Shattering the monolith: burden of gastrointestinal cancer in Asian Americans, Native Hawaiians, and Pacific Islanders in the United States

Ji Yoon Yoon,[a] Shailja C. Shah,[b,c] Jenny J. Lin,[d] Michelle Kang Kim,[e] Steven H. Itzkowitz,[a] and Christina P. Wang[a,*]

[a]Dr. Henry D. Janowitz Division of Gastroenterology, Icahn School of Medicine at Mount Sinai, New York, NY, USA
[b]GI Section, VA San Diego Healthcare System, San Diego, CA, USA
[c]Division of Gastroenterology, University of California San Diego, San Diego, CA, USA
[d]Division of General Internal Medicine, Icahn School of Medicine at Mount Sinai, New York, NY, USA
[e]Department of Gastroenterology, Hepatology and Nutrition, Cleveland Clinic, Cleveland, OH, USA

The Lancet Regional Health - Americas 2025;41: 100954

Published Online xxx
https://doi.org/10.1016/j.lana.2024.100954

Summary

Asian Americans remain the fastest-growing racial group in the United States, and are anticipated to double over the next few decades. Asian Americans are the only major racial-ethnic group for whom cancer remains the leading cause of death, and multiple gastrointestinal cancers rank among the top five incident and fatal cancers. Most research to date presents Asian Americans, Native Hawaiians, and Pacific Islanders (AANHPI) in aggregate, overlooking their vast heterogeneity and hindering efforts to identify and address health disparities within AANHPI origin groups. Here, we present gastrointestinal cancer incidence and mortality in AANHPI, including disaggregated rates where feasible, and highlight gaps in current screening practices. We conclude with actionable suggestions to shift away from using broad racial categories to evaluate cancer disparities, towards high-quality, disaggregated data to better isolate and address factors driving the clear differential cancer risks among AANHPI.

Keywords: Asian American Native Hawaiian and Pacific Islander; Gastrointestinal neoplasms; Esophageal neoplasms; Stomach neoplasms; Liver neoplasms; Pancreatic neoplasms; Colorectal neoplasms; Health inequities; Early detection of cancer

Asian Americans (AA) are the fastest-growing single racial or ethnic group in the United States (US), followed by Hispanic Americans, and Native Hawaiians/Pacific Islanders,[1,2] who rank second and third in population growth, respectively.[3] Cancer is the leading cause of death among AA and includes potentially preventable gastrointestinal (GI) cancers,[4,5] in contrast to other major race-ethnicity groups (non-Hispanic White [NHW], non-Hispanic Black [NHB], Hispanic), for whom cardiovascular disease is the leading cause of death.[5]

Broad racial categories ("AANHPI") obscure understanding of cancer risk and disparities

AANHPI is a nebulous, sociological description that encompasses over 40 distinct ethnic groups (henceforth referred to as 'origin groups'), and is defined as a "person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent or the Pacific Islands."[6] Unfortunately, the term overlooks the vast heterogeneity across lifestyles, dietary and cultural practices, health beliefs, socioeconomic status, English proficiency, acculturation, and immigration patterns.[4] Its use to categorise diverse populations and to describe cancer disparities is inherently problematic, as it inadequately captures the heterogeneity and confluence of biological, environmental, and behavioural factors that shape cancer risk and outcomes.[7] Yet, in the absence of more precise, race-agnostic biomarkers of disease, rigorous analysis and mitigation of racial-ethnic disparities is necessary.

One key barrier is that most publications present AANHPI in aggregate, obscuring efforts to identify and correct health disparities within AANHPI origin groups.[8] Cancer interception strategies require investigation of the underlying determinants of disease. Immigration is the primary driver of AANHPI population growth, and migration of individuals from countries with high levels of infectious carcinogens or other exposures bears implications for GI cancer incidence and mortality trends.[3] With immigration and acculturation, exposures and cancer incidence in migrant

*Corresponding author. Division of Gastroenterology, Icahn School of Medicine at Mount Sinai, One Gustave L. Levy Place, Box 1069, New York, NY, 10029, USA.
E-mail address: christina.wang@mountsinai.org (C.P. Wang).

populations may shift towards those of the host population (as observed with colorectal cancer [CRC] and gastric cancer [GC]), a phenomenon known as the 'migrant effect.[9] Thus, evaluation of AANHPI by origin group and other relevant factors (i.e., immigrant generation, acculturation, socioeconomic status) are crucial to better define and differentiate modifiable and fixed exposures.

Reporting of cancer statistics, risk factors, and screening practices in disaggregated AANHPI groups is challenging for several reasons: 1) incomplete or inaccurate demographic details are recorded in cancer registries, medical records, and survey data, 2) population figures for smaller AANHPI origin groups are not readily available, and 3) smaller, disaggregated case counts can lead to unstable year-on-year estimates.[2] Despite these limitations, characterization of disaggregated epidemiologic trends is needed to inform more equitable risk-based approaches to cancer screening and guide cancer reduction efforts among heterogeneous populations.

In this Personal View, we examine the burden of GI cancers in AANHPI, providing disaggregated data where possible, with respect to NHW Americans and current US screening guidelines. We also offer recommendations on practices to improve data collection/quality and cancer interception strategies for this diverse population.

Screening and interception efforts fall short of addressing the heterogeneous burden of GI cancer in AANHPI

Oesophageal cancer

The two main histologic types of oesophageal cancer (EC) are oesophageal adenocarcinoma (EAC) and oesophageal squamous cell carcinoma (ESCC). EAC accounts for approximately 60% of EC within the US. Screening is recommended for EAC or its precursor Barrett's oesophagus in individuals with a history of chronic gastroesophageal reflux disease with additional risk factors, including age >50 years, White race, male sex, obesity, tobacco smoking, and family history of EAC or Barrett's esophagus.[10] These guidelines reflect EAC's recent rise, particularly among NHW men, which has gained substantial attention.[10,11]

Worldwide, 80% of new EC cases are diagnosed in Asia, with incidence in East Asia approximately 9-fold greater than in North America.[12] ESCC represents the vast majority of EC cases in East Asia (>90%), versus EAC which is predominant in North America.[12] ESCC is dominant in South Asia whereas EAC is predominant in Polynesia.[13] Reflective of the primary EC histology in most AANHPI origin countries, ESCC accounts for the majority of EC in most disaggregated AANHPI groups, in contrast to NHW Americans for whom EAC predominates.[14,15] Thus, ESCC risk within AANHPI is heterogenous and underappreciated. Indeed, disaggregated analysis shows that the incidence of ESCC in South and Southeast AA approaches EAC incidence in NHW populations.[14]

AA are more likely to be diagnosed with advanced-stage EC and have worse survival than NHW individuals.[16] Despite these clear disparities, EC screening guidelines overlook the established, disproportionate burden of ESCC in AANHPI and probable elevated risk in migrants from high-ESCC incidence countries (Table 1; Supplementary Table S1), instead focusing on EAC risk and mitigation efforts in NHW Americans. To this end, ESCC screening is only recommended for individuals with certain conditions such as Fanconi's anaemia, a rare genetic disorder.[17] Evaluating high-risk populations in the US who might benefit from ESCC screening, in addition to EAC, presents an opportunity to improve inclusion and equity in EC prevention.

