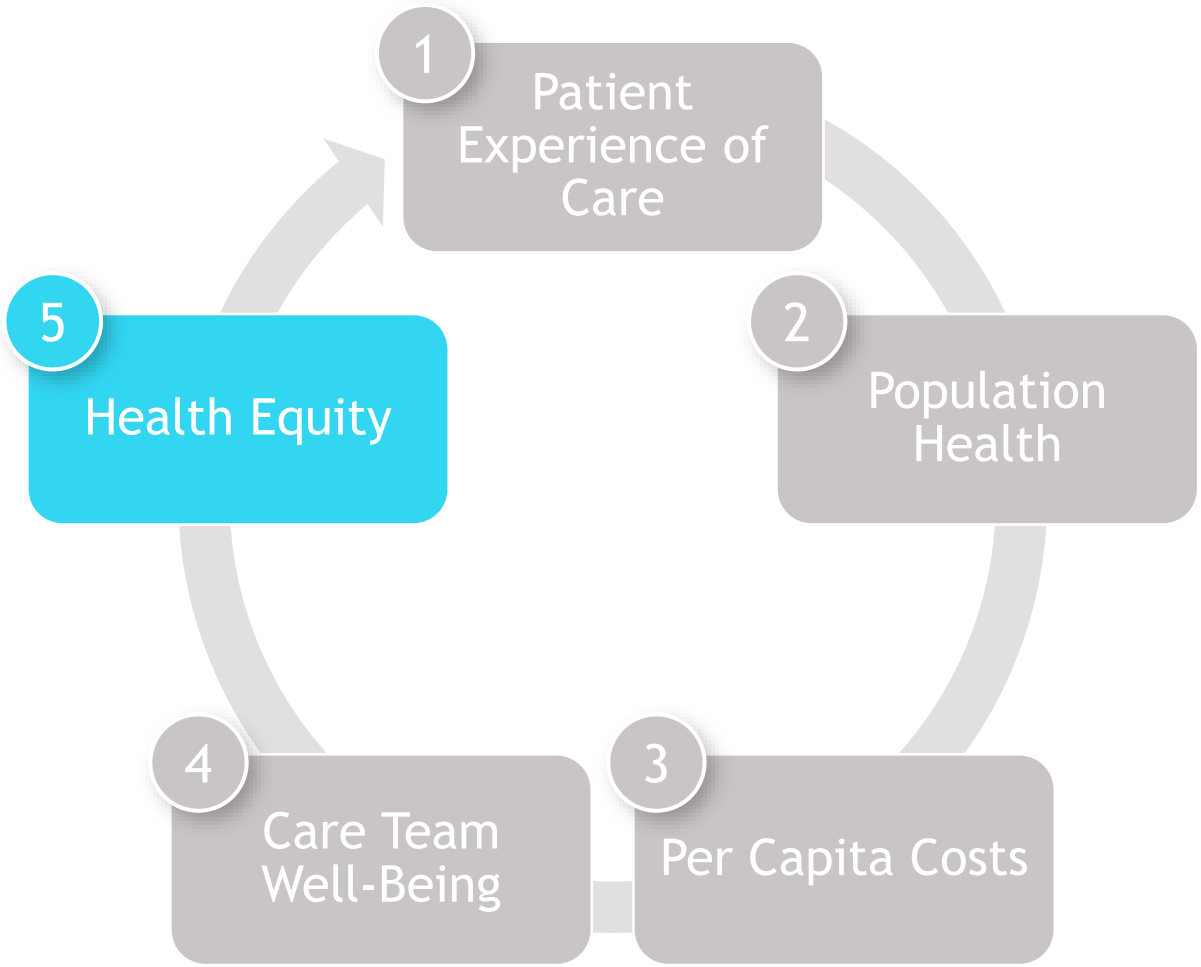
- In 2007, the Institute for Healthcare Improvement introduced the **Triple Aim**:
  1. improved patient experience
  2. better population health outcomes
  3. lower per capita cost
- In 2014, the concept evolved to the **Quadruple Aim** to incorporate
  4. clinician team well-being
- Today, the concept has further advanced to the **Quintuple Aim** to incorporate
  5. health equity



Nundy S, Cooper LA, Mate KS. The Quintuple Aim for Health Care Improvement: A New Imperative to Advance Health Equity. JAMA. 2022;327(6):521–522. doi:10.1001/jama.2021.25181

Health equity within the Quintuple Aim

- **Health equity is of increasing importance** to payers especially in areas of preventative care, screening and overall patient engagement
- **Addressing health equity requires action** from healthcare leaders and practitioners
  - Identify disparities
  - Design and implement evidence-based interventions to reduce disparities
  - Invest in equity measurement
  - Incentivize the achievement of equity



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Health equity within Healthy People 2030

Among 5 Overarching Goals:

"Eliminate health disparities, achieve health equity, and attain health literacy to improve the health and well-being of all."

- Healthy People 2030 identifies public health priorities to help individuals, organizations, and communities across the US to improve health and well-being.
- Emphasis on health equity is closely tied to the focus on health literacy and social determinants of health.
- Social determinants, when not appropriately accounted for, can contribute to health disparities.

Taking steps to address these factors is key to achieving health equity.

Healthy People 2030 Framework, U.S. Department of Health and Human Services, U.S. Department of Disease Prevention and Health Promotion. Accessed 24 April 2024 https://health.gov/healthypeople/about/healthy-people-2030-framework

Importance of social determinants of health (SDOH) for payers

Among 5 Overarching Goals:

"Eliminate health disparities, achieve health equity, and attain health literacy to improve the health and well-being of all."

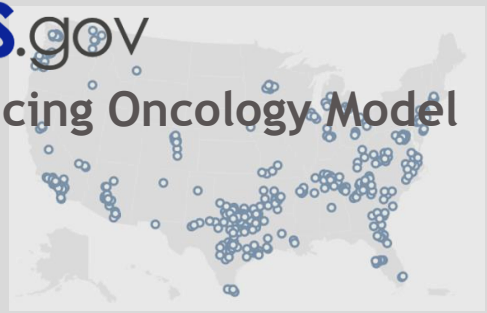
- SDOH are many:
  - Race/ethnicity
  - distance from health care facility
  - Food insecurity
  - Language barriers, etc.
- Key to meet people where they are and do a better job with patient education, screening, identification, and treatment
- Imperative to increase consumer engagement by bringing services into the community to increase awareness and trust
  - Be available at places of worship, barbershops
  - Arrange transportation to bring either the patient to healthcare or healthcare to the patient

Healthy People 2030 Framework, U.S. Department of Health and Human Services, U.S. Department of Disease Prevention and Health Promotion. Accessed 24 April 2024 https://health.gov/healthypeople/about/healthy-people-2030-framework

Health equity within CMS Innovation Center Programs

CMS.gov

Enhancing Oncology Model (EOM)



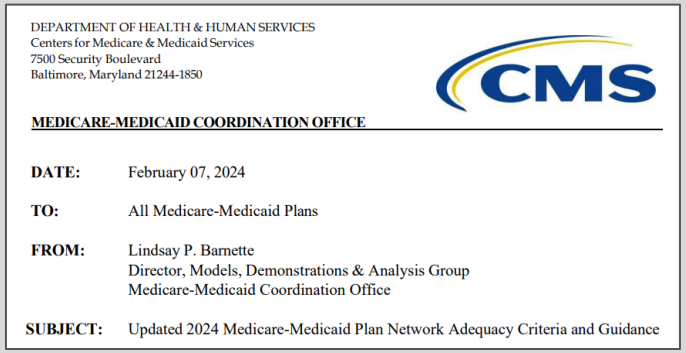
A key priority and focus of EOM:

"Observe improved care quality, ***health equity,*** and health outcomes as well as achieve savings over the course of the model test."

