Commission on Minority Health

Medical Expert Panel on Preventable Cancers:

White Paper

Achieving Equity and Eliminating Preventable Cancer Disparities within Racial and Ethnic Populations

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Ohio Commission on Minority Health
Medical Expert Panel on Preventable Cancer Health Disparities

I. ACKNOWLEDGEMENTS

The Ohio Commission on Minority Health extends its deepest gratitude to the members of the Medical Expert Panel who contributed to the development of this white paper, "Achieving Equity and Eliminating Preventable Cancer Disparities within Racial and Ethnic Populations."

The insights, expertise, and dedication of the 33 medical experts from across Ohio were instrumental in shaping this document. Their critical analysis, thoughtful feedback, and rich discussions provided the foundation for the evidence-based recommendations contained herein. We are immensely thankful for their time, guidance, and commitment to addressing the significant cancer disparities impacting Ohio's racial and ethnic communities.

While the white paper has greatly benefited from the panel's input, the views presented in this final document do not necessarily reflect the decisions, policies, or perspectives of individual panel members or their affiliated organizations, departments, or institutions.

The Commission is especially appreciative of the panel's unwavering dedication to tackling this public health crisis and to developing actionable strategies to eliminate preventable cancer disparities. This document reflects a collective commitment to reducing inequities and advancing health equity for all Ohioans. The panel members, along with their organizational affiliations, are listed in Section XI of this white paper.

We acknowledge their passion and contributions as invaluable steps toward achieving the goal of health equity in cancer outcomes and ensuring a brighter, healthier future for Ohio's diverse communities.

II. EXECUTIVE SUMMARY

Background and Medical Expert Panel Overview

Since 1987, the Ohio Commission on Minority Health (OCMH) has led efforts to confront health disparities and dismantle systemic health inequities across the state. The persistence of health inequities, compounded by the impact of social determinants of health, necessitates both new strategies and an urgent focus on equity. In recognition of these challenges, the OCMH launched the Medical Expert Panel Series in 2014, advancing collaborative, research-informed strategies aimed at achieving health equity. Each panel is composed of experts with diverse experience in healthcare policy, research, public health interventions, and clinical practice, ensuring that recommendations are grounded in evidence and attuned to the unique barriers faced by marginalized communities.

The panel challenged traditional paradigms by addressing the intersection of structural inequities and individual health outcomes. While many well-meaning health improvement strategies fail to yield equitable outcomes, these panels provide recommendations that bridge the gaps left by conventional approaches. The following report focuses specifically on the inequitable burden of cancer within Ohio's racial and ethnic minority communities, underscoring the systemic nature of disparities and the urgent need for structural transformation.

The OCMHMEP-O/PC considered a variety of perspectives and acknowledges that cancer disparities emanate from the intersection of many social issues, which are referred to as social determinants of health. These include, but are not limited to, inadequate access to quality healthcare, poverty, insufficient access to preventative evidence-based interventions, structural racism, inadequate economic opportunity, educational attainment, limited access to clinical trials, prolonged exposure to food insecurity and ineffective policy coordination.

Except for during surges in COVID-19 cases, cancer is the second leading cause of death in the U.S in both men and women nationally, with the majority of cancer related-deaths being due to breast, prostate, lung, and colon cancers. **Overall cancer mortality rates decreased for all racial and ethnic groups, with the largest decrease among Black people, but Black people continued to have the highest cancer mortality rate in 2018.** Racial disparities in cancer incidence and outcomes are well-documented, with research showing that they are driven by a combination of structural, economic, and socioenvironmental inequities that are rooted in racism and discrimination, as well as genetic and hereditary factors that may be influenced by the environment. Despite significant advancements and improvements in cancer outcomes and treatment over time, disparities persist (Kaiser Family Foundation, 2022).
Significant disparities exist in cancer incidence rates by race/ethnicity. Cancer claimed the lives of more than 25,000 Ohioans in 2021, at a rate that was 11% higher than the U.S. rate. Lung and bronchus cancer was the leading cause of cancer death in Ohio and the United States in 2021, followed by colon and rectum cancer, pancreatic cancer, and breast cancer. In 2021, Black people had higher incidence rates than white people in Ohio for the following cancers: cervix, Hodgkin lymphoma, kidney and renal pelvis, larynx, liver and intrahepatic bile duct, lung and bronchus, multiple myeloma, pancreas, prostate, and stomach. In 2021, males in Ohio were more likely to die of cancer than females, and Black people were more likely to die of cancer than white people and Asians/Pacific Islanders.