Gastric cancer

GC is the 5th most common cancer worldwide and ranks among the five most common cancers in AANHPI.[1] Noncardia GC represents the majority of GC in the US and worldwide and is the primary focus of this section.[24] Immigrants from high- (e.g., East Asia) to low-incidence regions (e.g., US) and their descendants maintain an elevated risk of GC compared to the low-incidence host population.[25] Overall, there is a >2-fold risk of GC across all AA groups compared to NHW Americans, however, there is significant heterogeneity in GC risk when AANHPI are disaggregated by origin group.[26] For example, the relative risk of GC is over 10-fold greater in Korean versus NHW Americans, while a 4-6-fold greater risk is observed in other AA origin groups, including Chinese, Japanese, Vietnamese, and Southeast AA (i.e., Cambodian, Hmong, Laotian, Thai).[24,26] Among Native Hawaiians and Pacific Islanders, the incidence of GC is greater in Native Hawaiian and Samoan men than in NHW counterparts.[27] Even within these origin groups, there is significant heterogeneity by sex (higher risk in men),[14] and known risk factors, such as *Helicobacter pylori* infection, smoking, and diet, are likely to vary by immigrant generation and degree of acculturation.[25]

Within the US, GC is detected at an advanced stage and carries a poor prognosis—69% are diagnosed at a regional or distant stage, with 32% and 6% 5-year survival, respectively.[24] In South Korea and Japan, the implementation of nationwide primary (*H. pylori* screening/eradication) and secondary (e.g., endoscopic screening for early neoplasia) prevention efforts have led to reduced GC mortality and an increased proportion of early-stage cancers at diagnosis (stage shift).[24,28,29] By contrast, in the absence of organized primary and secondary prevention efforts, AANHPI have more advanced-stage GC at diagnosis and, consequently, worse survival, compared to native counterparts in their

Cancer type	Cancer incidence, by sex (95% CI)[a,18]		Cancer mortality, by sex (95% CI)[a,18]		Summary of screening and surveillance guidelines in the United States
	AANHPI	NHW	AANHPI	NHW	
Esophageal adenocarcinoma	M: 1.1 (1.0–1.2) F: 0.2 (0.1–0.2)	M: 6.4 (6.3–6.5) F: 0.9 (0.9–1.0)	M: 2.6 (2.5–2.8) F: 0.7 (0.6–0.8)	M: 7.5 (7.4–7.6) F: 1.5 (1.5–1.5)	Screening endoscopy for patients with chronic gastroesophageal reflux disease and 3 or more risk factors for BE: male sex, age >50 years, White race, tobacco smoking, obesity, family history of BE or EAC in a first-degree relative. Surveillance interval determined by length of BE segment and histologic findings. (ACG, 2022)[10]
Esophageal squamous cell carcinoma	M: 2.2 (2.1–2.4) F: 0.7 (0.7–0.8)	M:1.3 (1.2–1.3) F: 0.8 (0.7–0.8)			Patients with tylosis, lye-induced strictures, Fanconi's anemia would benefit from endoscopic screening. (AGA, 2005)[17]
Gastric	M: 12.1 (11.7–2.4) F: 6.9 (6.7–7.2)	M: 7.5 (7.4–7.6) F: 3.7 (3.7–3.8)	M: 5.4 (5.2–5.6) F: 3.3 (3.1–3.4)	M: 2.8 (2.7–2.8) F: 1.4 (1.4–1.5)	Screening endoscopy in first-generation US immigrants from high-risk regions (e.g., Korea, Japan, China, Russia, South America) may be considered, especially if there is a family history of GC in a first-degree relative. Interval not established. (ASGE, 2015)[19] Surveillance of incidentally-detected GIM in individuals at higher risk of GC (incomplete or extensive GIM, family history of GC, racial-ethnic minorities, immigrants from high-incidence regions) (AGA, 2020)[20]
Liver and intrahepatic bile duct	M: 17.4 (16.9–17.8) F: 6.4 (6.2–6.7)	M: 11.2 (11.1–11.3) F: 4.3 (4.2–4.3)	M: 11.8 (11.4–12.1) F: 5.1 (4.9–5.3)	M: 8.4 (8.4–8.5) F: 3.8 (3.7–3.8)	Abdominal ultrasound and AFP every 6 months for patients with cirrhosis, non-cirrhotic chronic hepatitis B sub-groups (from endemic country, family history of HCC, or high risk as determined by PAGE-B score) (AASLD, 2023)[21]
Pancreas	M: 10.9 (10.6–11.3) F: 9.4 (9.1–9.7)	M: 16.0 (15.8–16.1) F: 11.9 (11.8–12.1)	M: 8.4 (8.1–8.6) F: 7.2 (6.9–7.4)	M: 13.2 (13.2–13.3) F: 9.8 (9.7–9.9)	Annual screening (MRI or endoscopic ultrasound) in patients harboring a germline mutation associated with exocrine pancreatic cancer (e.g., CDKN2A, STK11), or meeting criteria for familial pancreatic cancer (NCCN, 2020)[22]
Colorectal	M: 34.5 (33.8–35.1) F: 25.3 (24.8–25.7)	M: 42.0 (41.8–42.3) F: 32.4 (32.2–32.6)	M: 10.9 (10.6–11.2) F: 7.7 (7.5–7.9)	M: 15.2 (15.1–15.3) F: 10.9 (10.8–10.9)	All adults aged 45–75 years. Interval dependent on screening modality (USPSTF, 2021)[23]

M: male, F: female. AANHPI, Asian American Native Hawaiian Pacific Islander; AASLD, American Association for the Study of Liver Diseases; ACG, American College of Gastroenterology; AGA, American Gastroenterological Association; ASGE, American Society for Gastrointestinal Endoscopy; BE, Barrett's esophagus; EAC, esophageal adenocarcinoma; GC, gastric cancer; GIM, gastric intestinal metaplasia; HCC, hepatocellular carcinoma; NCCN, National Comprehensive Cancer Network; NHW, non-Hispanic White; US, United States; USPSTF, United States Preventative Services Task Force. Note: We report incidence in aggregated AANHPI from a single source, to allow direct comparison across groups. The range of GI cancer incidence and mortality in disaggregated AANHPI origin groups, derived from multiple sources, is presented in the Supplementary Table. [a]Age-adjusted rate per 100,000 person years; via SEER*Explorer.[18]

Table 1: **GI cancer incidence and mortality in AANHPI compared to NHW Americans (reference population), stratified by sex.**

countries of origin.[9,24] Disaggregated analyses unveil additional concerning disparities —Native Hawaiians and Pacific Islanders present at younger ages, at more advanced stages, and demonstrate worse survival compared to NHW or Asian counterparts.[30]

Despite dedicated advocacy efforts in the US, GC prevention has remained a challenge to achieve.[28] The American Society of Gastrointestinal Endoscopy *suggests* screening endoscopy in first-generation immigrants age >40 years from high-risk regions for GC (e.g., East Asia, Russia, South America),[24] acknowledging the heterogeneity of GC risk in the US and the impact of established GC screening programs on mortality in high-incidence countries.[29] However, implementation of this recommendation has been extremely limited, which likely reflects the lack of data for screening practices in the US, hand-in-hand with low baseline awareness of groups at increased risk.

