Evaluation of Ancestry Information Markers (AIMs) from Previous ACOSOG/CALGB/NCCTG Trials

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Racial and Ethnic Disparities in Cancer Outcomes

Compare racial/ethnic disparities in relative cancer survival for more amenable cancers (e.g., breast, prostate) to less amenable cancers (e.g., pancreatic)

Examine the following groups:

1) AIMs and race/ethnic concordance

2) AIMs and race/ethnic discordance

Genetic ancestry proportions

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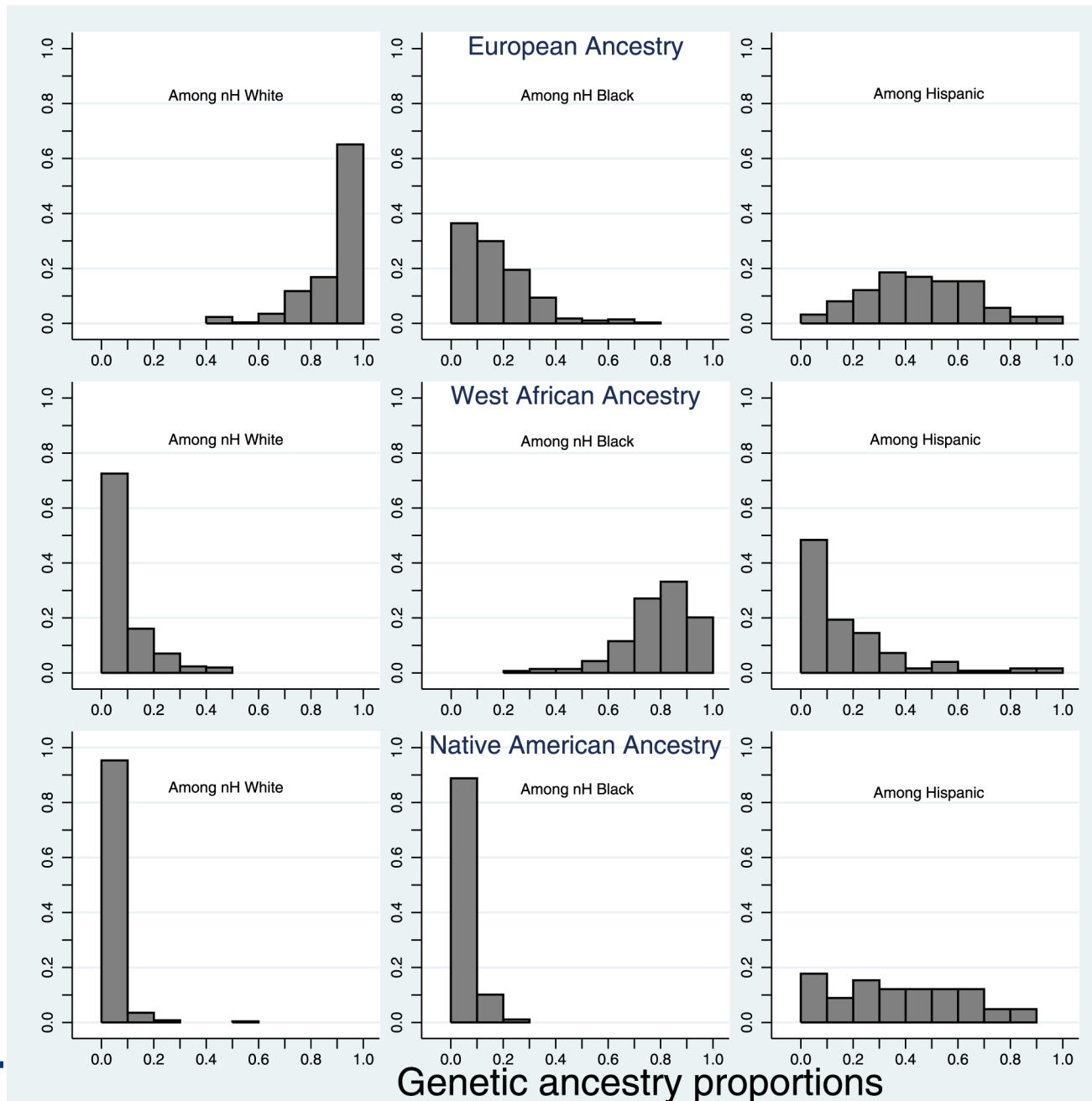
Fundamental Cause Hypothesis

Disparities emerge in situations where the knowledge, technology and effective medical interventions for controlling a disease exist, allowing individuals with greater access to important social and economic resources (e.g., knowledge, income, beneficial social relations) to delay and avoid death from that disease.

In contrast, in situations where effective medical interventions are absent or negligible, social resources are of limited utility, and survival differences between the most and least socially advantaged persons are minimal.