Moreover, the overall cancer mortality rate for Black people was 12% higher than the rate for white people in Ohio in 2021. Black people had higher mortality rates than white people for 12 out of 23 primary cancers in 2021. Asians/Pacific Islanders had the lowest mortality rate (83.4 per 100,000) for all cancers combined, compared with both white people and Black people, in 2021.

To reverse these trends will require coordinated, upstream, midstream, and downstream strategies to impact the health of our state, reduce health disparities and the associated costs and achieve health equity.

The Ohio Commission on Minority Health's Medical Expert Panel on Preventable Cancers (OCMHMEP-O/PC) purpose is to offer insight and recommendations to address preventable cancers and eliminate cancer disparities in outcomes among racial and ethnic populations in Ohio with the goal of achieving health equity. The OCMHMEP-O/PC seeks to influence the thinking, actions, and policies, which function to transcend the status quo of unacceptable high incidence and prevalence rates of these diseases.

Long-term success will be evidenced by achievement of cancer rates among minorities and other disadvantaged groups that mirror those of the non-minoritized group with the **best** health outcomes for these conditions. Our goal is not that mortality due to cancer be eliminated, but that all Ohio residents, regardless of race, ethnicity or social-economic status have the same chances of survival and optimal health. Our efforts will benefit when we transition from health disparities to a health equity perspective.

Transitioning from Health Disparities to a Health Equity Mindset
The National Institute has prioritized the importance of an intentional shift from centering on the disparities themselves to centering on the root causes of disparities with a health equity focus [Public Health Rep. 2014 Jan-Feb;129 Suppl 2(Suppl 2):71-6. doi: 10.1177/00333549141291S213].

Health disparities are real. The evidence base is large and irrefutable. As such, the time is now to shift the emphasis away from solely documenting the pervasiveness of the **health disparities** problem and begin focusing on **health equity**, the highest level of health possible.

Health equity has many definitions, but the consistent theme is that everyone in society will have a fair and just opportunity to achieve and sustain optimal health (CDC, June 2024).

The National Healthy People 2030 Initiative recognizes that achieving health equity requires valuing everyone equally with focused and ongoing societal efforts to address avoidable inequalities, historical and contemporary injustices, and social determinants of health — and to eliminate disparities in health and health care.

Approaching cancer care from a health equity lens provides an opportunity to tackle root causes that ultimately lead to disparities. This approach also provides the opportunity to take the bold step of articulating a practical vision of what health equity can look like at an institutional level. All too often efforts to improve health outcomes focus on reducing or eliminating disparities as the primary focus. While efforts aimed at eliminating disparities are certainly important, they do not necessarily include strategies to address their root causes, which are often systemic in nature. Through identifying the social determinants of health and implementing interventions accordingly, it is imperative to shift from centering on the disparities themselves to centering on the root causes of disparities, in order to achieve health equity. This will create lasting systemic change (OCCPC).

As the reader reviews the entire document, there are a number of points to consider:

- We must embrace a full understanding of both the burden of preventable cancers as well as the impact in the US and in Ohio. This must examine the full cancer control continuum to include cancer etiology, prevention, early detection, diagnosis, treatment, survivorship, and end of life. In addition, we must focus our attention on cancer trends, complications; and the predisposition for racial and ethnic minorities; as well as the impact of social determinants of health.

- Substantial reductions in the prevalence and the achievement in equitable outcomes for cancer mortality will require a well-coordinated response over a protracted period of time along with resources that last beyond conventional budget cycles or priorities of any one administration.

- It is imperative that new measures be initiated with the goal of improving the quality of care delivered by providers and clinicians who serve a diverse patient population. This approach will help to ensure that our shift to "pay-for-performance" initiatives avoid the unintended consequence of reduced access to populations who have disproportionate rates of chronic disease with poor health outcomes.

- No single institution has the capacity to achieve equity in cancer outcomes and reduce the significant burden of their disease. Moreover, while substantial financial resources are needed, money alone will not solve this problem. In fact, the US spends more money on healthcare, yet still ranks almost at the bottom among the 30 top western industrialized countries for health outcomes. Governmental agencies, community-based organizations, healthcare institutions, faith-based organizations and private industry must provide leadership within their spheres of influence to effect meaningful change. This will require unprecedented collaboration and the integration of new and non-traditional partners to provide leadership within their areas of expertise.