In the US, endoscopic surveillance for *incidentally-detected* gastric intestinal metaplasia (GIM) is advised in high-risk cohorts. GIM is a pre-neoplastic condition associated with an increased risk of gastric adenocarcinoma, analogous to Barrett's oesophagus and EAC. At-risk groups include individuals with a family history of GC, members of racial-ethnic minority groups or immigrants, and high-risk findings on upper endoscopy, albeit with limited evidence.[20] Importantly, once established, the risk of GIM progression appears to be independent of race-ethnicity. This underscores the need to tailor surveillance efforts using a race-agnostic, risk-stratified approach (e.g., based on GIM extent, severity, subtype).[31] The rationale for GIM surveillance is that, at least in individuals at increased risk of progression, surveillance offers the opportunity to detect GC at an early stage where resection is curative.[24] Unfortunately, there are currently no recommendations in the US that identify populations harbouring GIM who may benefit from endoscopic screening (i.e., true screening versus surveillance of incidentally-diagnosed GIM).

Endoscopic screening for GC appears to be cost-effective in high-risk groups (e.g., Asian and Hispanic Americans) based on modelling studies.[32] Furthermore,

EC and GC can be simultaneously screened for using the same modality (i.e., upper endoscopy).[33] However, prior to widespread implementation, improved risk stratification for all cancers that can be detected by upper endoscopy, increased training efforts to better identify pre-cancerous lesions, and comprehensive evaluation of the potential benefits versus harms, economic costs, and resource utilization of identified screening strategies, are necessary.

Liver cancer

The American Association for the Study of Liver Diseases advises screening for hepatocellular carcinoma (HCC), the most prevalent type of primary liver cancer, in at-risk groups, such as individuals (men >40 years, women >50 years) with chronic Hepatitis B from endemic regions (e.g., North/Southeast/East Asia) or with cirrhosis from any cause.[21] Within the US, the aetiology of HCC varies by origin group, where targeted disease surveillance and screening should be considered. Among AA, Hepatitis B (e.g., Chinese, Korean, South Asian, Southeast Asian), Hepatitis C (e.g., Japanese, South Asian, and Vietnamese), and metabolic dysfunction-associated steatotic liver disease (e.g., Filipino) drive HCC burden.[34] While AA have a significantly higher incidence of HCC than NHW, NHB, and Hispanic Americans, incidence varies drastically among disaggregated groups, particularly among Southeast AA (i.e., Vietnamese, Cambodian, and Laotian) where the burden is > 2 times other AA groups, and nearly 10-fold greater than their NHW counterparts.[35]

Worldwide, liver cancer is projected to decline in high-incidence regions (i.e., East/Southeast Asia) through 2030, largely guided by declining HCC incidence and public health initiatives to combat Hepatitis B and C infections.[36] Interestingly, the incidence of intrahepatic cholangiocarcinoma will plateau —Thailand is an exception where, due to a significant increase in cholangiocarcinoma from liver flukes, liver cancer incidence is climbing.[36] Low-incidence countries (e.g., the US) are expected to experience >3-fold rise in overall liver cancer incidence, driven partly by immigration.[36] AANHPI have the highest risk of intrahepatic cholangiocarcinoma across all major race-ethnicity groups, with a 40% excess risk compared to NHW Americans and increasing incidence over time.[37,38] Investigation of less common cancers in smaller cohorts is challenging, and consequently, detailed data on cholangiocarcinoma is lacking in disaggregated AANHPI origin groups. Given these obstacles and the significant lag from exposure to cancer presentation, proactive education of healthcare providers (especially in at-risk communities), may be a nearer-term solution.

Although prior studies suggest that liver cancer survival is higher in AANHPI than in other race-ethnicity groups, disaggregated findings reveal important disparities.[39] Compared to NHW individuals, Laotian and Filipino patients are more likely to have advanced-stage liver cancer, while Kampuchean and Laotian patients have higher liver cancer-specific mortality.[39] Among Pacific Islanders, Samoans, Tongans, Guamanians, and Fijians are diagnosed at more advanced stages and have higher liver cancer mortality than NHW Americans.[40,41]

Pancreatic cancer

Pancreatic cancer incidence in AANHPI overall is significantly lower than in NHW and NHB Americans.[42] Again, disaggregated data paints a vastly heterogeneous picture, where incidence is greatest in Japanese and Korean Americans, rivalling that of NHW counterparts. Rising incidence has also been observed in several AANHPI (i.e., Korean, Japanese, Chinese, Filipino, and South Asian) origin groups.[42] In Native Hawaiian women, pancreatic cancer is the fifth most common cancer.[27] Despite having lower pancreatic cancer incidence than NHW individuals, Japanese and Korean Americans have the highest pancreatic cancer mortality rates, on par with mortality rates in NHW groups.[41]

Screening for pancreatic cancer is not recommended in average-risk individuals.[23] Germline genetic testing is advised in patients diagnosed with pancreatic cancer (or their first-degree relatives) to identify individuals harbouring pathogenic germline variants or families that meet criteria for familial pancreatic cancer as high-risk groups who may benefit from annual surveillance.[22] Unfortunately, AA and other minoritized populations remain less likely to undergo germline testing, and further efforts to investigate and address these barriers are needed.[43]

Colorectal cancer

CRC is the third most common cancer among new cancer cases and ranks among the top five causes of cancer death in the US.[44] While the incidence of CRC is highest in NHB and lowest in AANHPI populations, disaggregated analyses reveal a burden of CRC in Japanese and Pacific Islander men that rivals incidence in NHB counterparts.[14] Among Pacific Islanders, Samoans and Guamanians/Chamorro have experienced a rise in incidence that contrasts with the decline observed in NHW groups.[25] Among disaggregated AANHPI groups, CRC is the leading cause of cancer for Hmong, Cambodian, Laotian, and Papua New Guinean individuals.[45] While South Asian Americans have lower CRC incidence compared to the NHW population, they are diagnosed at more advanced stages and experience greater treatment delays compared to their NHW counterparts.[46] Advanced-stage CRC represent the bulk of CRC diagnosed in AANHPI, and are greatest (nearly 65% of CRCs) among Korean and Southeast AA.[45,47] While CRC- mortality rates are lower in AANHPI than

in NHW groups overall, Southeast AA, Native Hawaiians and Pacific Islanders have worse mortality compared to NHW counterparts.[41,48]

The United States Preventative Services Task Force recommends CRC screening in adults aged 45–75 years, with shared decision-making thereafter.[23] Adoption of these guidelines has led to significant declines in CRC incidence and mortality.[49] Unfortunately, AANHPI consistently have low CRC screening rates,[50,51] and compared to US-born peers, foreign-born AANHPI (with the exception of US-born Japanese men) experience higher mortality rates from screening-preventable cancers.[52] Prior literature demonstrates that multipronged barriers exist at the system- (e.g., difficulties navigating the healthcare system), provider- (e.g., lack of physician recommendation), and patient-level (e.g., under-perception of cancer risk), and will likely differ across AANHPI populations.[51]

Alarmingly, early-onset CRC is now the first and second leading causes of cancer death in men and women <50 years old, respectively, in the US.[44] AANHPI (and other minority groups) experience a two-fold greater risk, more advanced disease at diagnosis, and worse 5-year relative survival compared to NHW Americans.[53,54] The persistence of racial-ethnic disparities in cancer outcomes even in younger cohorts is particularly concerning and requires further investigation.