Thus, the greater importance of resources for cancers that are amenable to medical interventions would lead to significantly larger survival disparities than what would be observed for cancers with more limited early detection and treatment capacities

Amenability index

Based on SEER statistics for 5-year (5Y) RSRs for 53 cancer sites

Ranges from low (e.g., 5% for pancreatic)

To very high (e.g., 99% for prostate cancer)

Index can be used as continuous or categorized into

Mostly non-amenable - < 40%

Partly amenable and 40-69%

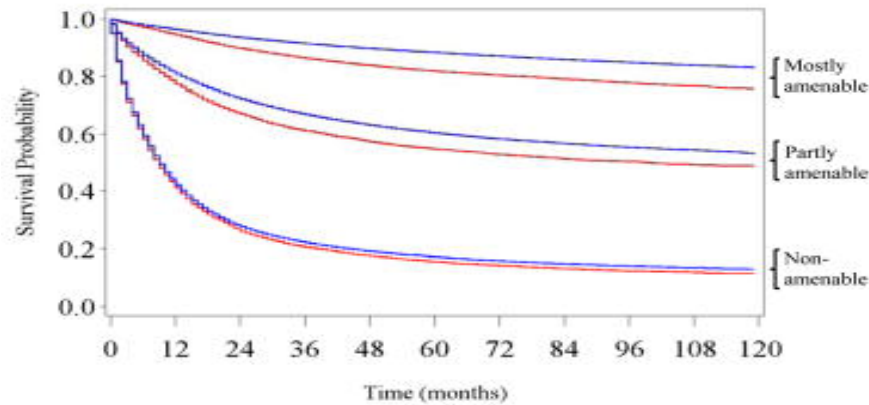Mostly amenable cancers $\geq$ 70%
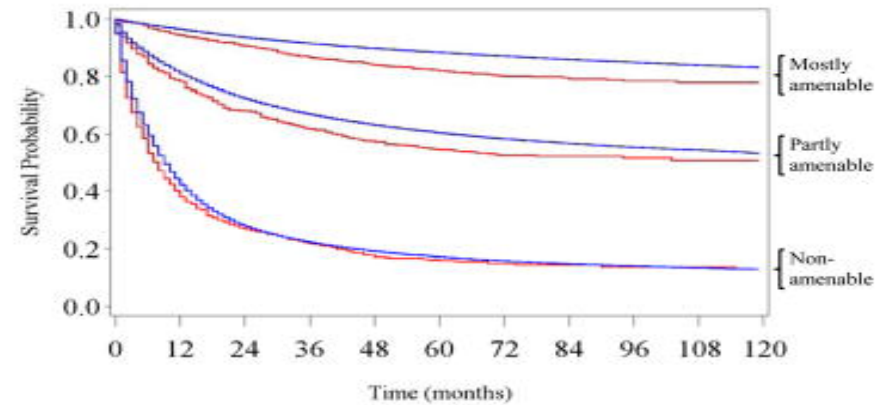
with <40%, 40–69% and ≥70%

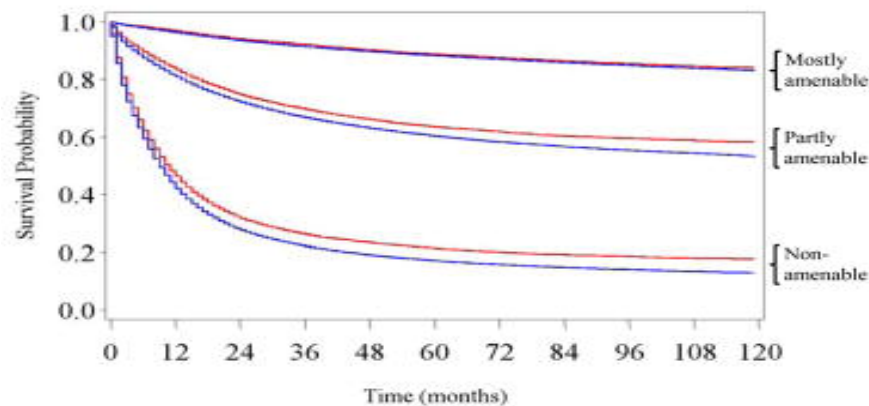# Relative Survival Differences by Amenability