- EOM focuses on value-based, patient-centered care for cancer patients undergoing therapy based on 6-month episodes of care, with a specific focus on health equity.
- EOM participants are required to implement practice redesign and care enhancement i.e.,
  - 24/7 access to care
  - Patient navigation
  - Care planning
  - Use of evidence-based guidelines
  - Use of electronic Patient Reported Outcomes (ePROs)
  - Screening for health-related social needs
  - Use of data for quality improvement
  - Use of certified electronic health record technology
- As part of the "use of data for quality improvement", participants will submit to CMS health equity plans detailing evidence-based strategies to mitigate health disparities within their populations.

Enhancing Oncology Model, Centers for Medicare & Medicaid Services. Accessed 24 April 2024. https://www.cms.gov/priorities/innovation/innovation-models/enhancing-oncology-model

Health equity impact on Medicare Star Ratings



DEPARTMENT OF HEALTH & HUMAN SERVICES
Centers for Medicare & Medicaid Services
7500 Security Boulevard
Baltimore, Maryland 21244-1850

CMS

MEDICARE-MEDICAID COORDINATION OFFICE

DATE: February 07, 2024

TO: All Medicare-Medicaid Plans

FROM: Lindsay P. Barnette
Director, Models, Demonstrations & Analysis Group
Medicare-Medicaid Coordination Office

SUBJECT: Updated 2024 Medicare-Medicaid Plan Network Adequacy Criteria and Guidance

CMS HEI program commenced:

Baselining year initiated 1/1/2024 for HEI informing 2027 ***Star Rating bonus calculations*** for Medicare Advantage and Part D reimbursement.

- CMS is modifying the Star Ratings rewards system to incorporate a health equity focus.
- The new emphasis features a health equity index, which rewards contracts for improving care for populations with social risk factors (i.e., low income/dually-eligible status, disability).
- This initiative goes into effect starting with 2027 Star Ratings (2028 payment year), which will be based on data from 2024 and 2025.

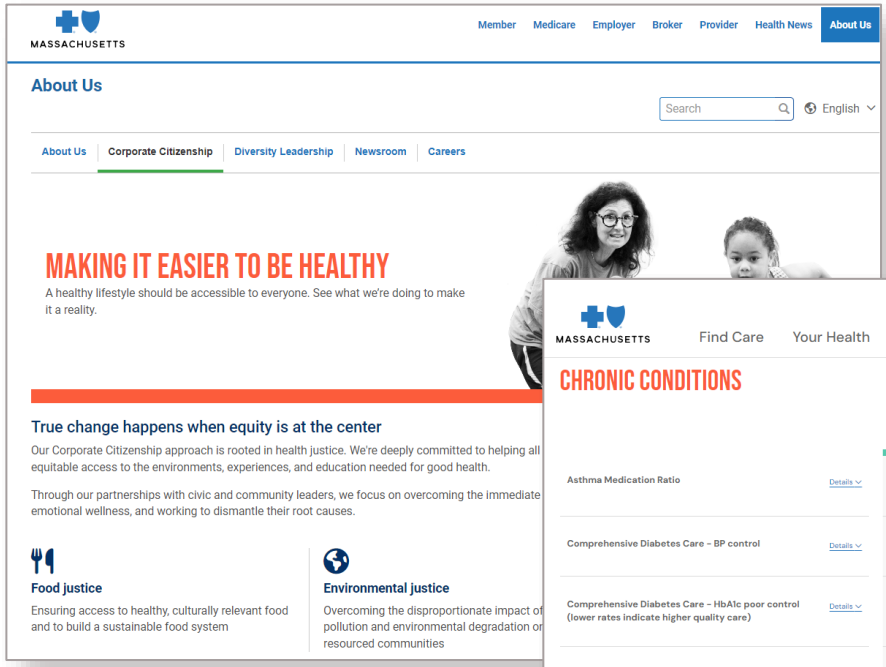
5 measure groups historically:

1) Mortality
2) Safety of Care
3) Readmission
4) Patient Experience
5) Timely & Effective Care

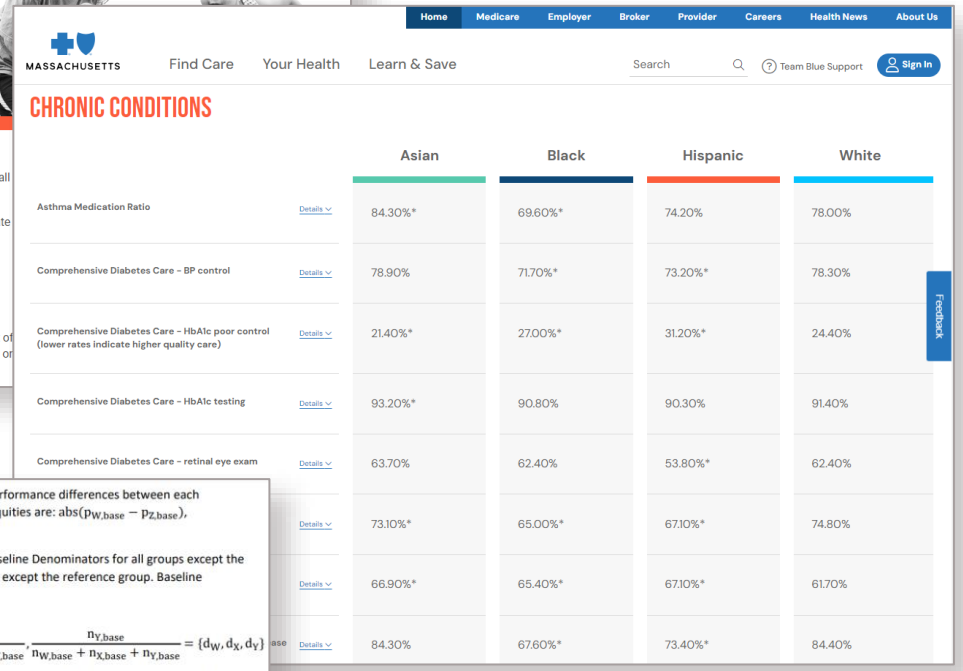
Updated 2024 Medicare-Medicaid Plan Network Adequacy Criteria and Guidance, Department of Health and Human Services, Centers for Medicare & Medicaid Services. Accessed 24 April 2024. https://www.cms.gov/files/document/mmphsdnetworksubmissionguidancememocy2024.pdf

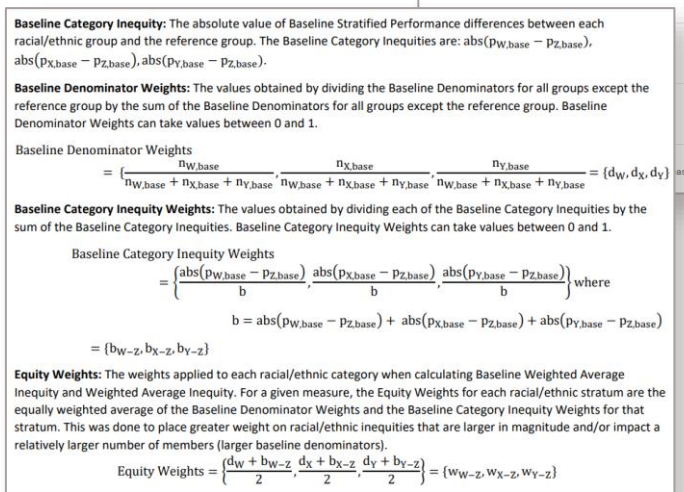
BCBS Massachusetts: pay for equity contracts

- Ensure high-value, high-quality, equitable care for 2.9+ million members.
- First payer to create payment contracts with financial incentives for improving health equity (reducing racial/ethnic inequities in care)
- Partnering with 4 of the state's largest health care systems:
  1) Steward Healthcare Network
  2) Beth Israel Lahey Health
  3) Mass General Brigham Health
  4) Boston Accountable Care Organization, Inc.
- Builds on the innovative Alternative Quality Contract model (quality over quantity) legacy.