Immigration, acculturation, and social determinants of health: moving beyond racial categorisation

As outlined above, disaggregated analysis by AANHPI origin group unmasks significant disparities across the cancer continuum and is critically important to understand and mitigate risk. Beyond origin group, immigrant generation and degree of acculturation further contribute to differences in exposures (e.g., carcinogenic infectious agents, smoking, obesity). The "migrant effect" has been observed for GC in Japanese migrants with the risk of GC reduced by approximately one-third for each successive generation residing in the US.[9] This effect likely exists for other cancers but due to a lack of nativity/immigration data in cancer registries, well-designed studies that evaluate the impact of immigrant generation and its interaction with other risk factors are challenging and essentially non-existent.

For GC and liver cancer, carcinogenesis is strongly driven by the infectious agents *H. pylori* and Hepatitis B, respectively. Given the preventable and treatable nature of these pathogens, further efforts to better understand and target communities bearing these burdens are strongly warranted.[55] *H. pylori* is the leading cause of infection-associated cancers due to its pivotal role in GC carcinogenesis, and is recognised as a class 1 carcinogen by the World Health Organization.[56] 80% of global GC incidence is attributed to *H. pylori*, and differences in its prevalence and virulence factors (e.g., *cagA, vacA* genotypes) between populations account for a large proportion of the variation in GC incidence worldwide.[19,57] *H. pylori* prevalence in the US is approximately 17%, in contrast to much higher rates observed in Asia (e.g., South Korea (55%), India (60%)).[58] Marked racial-ethnic disparity in *H. pylori* burden is evident within the US, and while prevalence data is sparse in AANHPI, it may reach as high as 70% for Asian-born groups.[59,60] Furthermore, while strong links between *H. pylori* and GC are noted in many East Asian countries, low GC rates are observed in South Asia (e.g., India, Bangladesh) despite high *H. pylori* prevalence. This "Asian enigma" reflects the multifactorial nature of GC carcinogenesis, and insights into genetic diversity, host–pathogen interaction, and additional environmental exposures, is limited in the absence of disaggregated data.[61]

Similarly, chronic Hepatitis B is the primary driver of liver cancer within Asia and among foreign-born AA, where liver cancer incidence is five times greater than for US counterparts.[62] While chronic Hepatitis B prevalence in the US is <0.5%, the prevalence is 8-fold higher among AA.[63] A decline in liver cancer risk due to chronic viral infections has been observed in Asia, however globalization and urbanization have led to lifestyle and dietary patterns that may shift the HCC landscape.[36] A subsequent rise in obesity (notable in China, Japan and India) and metabolic dysfunction-associated steatotic liver disease (up to 2-fold greater prevalence among individuals with BMI <25 residing in Asia versus Western regions) has been observed.[64] These trends require heightened attention and tailored, preventive efforts for at-risk migrant populations, as Asian individuals are more likely to develop obesity-associated complications at a lower BMI.

Data disaggregation is essential to investigate the impact of the social determinants of health on the differential prevalence of cancer risk factors among AANHPI origin groups.[62] While non-modifiable variables (genetics, gene–environment interaction) are not well understood, more data are available to define modifiable exposures in AANHPI. For instance, differences in smoking, heavy alcohol use, and hot liquid consumption influence the heterogeneity observed in ESCC incidence.[12] Although ESCC burden is greater in East Asia compared to the US, when stratified by nativity, ESCC incidence is surprisingly higher in US- versus foreign-born Asians.[15] Here, acculturation does not appear advantageous; tobacco use is higher in AA who are US-born (versus recent immigrants), and a five-fold rise in alcohol use disorder among AA has been documented within a single decade (1991–2002), where individuals with higher levels of acculturation are at greater risk of alcohol misuse.[65] Neighbourhood and social/community context are similarly associated with cancer risk: non-cardia GC and liver cancer incidence

are higher among AA residing in areas of low neighbourhood socioeconomic status, and in more ethnically concentrated enclaves, likely reflecting differential exposures and healthcare access.[62] A more granular understanding of the impact of the social determinants of health on modifiable risk within individual AANHPI groups invites opportunities for enhanced cancer mitigation in these communities.

Recommendations

To better explore and address the burden of GI cancer in AANHPI, we suggest the following.

- *Apply disaggregation across the data "life cycle"*

The lack of disaggregation in federal data collection has been acknowledged for its role in perpetuating stereotypes and masking disparities.[8] Only recently has there been legislation to address this key oversight. In 2021, the Biden-Harris administration released an Executive Order ("Equity EO"), which recommends disaggregation throughout the data "life cycle," including collection, analysis, dissemination, and protection of data (Fig. 1).[66] The US Census Bureau has collected and reported disaggregated race-ethnicity data since 2010, which is widely used by policymakers, non-governmental and business organizations to inform decision making.[67] This practice is now extended through the revised Office of Management and Budget Statistical Policy Directive 15 (SPD 15, effective March 2024), which regulates government-wide standards to require disaggregated data collection of origin group details beyond broad race-ethnicity categories.[68]

Such data collection benchmarks will help uncover a deeper understanding of the cancer inequities that exist in marginalized communities. Furthermore, it is important to recognize that inequities exist across the entire cancer continuum and that data disaggregation efforts will also be crucial towards unveiling disparities in treatment, survivorship, and end-of-life. While federal agencies are expected to implement SPD 15 immediately for any new data collection and create action plans within the next 12 months for ongoing efforts, state agencies that follow federal reporting guidelines are likely to take much longer to implement these guidelines.[6] Some states, however, have led the charge. California and New York require state agencies to collect more detailed data on AANHPI origin groups, and Massachusetts and Michigan have developed collection forms that allow for additional race-ethnicity reporting, far in advance of SPD 15.[69]

