BIOGRAPHICAL SKETCH

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NAME: Iyer, Hari S.

eRA COMMONS USER NAME (credential, e.g., agency login): HIYER09

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Dartmouth College	AB	06/2009	Biology
Boston University School of Public Health	MPH	01/2012	Epidemiology
Harvard T. H. Chan School of Public Health	ScD	03/2020	Cancer Epidemiology
Dana-Farber Cancer Institute	Postdoctoral Fellowship	06/2022	Cancer Prevention and Early Detection

A. Personal Statement

I am an Assistant Professor in the Section of Cancer Epidemiology and Health Outcomes at Rutgers Cancer Institute of New Jersey. I launched the Precision Prevention of Prostate Cancer (PRE^2 CAP) laboratory to develop population-based prevention and early detection interventions for men at high risk of fatal prostate cancer. The PRE^2 CAP laboratory develops multilevel risk stratification models, incorporating environmental, healthcare access, and biological factors. My research seeks to improve understanding of environmental influences on tumor progression and severity. In addition, my lab applies geospatial analytic approaches to identify barriers to access in socioeconomically vulnerable populations. Evidence from this research will inform development of equity-oriented interventions to reduce the burden of prostate cancer, particularly in historically underrepresented groups. I bring technical expertise from the fields of environmental health and global health equity to my work as a cancer epidemiologist. I have co-authored forty-eight publications in leading cancer, environmental health and global health journals, and I have successfully competed for peer-reviewed funding from federal sources and non-governmental foundations.

Citations:

a. **Iyer HS**, Vaselkiv JB, Stopsack KH, Roscoe CJ, Zhang Y, Penney KL, Balk SP, Fiorentino M, Hart JE, James P, De Vivo I, Mucci LA, Laden F, Rebbeck TR. Influence of neighborhood social and natural environment on prostate tumor histology in a cohort of male health professionals. *American Journal of Epidemiology*. 2023. (Accepted).
b. **Iyer HS**, Hart JE, James P, Elliott EG, DeVille NV, Holmes MD, De Vivo I, Mucci LA, Laden F, Rebbeck TR. Impact of neighborhood socioeconomic status, income segregation, and greenness on blood biomarkers of inflammation. *Environment International*. 2022 Apr 1;162:107164. PMCID: PMC8985077.
c. **Iyer HS**, Valeri L, James P, Chen JT, Hart JE, Laden F, Holmes MD, Rebbeck TR. The contribution of residential greenness to mortality among men with prostate cancer: a registry-based cohort study of Black and White men. *Environ Epidemiol*. 2020 Apr 9;4(2):e087. doi: 10.1097/EE9.0000000000000087. PMID: 32337472; PMCID: PMC7147390.
d. **Iyer HS**, Gomez SL, Chen JT, Trinh QD, Rebbeck TR. Trends in mortality among Black and White men with prostate cancer in Massachusetts and Pennsylvania: Race and neighborhood socioeconomic position. *Cancer*. 2021 Jul 15;127(14):2525-2534. doi: 10.1002/cncr.33506. Epub 2021 Apr 2. PMID: 33798264; PMCID: PMC8249310.

B. Positions, Scientific Appointments and Honors

Positions and Employment

2022-	Assistant Professor, Section of Cancer Epidemiology and Health Outcomes, Rutgers Cancer Institute of New Jersey, New Brunswick
2022-	Adjunct Assistant Professor, Department of Epidemiology, Harvard T. H. Chan School of Public Health
2020-2022	Postdoctoral Fellow, Division of Population Sciences, Dana-Farber Cancer Institute, Boston

Other Experiences and Professional Memberships

2020-2021	Member, Patient Experience and Implementation Working Group, Lancet Commission on Diagnostics
2020-	Early Career Member, American Association For Cancer Research
2019-2020	Participant in Google Geo For Good Summit
2017-2018	Teaching Assistant, Department of Epidemiology & Department of Global Health & Population

Academic and Professional Honors

2020-2022	T32 National Research Service Award Institutional Training Grant Postdoctoral Trainee (NCI)
2019	Lancet Global Health Poster Award, Consortium of Universities for Global Health
2019	Harvey V. Fineberg Fellowship in Cancer Prevention, Harvard T. H. Chan School of Public Health
2018	Rose Service Learning Fellowship (co-recipient), Harvard T. H. Chan School of Public Health
2017	Rose Travel Award Fellow, Harvard T. H. Chan School of Public Health
2015-2019	T32 National Research Service Award Institutional Training Grant Predoctoral Trainee (NCI)