Equity Report on Quality Measures





Baseline Category Inequity: The absolute value of Baseline Stratified Performance differences between each racial/ethnic group and the reference group. The Baseline Category Inequities are: $\text{abs}(p_{W,base} - p_{Z,base})$, $\text{abs}(p_{X,base} - p_{Z,base})$, $\text{abs}(p_{Y,base} - p_{Z,base})$.

Baseline Denominator Weights: The values obtained by dividing the Baseline Denominators for all groups except the reference group by the sum of the Baseline Denominators for all groups except the reference group. Baseline Denominator Weights can take values between 0 and 1.

$$\text{Baseline Denominator Weights} = \left\{\frac{n_{W,base}}{n_{W,base}+n_{X,base}+n_{Y,base}}, \frac{n_{X,base}}{n_{W,base}+n_{X,base}+n_{Y,base}}, \frac{n_{Y,base}}{n_{W,base}+n_{X,base}+n_{Y,base}}\right\} = \{d_W, d_X, d_Y\}$$

Baseline Category Inequity Weights: The values obtained by dividing each of the Baseline Category Inequities by the sum of the Baseline Category Inequities. Baseline Category Inequity Weights can take values between 0 and 1.

$$\text{Baseline Category Inequity Weights} = \left\{\frac{\text{abs}(p_{W,base} - p_{Z,base})}{b}, \frac{\text{abs}(p_{X,base} - p_{Z,base})}{b}, \frac{\text{abs}(p_{Y,base} - p_{Z,base})}{b}\right\} \text{ where}$$

$$b = \text{abs}(p_{W,base} - p_{Z,base}) + \text{abs}(p_{X,base} - p_{Z,base}) + \text{abs}(p_{Y,base} - p_{Z,base})$$

$$= \{b_{W-Z}, b_{X-Z}, b_{Y-Z}\}$$

Equity Weights: The weights applied to each racial/ethnic category when calculating Baseline Weighted Average Inequity and Weighted Average Inequity. For a given measure, the Equity Weights for each racial/ethnic stratum are the equally weighted average of the Baseline Denominator Weights and the Baseline Category Inequity Weights for that stratum. This was done to place greater weight on racial/ethnic inequities that are larger in magnitude and/or impact a relatively larger number of members (larger baseline denominators).

$$\text{Equity Weights} = \left\{\frac{d_W + b_{W-Z}}{2}, \frac{d_X + b_{X-Z}}{2}, \frac{d_Y + b_{Y-Z}}{2}\right\} = \{w_{W-Z}, w_{X-Z}, w_{Y-Z}\}$$

Payment contract health equity calculations methodology

Equity in Health Care, Blue Cross Blue Shield Massachusetts. Accessed 26 April 2024. https://www.bluecrossma.org/myblue/equity-in-health-care

Session Outline

Key Question: Can distributional cost-effectiveness analysis (DCEA) **actually inform and improve health equity** in oncology?

Session:	Speaker	Timing
• **Introduction: Health Equity in Oncology**	**Jamie Grossman**	**5 min**
• Quantify Health Equity Impact with DCEA	Jeroen Jansen	15 min
• Health Equity Perspectives from a Payer	Maria Lopes	10 min
• **Health Equity Perspectives from a Physician**	**Quoc-Dien Trinh**	**15 min**
• Discussion/Debate	All & Audience	15 min

Can Distributional Cost Effectiveness Analysis (DCEA) Actually Inform and Improve Health Equity in Oncology?

Health Equity Perspectives from a Physician

Quoc-Dien Trinh, MD, MBA

ISPOR Atlanta, Tuesday May 7, 17:00 - 18:00

ACCESS TO CARE MATTERS

Marieke J Krimphove, MD

Marieke J. Krimphove | Alexander P. Cole | Sean A. Fletcher | Sabrina S. Harmouch | Sebastian Berg | Stuart R. Lipsitz | Maxine Sun | Junaid Nabi | Paul Nguyen | Jim C. Hu | Adam S. Kibel | Toni K. Choueiri | Luis A. Kluth | Quoc-Dien Trinh

Prostate Cancer Foundation
Curing Together.

When access to care, treatment, and cancer characteristics are accounted for, Black race was associated with better overall survival in men with advanced prostate cancer.

27%

Black men are 27% more likely to die when accounting for demographics

4%

Black men are 27% more likely to die when accounting for demographics and access to care

8%

Black men are 8% LESS likely to die when accounting for demo-graphics, access to care, treatment and cancer

Source: Krimphove et al, Prostate Cancer Prostatic Dis. 2019 Mar;22(1):125-136. doi: 10.1038/s41391-018-0083-4. Epub 2018 Aug 31.
Funded by the Prostate Cancer Foundation ($225,000)

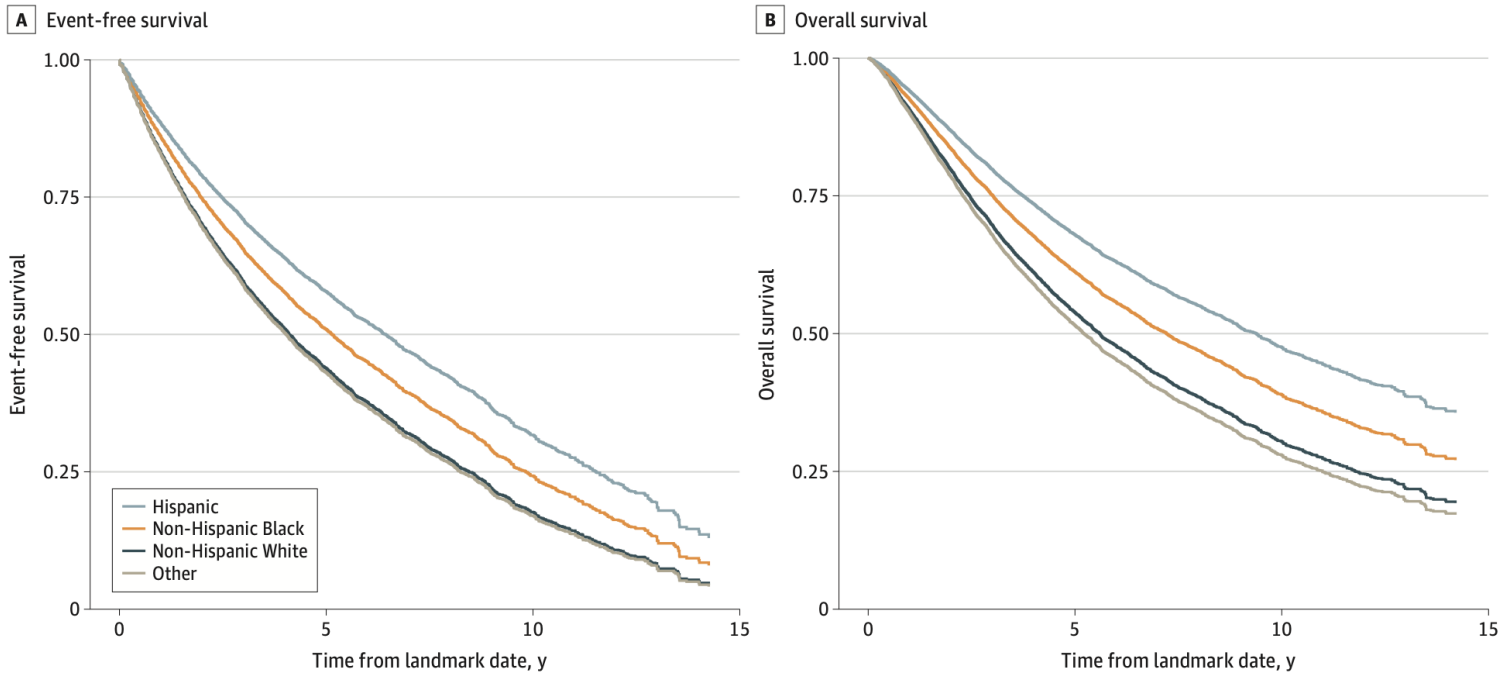
JAMA Network Open

Original Investigation | Oncology

Survival Outcomes by Race and Ethnicity in Veterans With Nonmetastatic Castration-Resistant Prostate Cancer