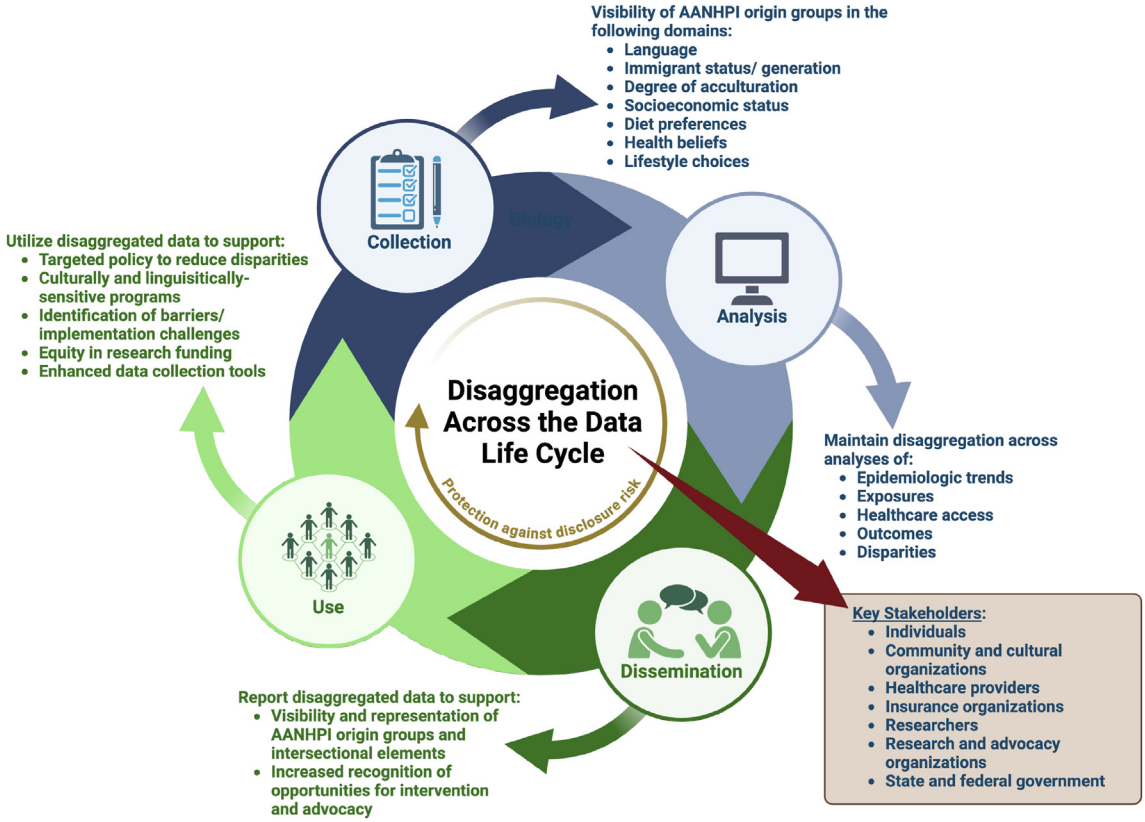

Fig. 1: Disaggregation across the data life cycle.

The above efforts are not cancer-directed, and advocacy to extend disaggregation in data collection across state and national-level cancer registries is necessary to fill knowledge gaps. Well-defined and publicly accountable implementation targets at federal and state levels are warranted, and these long-term efforts should be protected through legislation. Importantly, data disaggregation should not be limited to a top-down approach. Particularly for clinical data where tributaries are health systems, widespread disaggregation at the institution level using comprehensive lists of race-ethnicity groups will reduce the lag in building high-quality, national, disaggregated databases.[70] Waiting for state- or county-level mandates to begin such work would be a missed opportunity. Finally, careful management of risks associated with identification is required when reporting disaggregated data, which leaves smaller groups especially vulnerable. We may consider strategies to enhance privacy by increasing the size of reporting units (e.g., collapse geographic units, use broader age categories like decades). Other methods that allow maximal disaggregation while protecting subjects from identification will also need to be developed.

- *Improve data quality of contributory and intersectional factors*

To mitigate (and ideally eliminate) the reliance on race-ethnicity as a proxy for cancer risk, high-quality, disaggregated data that explore important contributory elements (e.g., ancestry, immigration status, non-genetic exposures, gene–environment interactions, social determinants of health) are sorely needed. For instance, genome-wide association studies (GWAS) have identified 8 additional susceptibility loci for CRC in individuals of East Asian descent compared to those of European descent.[71] Given that >78% of GWAS participants are of European descent, greater representation of AANHPI groups are essential for individuals to benefit from precision oncology regardless of their ancestry.[72,73] Additionally, robust instruments that assess risk factors, dietary practices, and health beliefs/behaviours must be developed, culturally tailored, and validated across ethnic groups. While it is crucial to enhance our knowledge of the individual determinants of disease, a more nuanced comprehension of cancer risk arises from the appreciation that individuals are also shaped by intersecting factors (e.g., age, sex, race/ethnicity, socioeconomic status, nativity, level of acculturation).

- *Design and implement linguistically- and culturally-sensitive cancer prevention programs*

Disaggregation not only enables a detailed evaluation of differential risk and cancer burden in communities as above, but it also supplies crucial data to identify barriers and effectively target gaps in cancer care. Despite established national and international guideline support, CRC screening remains underutilized by AA. While socioeconomic and healthcare factors explain CRC screening patterns among more established NHW, NHB, and Hispanic immigrants, foreign-born AANHPI experience low screening uptake regardless of time spent in the US.[50,51] Disaggregation is critical for exploring factors (e.g., cultural health beliefs, preference for traditional health practices) that may be particularly relevant for AANHPI groups and differences in health behaviours that sociodemographics alone fail to explain.

The Filipino-American Health Study is an example of a culturally-tailored cancer control program that successfully increased CRC screening rates among Filipino Americans.[74] The multi-component intervention involved education sessions led by Filipino health educators, bilingual print materials, and personalized reminders, resulting in >3 times odds of CRC screening in those who received the intervention. The importance of culturally- and linguistically-tailored interventions cannot be understated, as they are more likely to be accepted and effective, and this approach should be considered for all prevention efforts.

- *Critical evaluation of funding priorities for cancers affecting AANHPI*

Funding is essential to: 1) build higher-quality, intersectional, disaggregated data to support our understanding of the cancer burden in this heterogenous population, and 2) address already-identified disparities with epidemiologic, translational, or implementation research.

Federal funding for research demonstrates a major schism for cancers with high lethality in minoritized populations. In an analysis of National Cancer Institute funding for common cancers, GC and EC were found to have the lowest funding-to-lethality ratios (a measure of funding disparity), ranking last among all cancer types (i.e., 18th for GC and 19th for EC).[75] Funding-to-lethality ratios ranged over 100-fold across cancer types, with the highest ratios observed for breast and prostate cancer (i.e., abundant funding in comparison to low lethality). Additionally, funding was highly correlated with the proportion of NHW individuals affected by each cancer type.[75] Greater attention towards a more equitable distribution of federal funding priorities is certainly warranted, as such a shift would ensure research and resources more evenly address the public health concerns of our growing and diverse communities.

Conclusions

By 2065, AA will become the largest immigrant group, with 90% of US population growth propelled by immigrants and their descendants.[3] Cancer is the leading cause of death in AA, and several GI cancers rank

Search strategy and selection criteria

We searched Medline for articles published between 01/01/2001 and 04/01/2024 with "Asian American Native Hawaiian and Pacific Islander" [*MeSH] combined with the following search terms: "Digestive System Neoplasms"*, "Gastrointestinal Cancer", "Esophageal Cancer", "Esophageal Neoplasms"*, "Gastric Cancer", "Stomach Neoplasms"*, "Liver Cancer", "Carcinoma, Hepatocellular"*, "Pancreatic Cancer", "Pancreatic Neoplasms"*, "Colorectal Cancer", and "Colorectal Neoplasms"*. Additionally, we identified US GI or national societies that provide recommendations for GI cancer screening.

among the top five incident and fatal cancers, highlighting opportunities to augment current cancer interception efforts.[4] In response to the rapid growth of minority groups across the US (i.e., Asian and Hispanic Americans), the American Society of Gastrointestinal Endoscopy is the only US GI society to release a consensus that addresses differences in cancer burden among diverse cohorts, which was nearly a decade ago.[19] Unfortunately, the impact of this consensus statement on clinical practice, awareness among patients and providers, and in turn, on patient outcomes with respect to cancer incidence and mortality, has been limited. Efforts to understand and address noted disparities are laudable; however, these statements demonstrate the difficulty of addressing a vastly heterogeneous population. While a uniform approach to screening and prevention is easier to implement and evaluate, parsimonious guidelines make a value judgement of what, how many, and how much disability is important enough for society to address, and conditions that affect minority populations often fall by the wayside in deference to the whole.