The OCMHMEP-O/PC acknowledges that there are important political considerations surrounding this topic. Recommendations, which solely focus on clinical and programmatic interventions without analyzing the political dimensions of these social determinants of health, are less likely to lead to equitable health outcomes. Overarching efforts to prevent cancer, detect cancers early, develop accessible and effective treatments, eliminate inequities, deliver high quality optimal care, ensure access to clinical trials, diversify the health care and research workforce and maximize the utilization of data must result in the promulgation of policies to achieve equitable access and outcomes for preventable cancers.

Categories and Scope of Interventions

The OCMHMEP-O/PC identified **seven key focus areas** that must be addressed in a comprehensive manner to achieve health equity in preventable cancer outcomes. These include:

1. Assuring access to high quality affordable healthcare.
2. Building and sustaining capacity within communities and institutions to proactively overcome health inequities.
3. Establishing and sustaining access to care coordination, maintain effective protocols to screen high risk populations, provide access to clinical trials, improve individual quality of care through continuing education of healthcare professionals, and linking individuals and families to comprehensive health and community services.
4. Improving meaningful use of data to make informed clinical and policy decisions resulting in improved health outcomes along with improving public availability of provisional or preliminary data along with annual reporting.
5. The development of an intentionally diverse competent workforce to effectively address the multifaceted challenges of cancer.
6. Directly addressing social determinants of health which are primary contributors of inequities and cancer disparities.
7. Empowering patients to make healthy lifestyle choices and practice effective disease self-management.

The Significance of Intervention Levels

These seven identified strategies must be implemented based upon the appropriate scope to achieve health equity. By scope, we mean identifying the level of impact described as “upstream”, “midstream” and “downstream” interventions. Upstream interventions involve policy approaches through laws, rules, and regulations. Midstream interventions are those activities to improve health that occur as the result of an organization’s sphere of influence. Downstream interventions are those practices that influence health status and public health outcomes by direct services. The strategies are not mutually exclusive to a particular scope and indeed function across a wide continuum. The OCHMMEP believes that fully implementing the following recommendations that contain upstream, midstream, and downstream interventions, if implemented over a protracted period, will significantly reduce the cancer burden within racial and ethnic populations in Ohio and make considerable progress toward achieving equity.

Overall, the research data suggest that continued efforts within and beyond the health care system will be important to reduce ongoing racial disparities in cancer, many of which are deeply rooted within the healthcare system. Within the health care system, these may include ongoing efforts to reduce gaps in health insurance, increase access to care, and eliminate discrimination and bias. Beyond the health care system, addressing broader social and economic factors, including exposure to environmental risks and disparities in behavioral risks will also be important. Furthermore, there are ongoing discussions about reevaluating the implications of current cancer screening guidelines for disparities and whether to adjust guidelines or screening approaches to account for higher prevalence and risk for cancers among different communities. Moving forward, increasing diversity among oncology clinical trials and within the health care workforce will also be important for addressing disparities in cancer care and treatment, and ensuring that all people benefit from continued advancements in cancer treatment. (KFF)

Policy change is essential to achieving equitable cancer outcomes. The recommendations within this report extend beyond clinical interventions, emphasizing the importance of addressing the political and social dimensions of health disparities. Transformative change requires unprecedented collaboration among government, healthcare providers, community organizations, and private industry to dismantle systemic barriers. This includes ensuring representation in policy development, expanding access to clinical trials, and investing in community-driven health solutions.

Moreover, sustained change must outlast political cycles and funding priorities. Equity-focused interventions require long-term commitments that align with the lived realities of marginalized populations, ensuring consistent access to care and resources. In this context, financial investment alone will not suffice—strategic leadership, collective action, and accountability are necessary to drive meaningful change.