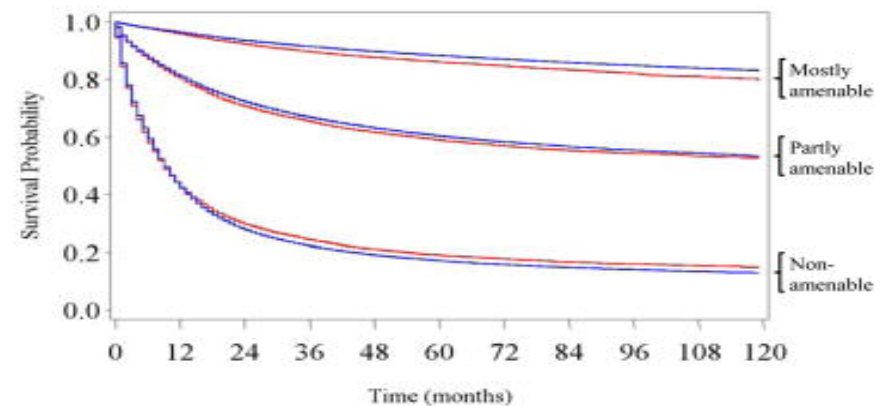African Americans (red line) and Whites (blue line)

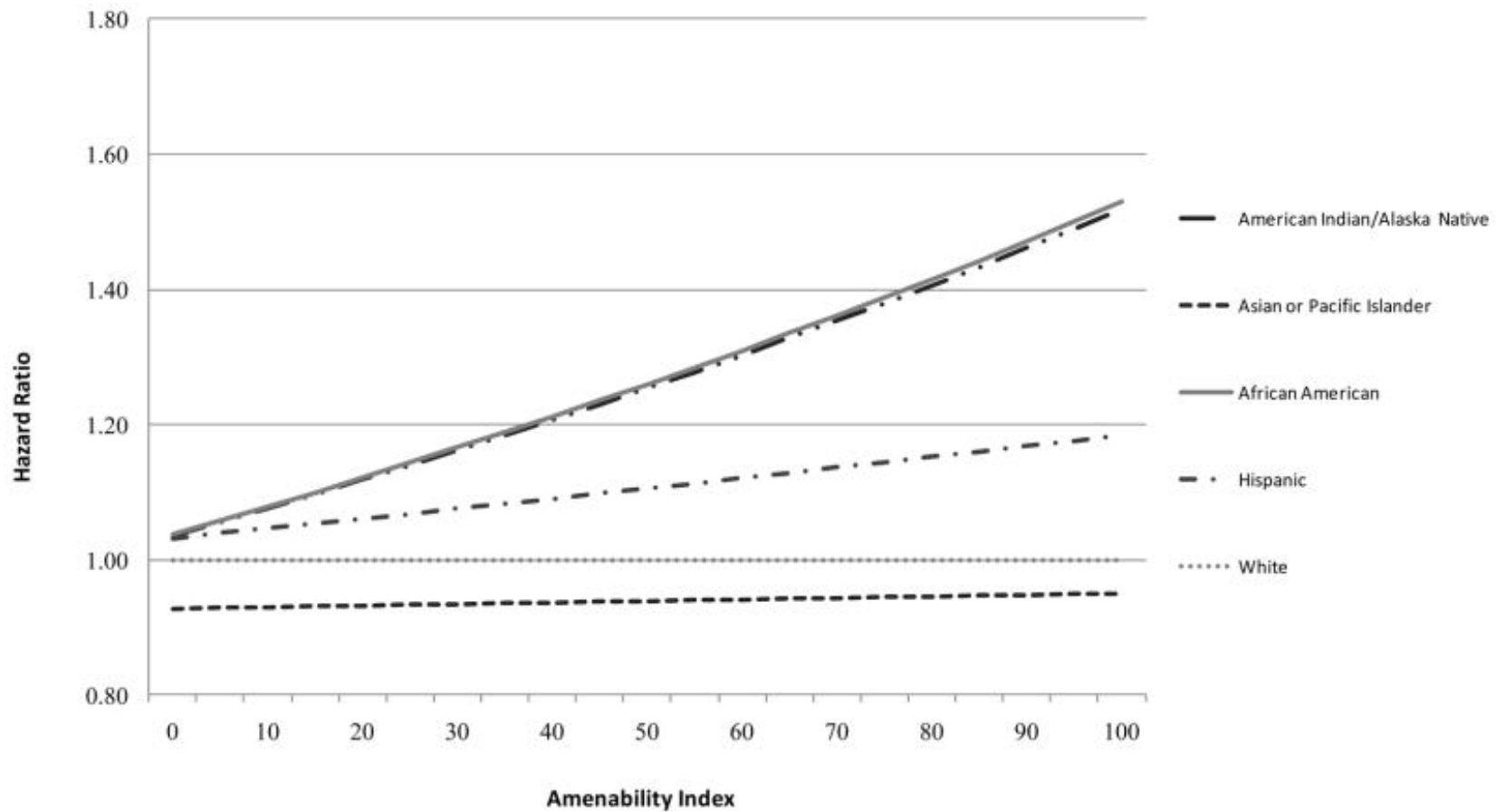American Indians/Alaska Natives (red line) and Whites (blue line)