Often viewed as a monolith, AANHPI are vastly heterogeneous across origin groups, cultural practices, health beliefs and preferences, and acculturation, among other variables, and also experience the largest income inequality of any major racial group.[52] The stereotype of AANHPI as 'the model minority' (i.e. high-achievers relative to the US population) masks cancer disparities and diminishes perception of need, resulting in negative downstream effects across the cancer continuum.[51] If the objective is to tailor preventive measures to increasingly specific, intersectional groups (and eventually, the individual), in the immediate term it is essential to move beyond the categorization of AANHPI as one monolithic group. Instead, we must aspire for greater granularity and precision when defining risk and designing intervention strategies if we are to make meaningful strides towards cancer equity. We will be stronger and healthier for it.

Contributors

JYY–Conceptualization, Investigation, Methodology, Project administration, Validation, Visualization, Writing–original draft, Writing-review & editing; SCS—Conceptualization, Writing-review & editing; JJL–Conceptualization, Writing-review & editing; MKK–Writing-review & editing; SHI–Conceptualization, Writing-review & editing; CPW–Conceptualization, Investigation, Methodology, Project administration, Supervision, Validation, Visualization, Writing–original draft, Writing-review & editing.

Declaration of interests

These authors disclose the following: SCS is a consultant for Phathom Pharmaceuticals and RedHill Biopharma, and declares leadership/committee roles in the American College of Gastroenterology and American Gastroenterological Association. SHI reports consulting fees from Exact Sciences. The remaining authors report no relevant disclosures or conflicts of interest related to this article.

Acknowledgements

No direct funding was received for this review. The authors declare the following grant support: JYY receives research salary support from the National Cancer Institute of the National Institutes of Health under Award Number T32CA225617. SCS receives grant support from a Veterans Affairs Career Development Award (ICX002027A). SHI receives research support from Exact Sciences and Freenome. CPW receives grant support from the National Cancer Institute of the National Institutes of Health under Award Number K08CA283362. The content is solely the responsibility of the authors and does not necessarily represent the official views of the funding agencies listed.

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.lana.2024.100954.

References

1 Sengupta R, Honey K. AACR cancer disparities progress report 2020: achieving the bold vision of health equity for racial and ethnic minorities and other underserved populations. *Cancer Epidemiol Biomarkers Prev*. 2020;29(10):1843. https://doi.org/10.1158/1055-9965.EPI-20-0269.
2 Cancer Facts & Figures for Asian American. *Native Hawaiian, and other pacific islander people 2024-2026*. American Cancer Society; 2024.
3 Budiman A, Ruiz NG. *Key facts about Asian Americans, a diverse and growing population*. Pew Research Center; 2021. Available from: https://www.pewresearch.org/short-reads/2021/04/29/key-facts-about-asian-americans/.
4 Thompson CA, Gomez SL, Hastings KG, et al. The burden of cancer in Asian Americans: a report of national mortality trends by Asian ethnicity. *Cancer Epidemiol Biomarkers Prev*. 2016;25(10):1371–1382. https://doi.org/10.1158/1055-9965.Epi-16-0167.
5 Deaths: Leading Causes for 2021. *National vital statistics system*. 2024.
6 National Center for Health Statistics. Sources and definitions: race: centers for disease control updated 6/2023. Available from: https://www.cdc.gov/nchs/hus/sources-definitions/race.html; 2023.
7 Siddique SM, May FP. Race-based clinical recommendations in Gastroenterology. *Gastroenterology*. 2022;162(2). https://doi.org/10.1053/j.gastro.2021.12.234.
8 Liang PS, Kwon SC, Cho I, Trinh-Shevrin C, Yi S. Disaggregating racial and ethnic data: a step toward diversity, equity, and inclusion. *Gastroenterology*. 2023;164(3):320–324. https://doi.org/10.1053/j.gastro.2023.01.008.
9 Maskarinec G, Noh JJ. The effect of migration on cancer incidence among Japanese in Hawaii. *Ethn Dis*. 2004;14(3):431–439.
10 Shaheen NJ, Falk GW, Iyer PG, et al. Diagnosis and management of Barrett's esophagus: an updated ACG guideline. *Am J Gastroenterol*. 2022;117(4):559–587. https://doi.org/10.14309/ajg.0000000000001680.
11 Runge TM, Abrams JA, Shaheen NJ. Epidemiology of Barrett's esophagus and esophageal adenocarcinoma. *Gastroenterol Clin N Am*. 2015;44(2). https://doi.org/10.1016/j.gtc.2015.02.001.
12 Liu CQ, Ma YL, Qin Q, et al. Epidemiology of esophageal cancer in 2020 and projections to 2030 and 2040. *Thoracic Cancer*. 2023;14(1):3. https://doi.org/10.1111/1759-7714.14745.