III. INTRODUCTION/STATEMENT OF THE CANCER HEALTH DISPARITY PROBLEM

Cancer prevention among racial/ethnic minority groups is hindered by significant economic and systemic barriers. These barriers include high medical costs, lack of insurance, geographical isolation, and systemic healthcare inequities. Research suggests that cancer disparities are driven by a combination of inequities within and beyond the health system that are rooted in racism and discrimination. People of color are more likely than their white counterparts to be uninsured and to face other barriers to accessing health care that may limit access to cancer screening, care, and treatment. Beyond health coverage and access to care, discrimination and bias within the health care system and disparities in exposure to risk factors, due largely to underlying social and economic inequities, also drive cancer disparities. While socioeconomic and health care access factors are primary drivers of cancer disparities, research also suggests that hereditary risk and genetic determinants for specific cancer subtypes may explain a portion of disparities. Addressing these issues requires targeted policies to enhance education, access, and equity in cancer care.

In Ohio, 71,925 new invasive cancer cases were diagnosed and reported among males and females in 2021.[1] Over 25,000 cancer deaths among Ohioans occurred in 2021, at a rate that was 11% higher than the U.S. rate (160.1 vs. 144.2 per 100,000).[2] Black individuals had higher incidence rates than white individuals in Ohio for the following cancers in 2021: Cervix, Hodgkin Lymphoma, kidney and renal pelvis, larynx, liver and intrahepatic bile duct, lung and bronchus, multiple myeloma, pancreas, prostate, and stomach cancer (Table 1).[1] In 2021, the overall cancer mortality rate for Black individuals was 12% higher than the rate for white individuals (178.8 vs. 159.7 per 100,000) in Ohio (Table 2). Black individuals had higher mortality rates than white individuals in Ohio for the following cancers in 2021: Breast (female), cervix, colon and rectum, larynx, leukemia, liver and intrahepatic bile duct, lung and bronchus, multiple myeloma, pancreas, prostate, uterus, and stomach cancer.[1] Asian/Pacific Islanders and Hispanics have comparatively lower incidence and mortality rates for the most common cancers compared to other groups.[1] Hispanic individuals had the lowest overall cancer mortality rate (75.1 per 100,000), followed by Asian/Pacific Islander individuals (83.4 per 100,000, Table 2).

Incidence & Mortality Rates by Cancer Site and Race in Ohio, 2021

Overall, incidence rates are similar between Black and white males (508.5 vs. 500.8 per 100,000) for all cancer sites combined, while Black females have a lower cancer incidence rate than white females (397.3 vs. 464.3 per 100,000)[3]. However, cancer mortality rates among Black males is 13.7% higher compared with white males (225.6 vs. 198.4 per 100,000). The cancer mortality rate among Black females is 10.3% higher compared with white females (155.8 vs. 141.3 per 100,000).[3] Rates vary by type of cancer:

Female Breast Cancer:

- Female breast cancer incidence rates were slightly lower among Black females compared with white females (132.5 vs 137.9 per 100,000; Table 1)
- Female breast cancer mortality rates were 41.3% higher among Black females compared with white females (27.0 vs. 19.1 per 100,000; Table 2).

Cervical Cancer:

- Cervical cancer incidence rates were similar among Black and white females (7.9 vs. 7.7 per 100,000; Table 1).
- The cervical cancer mortality rate was 34.8% higher among Black females compared with white females (3.1 vs. 2.3 per 100,000; Table 2).

Colorectal Cancer:

- Colorectal cancer incidence rates were similar among Black and white individuals (36.7 vs. 38.6 per 100,000; Table 1).
- Colorectal cancer mortality rates were 13.1% higher among Black individuals compared with white individuals (15.5 vs. 13.7 per 100,000; Table 2).

Lung Cancer:

- Lung and bronchus cancer incidence rates were 5.5% higher among Black individuals compared with white individuals (63.9 vs. 60.6 per 100,000; Table 1)
- Lung and bronchus cancer mortality rates were also slightly higher among Black individuals (7.5%) compared with white individuals (41.8 vs. 38.9 per 100,000; Table 2)

Multiple Myeloma:

- Multiple myeloma cancer incidence rates among Black individuals were more than double that of white individuals (144%; 12.2 vs. 5.0 per 100,000; Table 1).
- Multiple myeloma cancer mortality rates were 89% higher among Black individuals compared with white individuals (5.3 vs. 2.8 per 100,000; Table 2).

Prostate Cancer:

- Prostate cancer incidence rates were 66.6% higher among Black men compared to white men (184.6 vs. 110.8 per 100,000; Table 1).
- Prostate cancer mortality rates were 81.7% higher among Black men compared to white men (33.8 vs. 18.6 per 100,000; Table 2).