Asians/Pacific Islanders (red line) and Whites (blue line)

Hispanics (red line) and Whites (blue line)

Relative differences across the continuum

Draft hypotheses to be Tested	More amenable cancers (breast and prostate trials)	Less amenable cancers (pancreatic trials)
Self-reported Race/ ethnicity	Greater relative differences	Smaller relative differences
AIMs and Self-reported race/ethnicity concordances (MR- not confounding)	Greater relative differences	Smaller relative differences
AIMs and Self-reported race/ethnicity discordancies (+/-) Suggest do not identify with social grouping	Smaller relative differences than the concordant group, differences may argue against fundamental causes	Do not expect differences, any differences may be from differences in underlying pathways correlated with AIMS
AIMs and Self-reported race/ethnicity discordancies (-/+)	Greater relative differences – driven by fundamental causes	Smaller relative differences

Approach

Use group (e.g., race) as a surrogate to identify causes of cancer

Identify etiologic and prognostic variables:

- Health care
- Behavior
- Residential/demographic
- Epidemiological
- Biological

Cancer Mortality Disparity Priorities

Priority	Group	Men	Women
1	Greatest disparity in rates (>2x) with unfavorable trends	Stomach	Myeloma, Stomach
2	Greatest disparity in rates (>2x) with favorable trends	Larynx, Prostate	Uterine Cervix
3	Large disparity (1-2x) with unfavorable trends	Colon and Rectum	Breast, Corpus Uteri, Esophagus, Thyroid
4	Large disparity (1-2x) with favorable trends	Liver/Hepatic Bile Duct, Lung and Bronchus, Myeloma, Oral Cavity and Pharynx, Pancreas	Colon and Rectum, Larynx, Liver/Hepatic Bile Duct, Pancreas, Urinary Bladder
5	Favorable rates in Blacks with unfavorable trends	Non-Hodgkin Lymphoma, Testis	Hodgkin Lymphoma, Kidney and Renal Pelvis, Lung and Bronchus, Non-Hodgkin Lymphoma, Ovary
6	Favorable rates in Blacks with favorable trends	Brain/CNS, Esophagus, Hodgkin Lymphoma, Kidney and Renal Pelvis, Leukemia, Melanoma, Thyroid, Urinary Bladder	Brian/CNS, Leukemia, Melanoma, Oral Cavity and Pharynx

Potential Research Directions Using Alliance Data and Resources

Topic	Predictors	Outcome
Genomic Ancestry	Ancestry/AIMs	(Biological) Disease Aggressiveness
Biological-Social Interactions	Ancestry/AIMs, Neighborhood	Race-ancestry-social environment correlation
Biological-Social Interactions	Ancestry/AIMs, Neighborhood	(Biological) Disease Aggressiveness
Amenability	Ancestry/AIMs, Self-Reported Race	Amenability Index

Alliance Studies with DNA and/or Genetic Data

Clinical Trial (DISEASE)	40101* Breast Cancer	50303 Non-Hodgkins Lymphoma	80101 Stomach Cancer	80203 Colo-rectal Cancer	80303 Pancreatic Cancer	80405 Metastatic Colon Cancer	90401 Prostate Cancer	Total
Sample Size	3314 (39%)	423 (5%)	546 (6.5%)	238 (3%)	602 (7%)	2283 (27%)	1050 (12.5%)	8456
Caucasian	2759 (83%)	339 (80%)	403 (74%)	207 (87%)	529 (88%)	1859 (81.5%)	923 (88%)	7019 (83%)
African American	362 (11%)	47 (11%)	71 (13%)	27 (11%)	49 (8%)	273 (12%)	110 (10.5%)	939 (11%)
Asian	62 (2%)	14 (3%)	45 (8%)	1 (0.5%)	10 (1.5%)	72 (3%)	7 (0.5%)	211 (2.5%)
Other	36 (1%)	7 (2%)	4 (1%)	1 (0.5%)	5 (1%)	25 (1%)	5 (0.5%)	83 (1%)
Unknown	95 (3%)	16 (4%)	23 (4%)	2 (1%)	9 (1.5%)	54 (2.5%)	5 (0.5%)	204 (2.5%)
Genomics Consent	2768 (84%)	384 (91%)	416 (76%)	219 (92%)	475 (79%)	1756 (77%)	864 (82%)	6882 (81%)

Framework

Identify leading disparities problems

Identify potential studies with relevant data

Assess availability of genotypes and DNA

Geocode data

Link to census and other data

Analyze biological, individual, and neighborhood level data

Participants Thus Far

Electra Paskett (Ohio State)

Cheryl Thompson (Case)

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Marvella Ford (MUSC)

Mary Beth Terry (Columbia)

Tim Rebbeck (DFCI)