13 Arnold M, Soerjomataram I, Ferlay J, Forman D. Global incidence of oesophageal cancer by histological subtype in 2012. *Gut*. 2015;64(3). https://doi.org/10.1136/gutjnl-2014-308124.
14 Wang CP, McKinley M, Vu A, et al. Demographic comparison of the burden of endoscopically screenable cancers in the United States. *Gastro Hep Adv*. 2024. https://doi.org/10.1016/j.gastha.2024.01.005.
15 Kim JY, Winters JK, Kim J, Bernstein L, Raz D, Gomez SL. Birthplace and esophageal cancer incidence patterns among Asian-Americans. *Dis Esophagus*. 2016;29(1). https://doi.org/10.1111/dote.12302.
16 Okereke IC, Westra J, Tyler D, et al. Disparities in esophageal cancer care based on race: a National Cancer Database analysis. *Dis Esophagus*. 2022;35(6). https://doi.org/10.1093/dote/doab083.
17 Kenneth K, Wang MW, Buttar Navtej S. American Gastroenterological Association technical review on the role of the gastroenterologist in the management of esophageal carcinoma–PubMed. *Gastroenterology*. 2005;128(5). https://doi.org/10.1053/j.gastro.2005.03.077.
18 Surveillance Research Program NCI. SEER*Explorer: An interactive website for SEER cancer statistics [Internet]. Surveillance Research Program, National Cancer Institute; 2024 Apr 17. [updated: 2024 Jun 27; cited 2024 Jul 21]. Data source(s): Data source(s): SEER Incidence Data, November 2023 Submission (1975-2021), SEER 22 registries. U.S. Mortality Data (1969-2022), National Center for Health Statistics, CDC: National Cancer Institute. Available from: https://seer.cancer.gov/statistics-network/explorer/.
19 Wang A, Shaukat A, Acosta RD, et al. Race and ethnicity considerations in GI endoscopy. *Gastrointest Endosc*. 2015;82(4). https://doi.org/10.1016/j.gie.2015.06.002.
20 Gupta S, Li D, El Serag HB, et al. AGA clinical practice guidelines on management of gastric intestinal metaplasia. *Gastroenterology*. 2020;158(3):693–702. https://doi.org/10.1053/j.gastro.2019.12.003.
21 Singal AG, Llovet JM, Yarchoan M, et al. AASLD Practice Guidance on prevention, diagnosis, and treatment of hepatocellular carcinoma. *Hepatology*. 2023;78(6):1922–1965. https://doi.org/10.1097/HEP.0000000000000466.
22 Daly MB, Pilarski R, Yurgelun MB, et al. NCCN guidelines insights: genetic/familial high-risk assessment: breast, ovarian, and pancreatic, version 1.2020. *J Natl Compr Cancer Netw*. 2020;18(4). https://doi.org/10.6004/jnccn.2020.0017.
23 Recommendation statements, cancer: United States preventative Services Task Force. Available from: https://www.uspreventiveservicestaskforce.org/uspstf/topic_search_results?category%5B%5D=15&searchterm=.
24 Huang RJ, Epplein M, Hamashima C, et al. An approach to the primary and secondary prevention of gastric cancer in the United States. *Clin Gastroenterol Hepatol*. 2022;20(10). https://doi.org/10.1016/j.cgh.2021.09.039.
25 Pabla BS, Shah SC, Corral JE, Morgan DR. Increasing incidence and mortality of gastric cancer in immigrant populations from high to low regions of incidence–a systematic review and meta-analysis. *Clin Gastroenterol Hepatol*. 2020;18(2):347. https://doi.org/10.1016/J.CGH.2019.05.032.
26 Shah SC, McKinley M, Gupta S, Peek RM, Martinez ME, Gomez SL. Population-based analysis of differences in gastric cancer incidence among races and ethnicities in individuals age 50 years and older. *Gastroenterology*. 2020;159(5):1705. https://doi.org/10.1053/J.GASTRO.2020.07.049.
27 Liu L, Noone AM, Gomez SL, et al. Cancer incidence trends among Native Hawaiians and other Pacific Islanders in the United States, 1990-2008. *J Natl Cancer Inst*. 2013;105(15):1086–1095. https://doi.org/10.1093/jnci/djt156.
28 Huang RJ, Koh H, Hwang JH. A summary of the 2020 gastric cancer summit at Stanford University. *Gastroenterology*. 2020;159:1221–1226. https://doi.org/10.1053/j.gastro.2020.05.100.
29 Zhang X, Li M, Chen S, et al. Endoscopic screening in Asian countries is associated with reduced gastric cancer mortality: a meta-analysis and systematic review. *Gastroenterology*. 2018;155(2):347–354.e9. https://doi.org/10.1053/J.GASTRO.2018.04.026.
30 Yoshikawa GT, Simon N, Nakasone RK, et al. Disaggregating data on Pacific Islander gastric cancer patients reveals survival disparity. *J Gastrointest Cancer*. 2021;53(1). https://doi.org/10.1007/s12029-020-00579-6.
31 Gawron AJ, Shah SC, Altayar O, et al. AGA technical review on gastric intestinal metaplasia-natural history and clinical outcomes. *Gastroenterology*. 2020;158(3):705–731.e5. https://doi.org/10.1053/j.gastro.2019.12.001.
32 Saumoy M, Schneider Y, Shen N, Kahaleh M, Sharaiha RZ, Shah SC. Cost effectiveness of gastric cancer screening according to race and ethnicity. *Gastroenterology*. 2018;155(3):648–660. https://doi.org/10.1053/j.gastro.2018.05.026.
33 Hayakawa Y, Sethi N, Sepulveda AR, Bass AJ, Wang TC. Oesophageal adenocarcinoma and gastric cancer: should we mind the gap? *Nat Rev Cancer*. 2016;16(5):305–318. https://doi.org/10.1038/nrc.2016.24.
34 Pinheiro PS, Jones PD, Medina H, et al. Incidence of etiology-specific hepatocellular carcinoma: diverging trends and significant heterogeneity by race and ethnicity. *Clin Gastroenterol Hepatol*. 2024;22(3):562–571.e8. https://doi.org/10.1016/j.cgh.2023.08.016.
35 Pham C, Fong TL, Zhang J, Liu L. Striking racial/ethnic disparities in liver cancer incidence rates and temporal trends in California, 1988-2012. *J Natl Cancer Inst*. 2018;110(11):1259–1269. https://doi.org/10.1093/jnci/djy051.
36 Wu J, Yang S, Xu K, et al. Patterns and trends of liver cancer incidence rates in eastern and southeastern Asian countries (1983–2007) and predictions to 2030. *Gastroenterology*. 2018;154(6). https://doi.org/10.1053/j.gastro.2018.01.033.
37 Gad MM, Saad AM, Faisaluddin M, et al. Epidemiology of cholangiocarcinoma; United States incidence and mortality trends. *Clin Res Hepatol Gastroenterol*. 2020;44(6):885–893. https://doi.org/10.1016/j.clinre.2020.03.024.
38 Ali H, Tedder B, Waqar SH, Mohamed R, Cate EL, Ali E. Changing incidence and survival of intrahepatic cholangiocarcinoma based on surveillance, epidemiology, and end results database (2000-2017). *Ann Hepatobiliary Pancreat Surg*. 2022;26(3). https://doi.org/10.14701/ahbps.21-173.
39 Li DY, VoPham T, Tang M-TC, Li CI. Disparities in risk of advanced-stage liver cancer and mortality by race and ethnicity. *J Natl Cancer Inst*. 2022;114(9):1238–1245. https://doi.org/10.1093/jnci/djac097.
40 Goggins WB, Wong GK. Poor survival for US Pacific Islander cancer patients: evidence from the surveillance, epidemiology, and end results database: 1991 to 2004. *J Clin Oncol*. 2007;25(36):5738–5741. https://doi.org/10.1200/JCO.2007.13.8271.
41 Medina HN, Callahan KE, Morris CR, Thompson CA, Siweya A, Pinheiro PS. Cancer mortality disparities among Asian American and native Hawaiian/Pacific Islander populations in California. *Cancer Epidemiol Biomarkers Prev*. 2021;30(7):1387–1396. https://doi.org/10.1158/1055-9965.Epi-20-1528.
42 Liu L, Zhang J, Deapen D, et al. Differences in pancreatic cancer incidence rates and temporal trends across Asian subpopulations in California (1988-2015). *Pancreas*. 2019;48(7):931–933. https://doi.org/10.1097/mpa.0000000000001337.
43 Kurian AW, Abrahamse P, Furgal A, et al. Germline genetic testing after cancer diagnosis. *JAMA*. 2023;330(1):43–51. https://doi.org/10.1001/jama.2023.9526.
44 Siegel RL, Giaquinto AN, Jemal A. Cancer statistics, 2024. *CA Cancer J Clin*. 2024;74(1):12–49. https://doi.org/10.3322/caac.21820.
45 Bock S, Henley SJ, O'Neil ME, Singh SD, Thompson TD, Wu M. Cancer distribution among Asian, Native Hawaiian, and Pacific Islander subgroups–United States, 2015-2019. *MMWR Morb Mortal Wkly Rep*. 2023;72(16):421–425. https://doi.org/10.15585/mmwr.mm7216a2.
46 Ahmed KS, Marcinak CT, LoConte NK, et al. Colon cancer survival among South Asian Americans: a cross-sectional analysis of a national dataset. *J Surg Res*. 2024;299:269–281. https://doi.org/10.1016/j.jss.2024.04.053.
47 Primm KM, Malabay AJ, Curry T, Chang S. Who, where, when: colorectal cancer disparities by race and ethnicity, subsite, and stage. *Cancer Med*. 2023;12(13). https://doi.org/10.1002/cam4.6105.
48 Ellis L, Canchola AJ, Spiegel D, Ladabaum U, Haile R, Gomez SL. Racial and ethnic disparities in cancer survival: the contribution of tumor, sociodemographic, institutional, and neighborhood characteristics. *J Clin Oncol*. 2018;36(1):25–33. https://doi.org/10.1200/jco.2017.74.2049.
49 Davidson KW, Barry MJ, Mangione CM, et al. Screening for colorectal cancer: US preventive services task force recommendation statement. *JAMA*. 2021;325(19):1965–1977. https://doi.org/10.1001/jama.2021.6238.
50 Santiago-Rodríguez EJ, Shariff-Marco S, Gomez SL, Hiatt RA. Disparities in colorectal cancer screening by time in the U.S. and race/ethnicity, 2010-2018. *Am J Prev Med*. 2023;65(1):74–82. https://doi.org/10.1016/j.amepre.2023.01.033.
51 Shah I, Gawron AJ, Byrne KR, Inadomi JM. Disparities in colorectal cancer screening among Asian American populations and