Kelli M. Rasmussen, MS; Vikas Patil, MS; Chunyang Li, PhD; Christina Yong, MA; Sreevalsa Appukkuttan, MBBS, MPH; Jamie Partridge Grossman, PhD, MBA; Jay Jhaveri, MD, MPH; Ahmad S. Halwani, MD

Figure 2. Adjusted Survival Curves for Survival by Race and Ethnicity



Metastasis-free (A) and overall (B) survival. The numbers at risk are not available for adjusted survival curves, because the survival curves are adjusted proportionally with the confounders. The original numbers at risk would not correctly reflect the curves. The same algorithm we used to create survival curves does not provide numbers at risk, because the scaling is working on survival probabilities. To our knowledge, there are no existing algorithms to scale the number of people in such cases. Other includes American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, unknown by patient, and patient declined to answer.

RACIAL DISPARITY IN DELIVERING DEFINITIVE THERAPY FOR INTERMEDIATE/HIGH-RISK LOCALIZED PROSTATE CANCER

David Friedlander,
MD

available at www.sciencedirect.com
journal homepage: www.europeanurology.com

European Association of Urology

Prostate Cancer

Racial Disparity in Delivering Definitive Therapy for Intermediate/High-risk Localized Prostate Cancer: The Impact of Facility Features and Socioeconomic Characteristics

David F. Friedlander [a,†], Quoc-Dien Trinh [a,b,†,], Anna Krasnova [b], Stuart R. Lipsitz [b], Maxine Sun [b], Paul L. Nguyen [c], Adam S. Kibel [a], Toni K. Choueiri [c], Joel S. Weissman [b], Mani Menon [d], Firas Abdollah [d]*

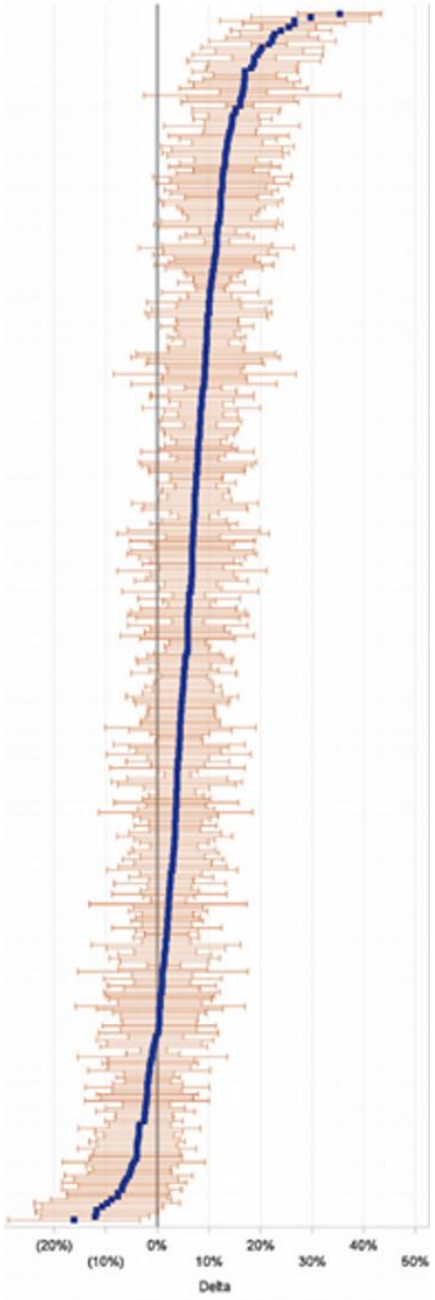
[a] Brigham and Women's Hospital, Division of Urological Surgery, Harvard Medical School, Boston, MA, USA; [b] Center for Surgery and Public Health, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA; [c] Department of Medical Oncology, Dana-Farber Cancer Institute and Brigham and Women's Hospital, Boston, MA, USA; [d] Vattikuti Urology Institute, Henry Ford Health System, Detroit, MI, USA

39%

of treating facilities demonstrated significantly higher rates of definitive therapy in White men

1%

of treating facilities demonstrated significantly higher rates of definitive therapy in Black men

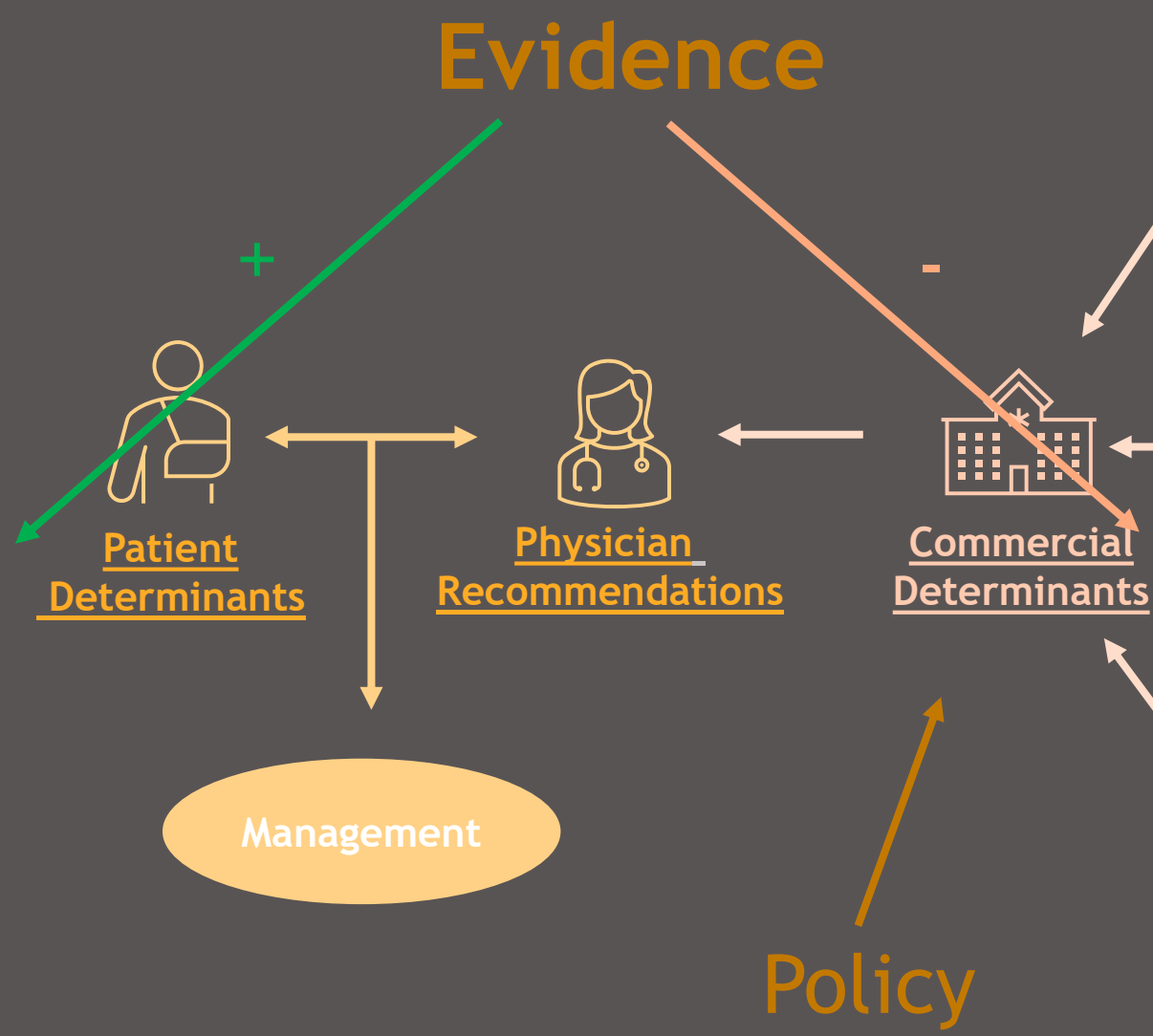


What MAY drive management decisions…

Social/Environmental
- *Economic stability*
- *Neighborhood/Built environment*
- *Education*
- *Food insecurity*
- *Community/Social support*