C. Contributions to Science

1. Associations between neighborhood environments and prostate cancer incidence and mortality
   I led studies to examine associations between neighborhood greenness (measured via NDVI through Google Earth Engine) and lethal prostate cancer incidence and mortality among men with prostate cancer using two large cohort databases. We found that neighborhood greenness was associated with lower risk of lethal prostate cancer in urban but not rural areas. Using registry data from Pennsylvania, neighborhood greenness was associated with lower mortality among Black and White men with prostate cancer, but while this relationship was strongest for cardiovascular mortality among White men, this association was not observed in Black men. Studying trends in disparities by race and neighborhood socioeconomic status using registry data from Pennsylvania and Massachusetts, we found evidence for narrowing of Black-White disparities, but stagnant or widening disparities by neighborhood socioeconomic status. In the state of Massachusetts, there was evidence of disparities in access to definitive treatment but not mortality by race, suggesting that more affordable insurance in Massachusetts may have yielded reductions in racial disparities in mortality.
   a. Cole AP, Herzog P, **Iyer HS**, Marchese M, Mahal BA, Lipsitz SR, Nyambose J, Gershman ST, Kennedy M, Merriam G, Rebbeck TR, Trinh QD. Racial differences in the treatment and outcomes for prostate cancer in Massachusetts. *Cancer*. 2021 Aug 1;127(15):2714-2723. doi: 10.1002/cncr.33564. Epub 2021 May 17. PMCID: PMC9107927.
   b. **Iyer HS**, Gomez SL, Chen JT, Trinh QD, Rebbeck TR. Trends in mortality among Black and White men with prostate cancer in Massachusetts and Pennsylvania: Race and neighborhood socioeconomic position. *Cancer*. 2021 Jul 15;127(14):2525-2534. doi: 10.1002/cncr.33506. Epub 2021 Apr 2. PMID: 33798264; PMCID: PMC8249310.
   c. **Iyer HS**, James P, Valeri L, Hart JE, Pernar CH, Mucci LA, Holmes MD, Laden F, Rebbeck TR. The association between neighborhood greenness and incidence of lethal prostate cancer: A prospective cohort study. *Environ Epidemiol*. 2020 Apr 9;4(2):e091. doi: 10.1097/EE9.0000000000000091. PMID: 32656487; PMCID: PMC7319229.

2. Applying causal inference modeling approaches to estimate impacts of health disparities
   Health disparities are defined as observed differences in health between population subgroups that are unjust and preventable. Health disparities research occurs in two phases: first generation research which describes disparities, and second generation research which proposes and models impacts of policies to reduce them. I have led investigations to advance second generation health disparities research through use of causal inference modeling approaches; for example I utilized causal mediation analysis to assess

the role of neighborhood greenness as a possible mediator of racial disparities in prostate cancer mortality. These approaches provide estimates of the impact of environmental and health care policies that, if changed, could narrow disparities arising from historical and ongoing discrimination against marginalized populations. In addition, I have led work comparing analyses driven by competing theories of causation with respect to biological vs social causes of health disparities.

a. **Iyer HS**, Gomez SL, Cheng I, Rebbeck TR. Relative impact of genetic ancestry and neighborhood socioeconomic status on all-cause mortality in self-identified African Americans. PLoS One. 2022 Aug 29; 17(8):e0273735. Doi: 10.1371/journal.pone.0273735. PMID: 36037186; PMCID: PMC9423617.
b. **Iyer HS,** Gomez SL, Fabian MP, Valeri L, Chen JT, James P, Hart JE, Laden F, Rebbeck T. Could equalizing neighborhood socioeconomic status and greenness reduce racial disparities in all-cause mortality among men with prostate cancer? *Presented as Oral Presentation at the 32nd Annual Conference of the International Society for Environmental Epidemiology (ISEE) to be held fully virtually from August 24-27, 2020*.
c. **Iyer HS**, Valeri L, James P, Chen JT, Hart JE, Laden F, Holmes MD, Rebbeck TR. The contribution of residential greenness to mortality among men with prostate cancer: a registry-based cohort study of Black and White men. *Environ Epidemiol*. 2020 Apr 9;4(2):e087. doi: 10.1097/EE9.0000000000000087. PMID: 32337472; PMCID: PMC7147390.
d. **Iyer HS**, Kohler RK, Masire D, Brown C, Molebatsi K, Grover S, Kablay I, Bvochora-Nsigno M, Efstathiou J, Lockman S, Tapela N, Dryden-Peterson SL. Explaining disparities in oncology health systems delays and stage at diagnosis between men and women in Botswana: A cohort study. *PLoS One* 2019 Jun 6;14(6):e0218094. PMCID: PMC6553768.