strategies to address these disparities. *Gastroenterology*. 2024;166(4):549–552. https://doi.org/10.1053/j.gastro.2024.02.009.
52 Tripathi O, He Y, Han BY, et al. Cancer mortality in U.S.-Born versus foreign-born Asian American groups (2008-2017). *Cancer Epidemiol Biomarkers Prev*. 2022;31(1):58–65. https://doi.org/10.1158/1055-9965.Epi-21-0359.
53 Rahman R, Schmaltz C, Jackson CS, Simoes EJ, Jackson-Thompson J, Ibdah JA. Increased risk for colorectal cancer under age 50 in racial and ethnic minorities living in the United States. *Cancer Med*. 2015;4(12):1863–1870. https://doi.org/10.1002/cam4.560.
54 Zaki TA, Liang PS, May FP, Murphy CC. Racial and ethnic disparities in early-onset colorectal cancer survival. *Clin Gastroenterol Hepatol*. 2023;21(2):497–506.e3. https://doi.org/10.1016/j.cgh.2022.05.035.
55 Rositch AF. Global burden of cancer attributable to infections: the critical role of implementation science. *Lancet Global Health*. 2020;8(2). https://doi.org/10.1016/S2214-109X(20)30001-2.
56 Cogliano VJ, Baan R, Straif K, et al. Preventable exposures associated with human cancers. *J Natl Cancer Inst*. 2011;103(24). https://doi.org/10.1093/jnci/djr483.
57 Yamaoka Y, Kato M, Asaka M. Geographic differences in gastric cancer incidence can be explained by differences between Helicobacter pylori strains. *Intern Med*. 2008;47(12):1077–1083. https://doi.org/10.2169/internalmedicine.47.0975.
58 Chen Y-C, Malfertheiner P, Yu H-T, et al. Global prevalence of Helicobacter pylori infection and incidence of gastric cancer between 1980 and 2022. *Gastroenterology*. 2024;166(4). https://doi.org/10.1053/j.gastro.2023.12.022.
59 Brown H, Cantrell S, Tang H, Epplein M, Garman KS. Racial differences in Helicobacter pylori prevalence in the US: a systematic review. *Gastro Hep Adv*. 2022;1(5). https://doi.org/10.1016/j.gastha.2022.06.001.
60 Shah SC, Halvorson AE, Lee D, et al. Helicobacter pylori burden in the United States according to individual demographics and geography: a nationwide analysis of the Veterans Healthcare System. *Clin Gastroenterol Hepatol*. 2024;22(1):42–50.e26. https://doi.org/10.1016/j.cgh.2023.05.016.
61 Miwa H, Go MF, Sato NH. Pylori and gastric cancer: the Asian enigma. *Am J Gastroenterol*. 2002;97(5):1106–1112. https://doi.org/10.1111/j.1572-0241.2002.05663.x.
62 Chang ET, Yang J, Alfaro-Velcamp T, So SK, Glaser SL, Gomez SL. Disparities in liver cancer incidence by nativity, acculturation, and socioeconomic status in California Hispanics and Asians. *Cancer Epidemiol Biomarkers Prev*. 2010;19(12):3106–3118. https://doi.org/10.1158/1055-9965.Epi-10-0863.
63 Kim HS, Rotundo L, Yang JD, et al. Racial/ethnic disparities in the prevalence and awareness of Hepatitis B virus infection and immunity in the United States. *J Viral Hepat*. 2017;24(11):1052–1066. https://doi.org/10.1111/jvh.12735.
64 Fan JG, Kim SU, Wong VW. New trends on obesity and NAFLD in Asia. *J Hepatol*. 2017;67(4):862–873. https://doi.org/10.1016/j.jhep.2017.06.003.
65 Iwamoto DK, Kaya A, Grivel M, Clinton L. Under-researched demographics: heavy episodic drinking and alcohol-related problems among Asian Americans. *Alcohol Res*. 2016;38(1):17–25.
66 *A vision for equitable data–recommendations from the equitable data working group*. 2021.
67 Bureau USC. American Community Survey census.gov: U.S. Census Bureau. Available from: https://www.census.gov/programs-surveys/acs.
68 Revisions to OMB's statistical policy directive No. 15: standards for maintaining, collecting, and presenting federal data on race and ethnicity. In: *Office MaB*. Federal Register; 2024.
69 Rubin V, Ngo D, Ross A, Butler D, Balaram N. Counting a diverse nation: disaggregating data on race and ethnicity to advance a culture of health. *PolicyLink*; 2018. Available from: https://www.policylink.org/sites/default/files/Counting_a_Diverse_Nation_08_15_18.pdf.
70 *Race, ethnicity, and Language data: standardization for health care quality improvement*. 2018.
71 Lu Y, Kweon SS, Tanikawa C, et al. Large-scale genome-wide association Study of East Asians identifies loci associated with risk for colorectal cancer. *Gastroenterology*. 2019;156(5):1455–1466. https://doi.org/10.1053/j.gastro.2018.11.066.
72 Tan DS, Mok TS, Rebbeck TR. Cancer genomics: diversity and disparity across ethnicity and geography. *J Clin Oncol*. 2016;34(1):91–101. https://doi.org/10.1200/JCO.2015.62.0096.
73 Peterson RE, Kuchenbaecker K, Walters RK, et al. Genome-wide association studies in ancestrally diverse populations: opportunities, methods, pitfalls, and recommendations. *Cell*. 2019;179(3):589–603. https://doi.org/10.1016/j.cell.2019.08.051.
74 Maxwell AE, Bastani R, Danao LL, Antonio C, Garcia GM, Crespi CM. Results of a community-based randomized trial to increase colorectal cancer screening among Filipino Americans. *Am J Public Health*. 2010;100(11). https://doi.org/10.2105/AJPH.2009.176230.
75 Haghighat S, Jiang C, El-Rifai W, Zaika A, Goldberg DS, Kumar S. Urgent need to mitigate disparities in federal funding for cancer research. *J Natl Cancer Inst*. 2023;115(10). https://doi.org/10.1093/jnci/djad097.