Biological
- *Age*
- *Underlying health*
- *Disease severity*

Patient Preferences
- *Perspectives*
- *Beliefs*
- *Expectations*
- *Goals for health and life*



Finance
- *Payment*
- *Ownership*
- *New technology*
- *Promotional payments*

Physician Organization
- *Single specialty vs. multispecialty group*
- *Hospital employment*
- *Private equity*

Market
- *Competition between physicians*
- *Competition between payors*
- *Prices for services*

In the clinical setting, DCEA can inform more equitable healthcare strategies by identifying interventions that not only are cost-effective but also reduce health disparities.

United against racism

THE MGB PROSTATE CANCER OUTREACH CLINIC

VISION

The MGB prostate cancer outreach clinic will serve as a catalyst to bring our communities together through compassionate prostate cancer care.

MISSION

MGB PCOC to offer high-quality, accessible, and affordable prostate cancer care to minority men.

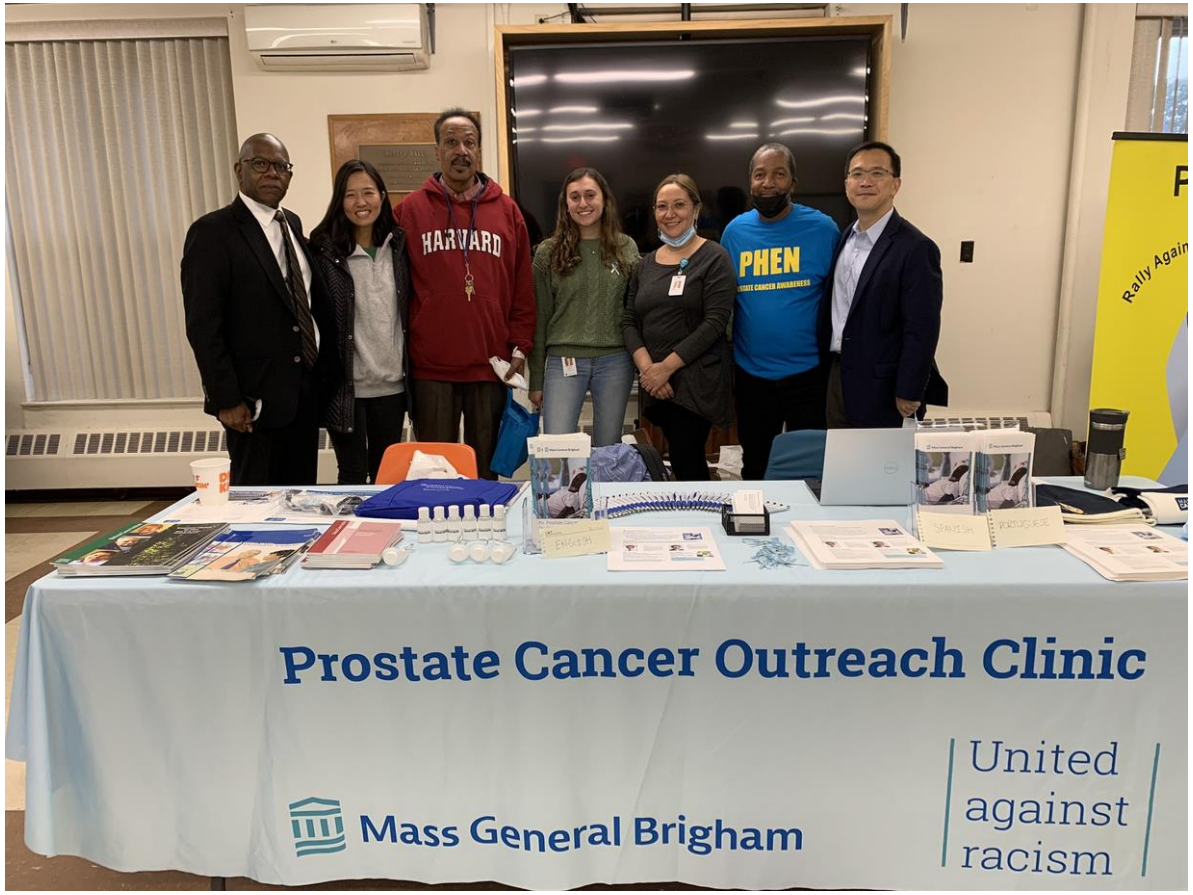
1. Description
   MGB Prostate Cancer Outreach Clinic
2. Customer
   Minoritized populations with insurance coverage
3. How
   Patient education and marketing, PCP outreach, safety net initiatives
4. Value
   Provide the best PCa care to minoritized populations through MGB or community partners
5. Investment
   Synergy with other research and operational opportunities, fundraising
6. KPI
   Inc minority PCa vol by 500 pts/yr
   dec minority PCa mortality in MA by 50% within 10 yrs

Quoc-Dien Trinh, MD, MBA

Adam Feldman, MD, MPH

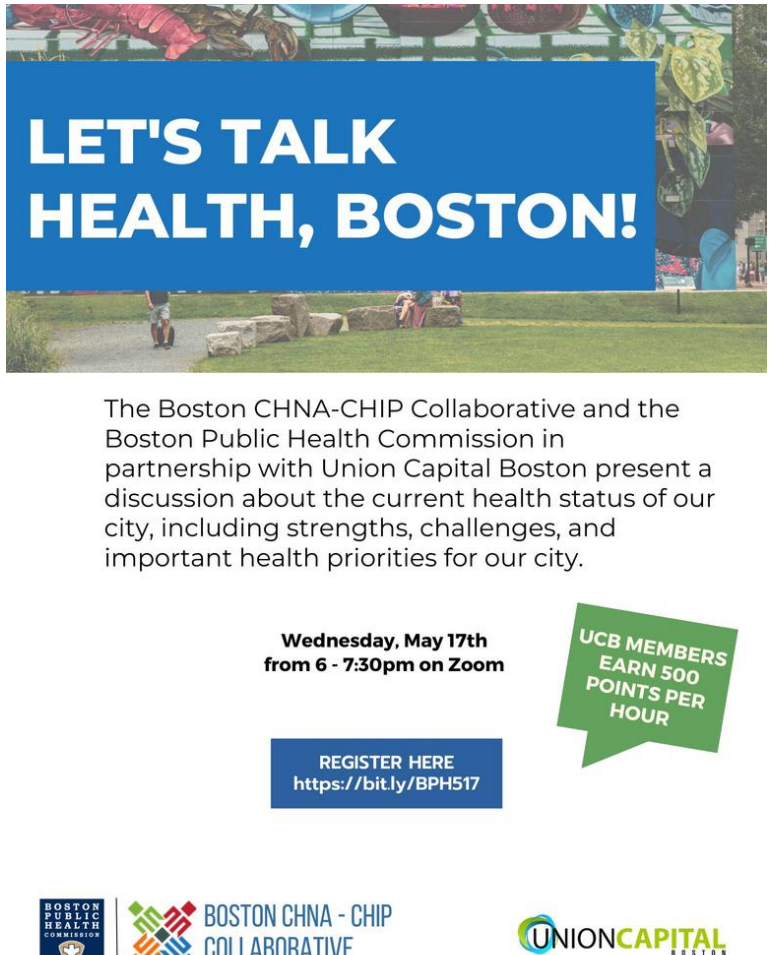
COMMUNITY ENGAGEMENT

Men's Health Fair organized in collaboration with BWH Community Health



MGB WIDE COLLABORATION

16 community events since inception, 5 upcoming events in the next month



‘So much more to do’