3. Multilevel studies of neighborhood environments, inflammation, and allostatic load

My work involves use of data that are often collected at varying spatiotemporal scales. I studied the association between neighborhood greenness and allostatic load, an index of physiologic stress response in a multi-country study of African men and women. We found that participants living in areas of higher greenness exposure had lower allostatic load measures. This work informed subsequent studies in two large prospective cohorts of male and female health professionals, examining associations between green spaces, neighborhood socioeconomic status, and air pollution in relation with inflammatory biomarkers. These studies demonstrate my ability to propose multilevel conceptual models involving neighborhood, lifestyle, and biomarker data that can be empirically tested, and expertise in geospatial analysis.

a. **Iyer HS**, Vaselkiv JB, Stopsack KH, Roscoe CJ, Zhang Y, Penney KL, Balk SP, Fiorentino M, Hart JE, James P, De Vivo I, Mucci LA, Laden F, Rebbeck TR. Influence of neighborhood social and natural environment on prostate tumor histology in a cohort of male health professionals. *American Journal of Epidemiology*. 2023. (Accepted).
b. **Iyer HS**, Hart JE, Fiffer MR, Elliott EG, Yanosky JD, Kaufman JD, Puett RC, Laden F. (2022). Impacts of long-term ambient particulate matter and gaseous pollutants on circulating biomarkers of inflammation in male and female health professionals. *Environ Res* 2022 Jul 4; 214(Pt 1):113810. PMID: 35798268.
c. **Iyer HS**, Hart JE, James P, Elliott EG, DeVille NV, Holmes MD, De Vivo I, Mucci LA, Laden F, Rebbeck TR. Impact of neighborhood socioeconomic status, income segregation, and greenness on blood biomarkers of inflammation. *Environment International*. 2022 Apr 1;162:107164. PMCID: PMC8985077.
d. **Iyer HS**, James P, Valeri L, Bajunirwe F, Nankya-Mutyoba J, Njelekela M, Chiwanga F, Sewram V, Ajayi I, Adebamowo C, Dalal S, Reid TG, Rebbeck TR, Adami HO, Holmes MD. Neighborhood greenness and burden of non-communicable diseases in Sub-Saharan Africa: A multi-country cross-sectional study. *Environ Res*. 2021 May;196:110397. doi: 10.1016/j.envres.2020.110397. Epub 2020 Oct 31. PMID: 33130166; PMCID: PMC8085185.

4. Evaluating geographic access to diagnostics and cancer care

Access to diagnostics is inequitably distributed globally. Low- and middle-income countries face large deficits in infrastructure, staff, and medicines required for projected demand for diagnostics for cancer and other chronic diseases. I collaborated with the Lancet Commission on Diagnostics, a global panel of experts aiming to increase access to high-quality diagnostics worldwide. I proposed a novel conceptual framework that allows evaluation of trade-offs between rural-urban equity in accessing primary care and cancer diagnostics and efficient service delivery. We applied this framework with colleagues in Tanzania to show that while the geographic distribution of access to diagnostics across health systems levels is

equitable, access to tertiary care is unacceptably long in rural areas. Our work supported policymakers' selected area for building a new tertiary care center. These studies illustrate my expertise in geospatial analysis.

a. Bhangdia KP, **Iyer HS**, Joseph JP, Dorne L, Mukherjee J, Fadelu T. (2021). Comparing absolute and relative distance and time travel measures of geographic access to healthcare facilities in rural Haiti. *BMJ Open* 2022*;* May 24; 12(5):e056123; PMCID: PMC9174809.
b. **Iyer HS**, Wolf NG, Flanigan JS, Castro MC, Schroeder LF, Fleming K, Vuhahula E, Massambu C. Evaluating urban-rural access to pathology and laboratory medicine services in Tanzania. *Health Policy Plan*. 2021 Aug 12;36(7):1116-1128. doi: 10.1093/heapol/czab078. PMID: 34212191; PMCID: PMC8359747.
c. Fleming KA, Horton S, Wilson ML, Atun R, DeStigter K, Flanigan J, Sayed S, Adam P, Aguilar B, Androniko S, Boehme C, Cherniak W, Cheung ANG, Dahn B, Donoso L, Douglas T, Garcia P, Hussain S, **Iyer HS**, Kohli M, Labrique AB, Looi LM, Meara J, Nkengasong J, Pai M, Pool KL, Ramaiya K, Schroeder L, Shah D, Sullivan R, Tan BS, Walia K. (2021). The Lancet Commission on Diagnostics: Transforming access to diagnostics. *Lancet*. 2021 Nov 27; 398(10315): 1997-2050; PMCID: PMC8494468.
d. **Iyer HS**, Flanigan J, Wolf NG, Schroeder LF, Horton S, Castro MC, Rebbeck TR. Geospatial evaluation of trade-offs between equity in physical access to healthcare and health systems efficiency. *BMJ Glob Health*. 2020 Oct;5(10):e003493. doi: 10.1136/bmjgh-2020-003493. PMCID: PMC7580044.

Complete List of Published Work in My Bibliography:
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