An inside view of Mass General Brigham’s sweeping campaign to confront institutional racism

By Usha Lee McFarling
STAT

When a routine cancer screening came back showing an elevated PSA reading, George Brickhouse knew he should take it seriously. His father had been treated for prostate cancer and his brother had dealt with a scare. But the urologist started ordering tests without fully explaining why. And when he couldn’t get through to a live person to schedule an MRI, Brickhouse gave up trying to find out whether he had cancer. “I wasn’t comfortable with being pushed through,” he said.

Then Brickhouse met Dr. Quoc-Dien Trinh. It was during a Zoom meeting for Black men, part of an outreach program run by Mass General Brigham where Trinh and other physicians walked through the process of screening and treating prostate cancer. Brickhouse said it made him feel open to coming in for an appointment.

When he did, Brickhouse was pleased to find his care would be overseen by Trinh, a urologic oncologist considered one of the nation’s best young urologists. Though Trinh’s schedule gets booked months in advance, he has blocked off time for patients like Brickhouse who come in through the outreach program.

It’s a sign of change at Mass General Brigham, which has faced criticism for not being welcoming to patients from the city’s disadvantaged neighborhoods. The state’s largest health care system is undertaking a sweeping campaign to confront and address the systemic racism that has led here, as it has across the nation, to poorer health outcomes and higher death rates for patients of color.

While many health systems and hospitals are just starting to address medical racism, the work at Mass General Brigham seems to be in overdrive. Called United Against Racism, the $40 million initiative has launched more than a dozen programs in clinics and hospitals to provide anti-racist care and has more programs in development.

Clinicians are looking hard at disparities among their patients — from why Black women are less likely to receive knee replacements to why Black men are more likely to be accosted by hospital security and why non-English speakers miss so many follow-up appointments — and testing sometimes surprisingly simple ways to end them.

Creating large-scale change hasn’t been easy. Institutional inertia and ranks of skeptical doctors have slowed the work.

“It was messy. It was sausage-making,” Karen Fiumara, a vice president for patient safety at Brigham and Women’s Hospital, said of its nascent efforts to understand and confront health disparities in 2017.

Fiumara is among hospital leaders who have embraced health equity work. “I am so proud of what we are doing,” she said, “And oh, my God, there is so much more to do.”

The work is being hailed as a national model by the American Medical Association, which has enlisted Fiumara and other leaders to share what they’ve learned with other institutions. The AMA has even hired one of the Brigham physicians who worked on health equity issues, Karthik Sivashanker, as a vice president in its Center for Health Equity.

PHOTOS BY VANESSA LEROY FOR STAT NEWS

George Brickhouse (top) said an outreach meeting for Black men to screen and treat for prostate cancer run by Dr. Quoc-Dien Trinh, a urologic surgeon, made him feel open about making an appointment.

Because many of the programs are still getting underway, numbers showing improved patient outcomes in many areas are probably a year or more away. But some progress is already apparent. A program aiming to reduce uncontrolled hypertension in Black and Hispanic patients, by boosting screening for social needs and offering support from community health workers, has narrowed a 6.7 percent gap between Black and white patients to 5.5 percent and a 3.3 percent gap between Hispanic and white patients to 2.4 percent in five months, said Dr. Allison Bryant, a maternal-fetal medicine specialist and senior medical director for health equity at Mass General Brigham.

The system has also cut to below 5 percent the number of patients who don’t have race and language data in their records and increased the enrollment of Black and Hispanic patients into the system’s health portal by more than 20 percent, she said.

MASS GENERAL BRIGHAM, Page D2

Interventions that reduce prostate cancer mortality: targeted screening?

The Impact of Intensifying Prostate Cancer Screening in Black Men: A Model-Based Analysis

Yaw A. Nyame, MD,[1,2] Roman Gulati, MS,[2,*] Eveline A. M. Heijnsdijk, PhD,[3] Alex Tsodikov, PhD,[4] Angela B. Mariotto, PhD,[5] John L. Gore, MD,[1,2] Ruth Etzioni, PhD[2]

[1]Department of Urology, University of Washington Medical Center, Seattle, WA, USA; [2]Division of Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, WA, USA; [3]Department of Public Health, Erasmus Medical Center, Rotterdam, The Netherlands; [4]Department of Biostatistics, School of Public Health, University of Michigan, Ann Arbor, MI, USA and [5]Division of Cancer Control and Population Sciences, National Cancer Institute, Bethesda, MD, USA

***Correspondence to:** Roman Gulati, MS, Division of Public Health Sciences, Fred Hutchinson Cancer Research Center, 1100 Fairview Ave N, M2-B230, Seattle, WA 98109-1024, USA (e-mail: rgulati@fredhutch.org).

NCCN Guidelines Version 2.2024
Prostate Cancer Early Detection

NCCN Guidelines Index
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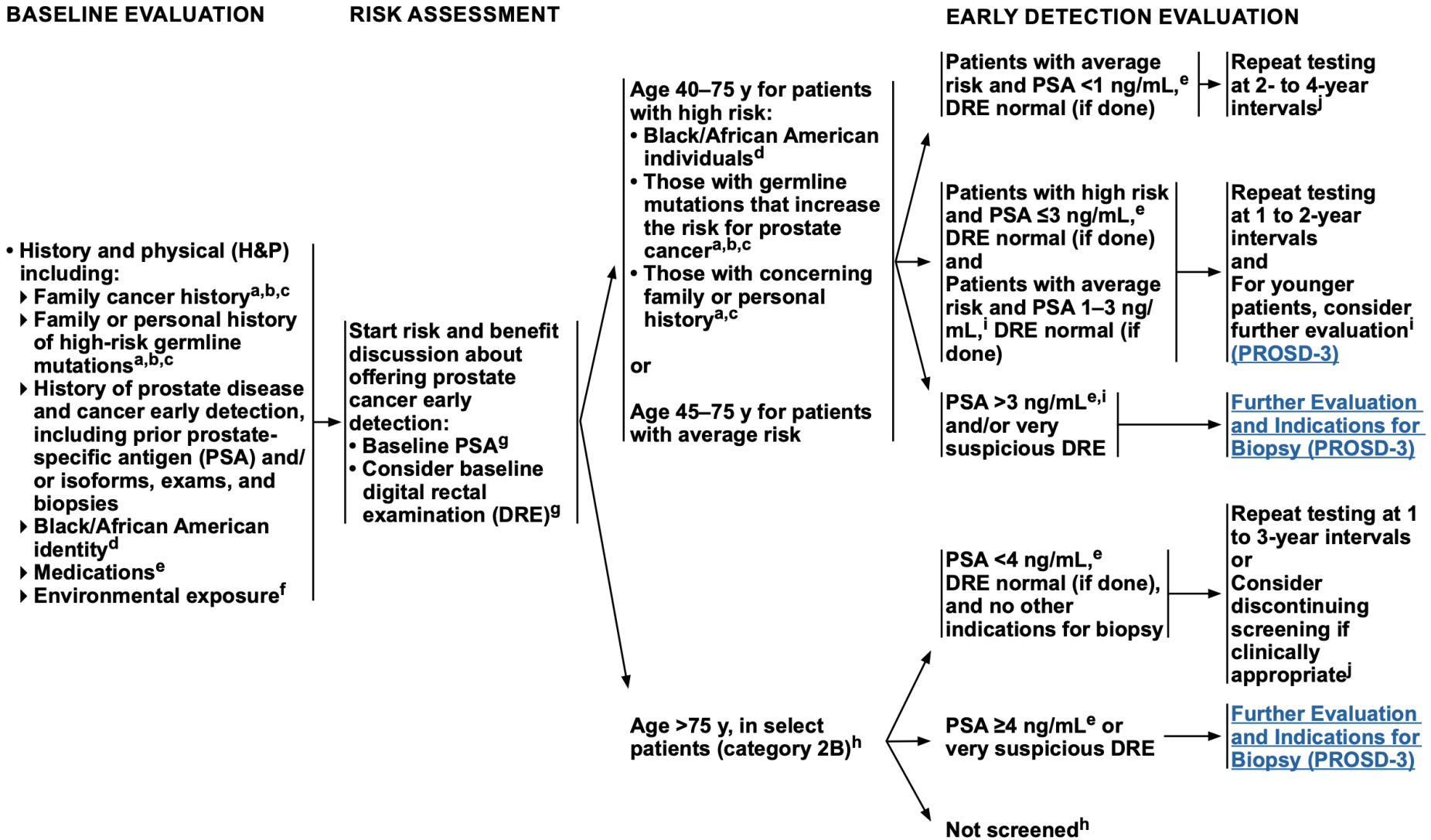
Discussion



See footnotes on PROSD-2A and PROSD-2B

The Health Inequality Impact of Darolutamide for Non-Metastatic Castration-Resistant Prostate Cancer - A Distributional Cost-Effectiveness Analysis

Jeroen P Jansen[1], Iris Brewer[1], Thomas Flottemesch[1], Patrick Sullivan[1], Jamie Partridge Grossman[2]

1. PRECISIONheor, Bethesda, MD, USA. 2. Bayer Pharmaceuticals, Inc., Whippany, New Jersey, USA

BACKGROUND

- The impact of a new intervention on inequality in health outcomes is increasingly viewed in health technology assessment as important.
- Non-Hispanic (NH) Black patients are disproportionally affected by non-metastatic castration-resistant prostate cancer (nmCRPC).[1-3]
- Darolutamide is an approved treatment for nmCRPC and was shown to be effective and safe among NH-Black patients in the ARAMIS Phase III trial.[4-6]
- Distributional cost-effectiveness analysis (DCEA) is an intuitively appealing extension of conventional cost-effectiveness analysis to quantify health inequality impact of a medical intervention.[7-9]

OBJECTIVE

To quantify the health inequality impact of darolutamide + androgen-deprivation therapy (ADT) relative to ADT for nmCRPC in the U.S. by means of a DCEA.

METHODS

- With a decision model (i.e., an individual continuous time state-transition model), the quality-adjusted life years (QALYs) and costs with darolutamide+ADT and ADT were estimated for NH-White, NH-Black, Asian, and Hispanic nmCRPC patients over a lifetime horizon.
- Given the lifetime risk of nmCRPC, and assuming health opportunity costs are equally divided within the general population, the incremental net health benefits (iNHB) of darolutamide+ADT relative to ADT at the general population level (expressed per 100,000 individuals) were calculated by race and ethnicity based on expected QALYs by subgroup and average costs across subgroups by treatment.
- Adding the iNHB to reference quality adjusted life expectancy at birth (QALE) values by race and ethnicity for the US general population, we got QALE estimates when ADT is replaced by darolutamide+ADT.
- The degree of differences in expected QALYs in the target patient population and QALEs in the US general population according to race and ethnicity was expressed with Atkinson relative inequality indices (0 = equal outcomes and 1 = maximum inequality between subgroups) for both strategies.[10] Their difference was defined as the health inequality impact of darolutamide in the target patient population and US general population.

METHODS (continued)

- The core elements of the decision model to estimate distributional effects with darolutamide were:
  - Distribution of NH-White, NH-Black, Asian, and Hispanic individuals in the general population, their QALEs, and their lifetime risk of nmCRPC.[11-14]
  - Transition rates between non-metastatic disease, metastatic disease, and death as a function of time, treatment, and race and ethnicity as estimated from the progression-free survival (PFS) and overall survival (OS) data from the ARAMIS trial. To capture differences in US nmCRPC survival across race and ethnicity, disease progression rates were adjusted according to the prognostic effect of race and ethnicity in the US.[4-5]
  - Utility (quality of life multiplier) for non-metastatic and metastatic disease.[15]
  - Drug acquisition costs, adverse event costs, and general disease management costs from a US healthcare perspective.[15,16]

RESULTS

- Darolutamide+ADT resulted in an additional 1.04 QALYs per treated patient relative to ADT, with the greatest gain observed among NH-Black patients (**Table 1**).
- As a result, the inequality in expected QALYs among nmCRPC patients treated with ADT disappears with darolutamide+ADT (**Figure 1**).
- Specifically, the relative inequality in QALYs among nmCRPC reduced by 66%, from an inequality score of 0.032 (0.004; 0.080) with ADT to 0.011 (0.000; 0.049) with darolutamide+ADT (**Figure 3**).
- Given the uncertainty in the health inequality impact estimates, there is ~86% probability that darolutamide results in smaller dissimilarities in health outcomes among treated patients.
- Given the iNHB per 100,000 general population (**Figure 2**), the reference QALEs for the US general population were translated into QALEs when ADT is replaced with darolutamide+ADT (**Table 2**).
- The relative inequality in US general population health distributions (expressed in QALE) reduced with darolutamide as well (**Figure 4**).

RESULTS (continued)

Figure 1: Expected QALYs with darolutamide + ADT and ADT for a representative target patient by race and ethnicity

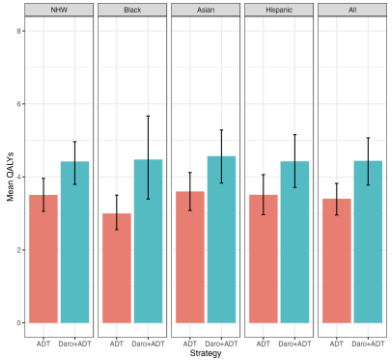


Table 1: Incremental QALYs and costs with darolutamide + ADT relative to ADT

	Subgroup	Estimate	95% confidence interval	
Incremental QALYs per patient	NHW	0.92	0.56	1.28
	NH-Black	1.48	0.49	2.72
	Asian	0.97	0.48	1.53
	Hispanic	0.92	0.50	1.35
	All	1.04	0.57	1.49
Incremental costs per patient (US$)	All	$152,378	$114,404	$191,693

Figure 2: Incremental net health benefit (iNHB) per 100,000 individuals of the general population factoring in equally distributed opportunity costs at a threshold of $150k per QALY

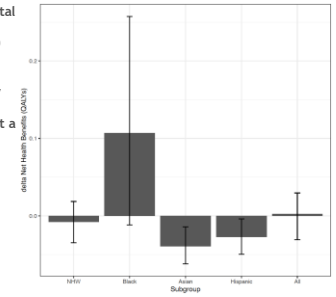


Table 2: Quality adjusted life expectancy (QALE) per member of the general population by race and ethnicity without and with darolutamide

Subgroup	QALE without darolutamide	95% confidence interval		QALE with darolutamide	95% confidence interval	
NHW	68.798	68.798	68.798	68.790	68.763	68.816
NH-Black	65.446	65.446	65.446	65.553	65.435	65.704
Asian	74.878	74.878	74.878	74.839	74.816	74.864
Hispanic	71.762	71.762	71.762	71.735	71.712	71.758
All	69.283	69.283	69.283	69.286	69.252	69.313

Figure 3: The joint uncertainty distribution of the reduction in the relative inequality in QALYs and average gain in QALYs per target patient with darolutamide +ADT relative to ADT

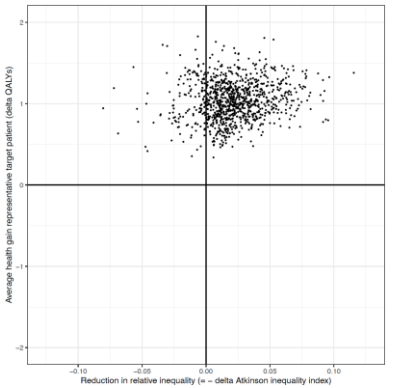
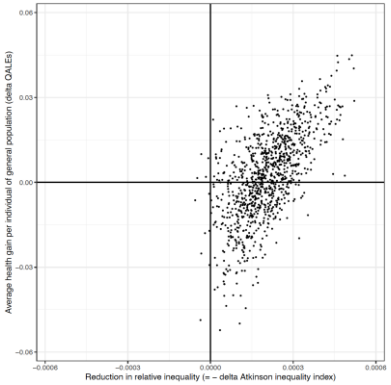


Figure 4: The joint uncertainty distribution of the reduction in the relative inequality in QALE and average gain in QALE per 100,000 individuals of the general population with darolutamide relative to no darolutamide assuming an opportunity cost threshold of $150k



LIMITATIONS

- We defined subgroups solely based on race and ethnicity.
- The assumption of equally-distributed opportunity costs in this study is convenient and arguably conservative but may not be realistic.
- The current analysis shows how the inequality in outcomes can change with darolutamide under the assumption there is no inequality in terms of access. If there is, the extent of the reduction in inequality will be less.

CONCLUSION

Darolutamide+ADT for the treatment of nmCRPC results in greater health outcomes than ADT across all subgroups according to race and ethnicity. With disproportionate benefits in NH-Blacks, darolutamide may reduce inequality in health outcomes in the U.S.

REFERENCES

1. Rawla P. Epidemiology of prostate cancer. *World journal of oncology.* 2019;10(2):63.
2. Smith ZL, Eggener SE, Murphy AB. African-American prostate cancer disparities. *Current urology reports.* 2017;18(10):1-10.
3. Panigrahi GK, Praharaj PP, Kittaka H, et al. Exosome proteomic analyses identify inflammatory phenotype and novel biomarkers in African American prostate cancer patients. *Cancer medicine.* 2019;8(3):1110-1123.
4. Fizazi K, Shore N, Tammela TL, et al. Nonmetastatic, castration-resistant prostate cancer and survival with darolutamide. *N Engl J Med.* 2020;383(11):1040-1049.
5. Shore ND, Cruz F, Nordquist L, Belkoff L, Aronson WJ, Tolia B, Cinman A, Sharifi R, Ortiz J, Parkin J, Srinivasan S, Sarapohja T, Smith MR. Efficacy and safety of darolutamide in Black/African-American patients from the phase III ARAMIS study. *Future Oncol.* 2022;18(40):4473-4482.
6. Shore ND, Cruz F, Nordquist L, Belkoff L, Aronson WJ, Tolia B, Cinman A, Sharifi R, Ortiz J, Parkin J, Srinivasan S, Sarapohja T, Smith MR; ARAMIS Investigators. Darolutamide in nonmetastatic, castration-resistant prostate cancer. *N Engl J Med.* 2019;380(13):1235-1246
7. Asaria M, Griffin S, Cookson R. Distributional cost-effectiveness analysis: A tutorial. *Med Decis Making.* Jan 2016;36(1):8-19.
8. Cookson R, Griffin S, Norheim OF, Culyer AJ. *Distributional Cost-Effectiveness Analysis Quantifying Health Equity Impacts and Trade-Offs: Quantifying Health Equity Impacts and Trade-Offs.* Oxford University Press; 2020.
9. Cookson R, Mirelman AJ, Griffin S, et al. Using cost-effectiveness analysis to address health equity concerns. *Value Health.* 2017;20(2):206-212.
10. Atkinson A. On the measurement of inequality. *Journal of Economic Theory.* 1970;2(3):244-63.
11. United States Census Bureau. QuickFacts United States. United States Census Bureau; 2022. https://www.census.gov/quickfacts/fact/table/US/PST045221;
12. SEER*Explorer: An interactive website for SEER cancer statistics [Internet]. Surveillance Research Program, National Cancer Institute; 2023 Apr 19. [updated: 2023 Jun 8; cited 2023 Sep 7]. Available from: https://seer.cancer.gov/statistics-network/explorer/. Data source(s): SEER Incidence Data, November 2022 Submission (1975-2020), SEER 22 registries.
13. Hill L, Artiga S, Haldar S. Key facts on health and health care by race and ethnicity. Kaiser Family Foundation. 2022;26
14. Kowal S, Ng CD, Schuldt R, Sheinson D, Cookson R. The impact of funding inpatient treatments for COVID-19 on health equity in the united states: A distributional cost-effectiveness analysis. *Value Health.* 2023;26(2):216-225
15. Rind et al. Antiandrogen Therapies for Nonmetastatic Castration-Resistant Prostate Cancer: Effectiveness and Value. Institute for Clinical and Economic Review (ICER), 2018.
16. Appukkuttan S, Farej R, Miles L, Purser M, Wen L. Budget impact analysis of darolutamide for treatment of nonmetastatic castration-resistant prostate cancer. *J Manag Care Spec Pharm.* 2021;27(2):166-174.

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CONCLUSION

Darolutamide+ADT for the treatment of nmCRPC results in greater health outcomes than ADT across all subgroups according to race and ethnicity. With disproportionate benefits in NH-Blacks, darolutamide may reduce inequality in health outcomes in the U.S.

ACKNOWLEDGEMENTS

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a precision value & health team

Improved access to drugs to mitigate racial disparities?

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Synthesizing diverse strategies into a cohesive approach

- **Access to Care:** Studies indicate that improved access to care in advanced disease stages can mitigate, *or even reverse*, racial disparities
- **Policy & Outreach:** Dual approach to reducing care variation:
  - Implement policy changes for broader healthcare access
  - Invest in targeted outreach to marginalized communities for early prostate cancer diagnosis and improved treatment of advanced disease
- **DCEA Utilization:** Guides clinicians in:
  - Prioritizing outreach efforts to the populations most in need
  - Developing clinical guidelines that incorporate equity-focused strategies

Limitations of DCEA

- **Data requirements:** Implementing DCEA requires detailed unbiased data on health outcomes by demographic and socioeconomic status. Collecting and analyzing this data can be challenging.
- **Complex decision-making:** Interventions that are most cost-effective on average may not be the most equitable.
- **Ethical considerations:** Prioritizing interventions based on their equity impact can raise ethical questions.
- **Integration into clinical practice:** Clinicians need guidance on how to apply these insights in a way that respects patient autonomy and addresses the complexities of individual patient care.

Session Outline

Key Question:	Can distributional cost-effectiveness analysis (DCEA) **actually inform and improve health equity** in oncology?

Session:	Speaker	Timing
• Introduction: Health Equity in Oncology	Jamie Grossman	5 min
• Quantify Health Equity Impact with DCEA	Jeroen Jansen	15 min
• Health Equity Perspectives from a Payer	Maria Lopes	10 min
• Health Equity Perspectives from a Physician	Quoc-Dien Trinh	15 min
• **Discussion/Debate**	**All & Audience**	**15 min**

Why should health system stakeholders believe in DCEA?

How can DCEA actually be implemented within a health system?

What can DCEA ultimately do for a patient and their care?