There are two other cancer sites with high disparities in incidence and mortality:

Stomach Cancer:

- Stomach cancer incidence rates were 83% higher among Black individuals compared to white individuals (9.7 vs. 5.3 per 100,000; Table 1).
- Stomach cancer mortality rates among Black individuals were more than double that of white individuals (114.3%; 4.5 vs. 2.1 per 100,000; Table 2).

Liver and Intrahepatic Bile Duct Cancer

- Liver cancer incidence rates were 55.7% higher among Black individuals compared to white individuals (10.9 vs. 7.0 per 100,000; Table 1).
- Liver cancer mortality rates were 63.3% higher among Black individuals compared to white individuals (9.8 vs. 6.0 per 100,000; Table 2).

Table 1. New Invasive Cancer Cases and Incidence Rates by Cancer Site/Type, Race, and Ethnicity, Ohio, 2021

Primary Cancer Site/Type	WHITE		BLACK		A/PI		HISPANIC	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
All Cancer Sites/Types	**62,137**	**466.8**	**7,596**	**459.5**	**732**	**257.2**	**914**	**273.1**
Bladder	2,999	21.5	210	12.9	21	8.7	31	10.7
Brain and Other CNS	771	6.8	60	3.6	9	3.0	20	4.1
Breast (Female)	9,188	137.9	1,167	132.5	173	109.6	139	78.6
Cervix	392	7.7	65	7.9	6	3.6	12	6.5
Colon and Rectum	4,964	38.6	585	36.7	57	20.4	80	24.8
Esophagus	787	5.7	61	3.6	10	3.6	12	3.9
Hodgkin Lymphoma	273	2.6	49	3.1	1	*	6	1.0
Kidney and Renal Pelvis	2,444	18.8	324	20.4	25	8.5	54	15.0
Larynx	504	3.6	71	4.3	4	*	12	3.3
Leukemia	1,557	12.4	152	9.6	13	4.3	28	7.2
Liver and Intrahepatic Bile Duct	1,008	7.0	199	10.9	18	6.4	32	10.6
Lung and Bronchus	8,686	60.6	1,063	63.9	78	30.5	73	25.6
Melanoma of the Skin	3,703	29.2	17	1.0	4	*	19	6.6
Multiple Myeloma	699	5.0	197	12.2	7	2.7	16	5.5
Non-Hodgkin Lymphoma	2,454	18.7	236	14.5	40	14.0	42	13.6
Oral Cavity and Pharynx	1,784	13.1	171	10.2	28	9.7	20	6.0
Ovary	688	10.6	72	8.2	10	6.9	11	6.5
Pancreas	1,812	13.0	253	15.6	19	7.4	19	5.6
Prostate	7,708	110.8	1,436	184.6	53	44.4	109	74.3
Stomach	709	5.3	155	9.7	19	6.8	18	5.3
Testis	284	6.4	13	1.7	4	*	10	3.4
Thyroid	1,577	14.7	176	11.2	37	10.5	48	11.0
Uterus	2,142	31.1	273	28.2	37	22.2	38	22.8
Other Sites/Types	5,004	**	591	**	59	**	65	**

Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024.
Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population. Rates are sex-specific for cancers of the breast, cervix, ovary, prostate, testis, and uterus. * Rates may be unstable and are not presented when the count is less than five. ** Rates are not calculated due to multiple cancer sites/types in this category. CNS = Central Nervous System; A/PI = Asian/Pacific Islander.

Table 2. Cancer Deaths and Mortality Rates by Cancer Site/Type, Race, and Ethnicity, Ohio, 2021

Primary Cancer Site/Type	WHITE		BLACK		A/PI		HISPANIC	
	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
All Cancer Sites/Types	**22,024**	**159.7**	**2,822**	**178.8**	**202**	**83.4**	**217**	**75.1**
Bladder	662	4.8	55	3.7	*	*	*	*
Brain and Other CNS	609	4.7	38	2.4	*	*	*	*
Breast (Female)	1,383	19.1	237	27.0	19	14.2	20	12.3
Cervix	129	2.3	26	3.1	*	*	*	*
Colon and Rectum	1,856	13.7	241	15.5	16	6.3	17	6.3
Esophagus	709	5.1	58	3.5	*	*	*	*
Hodgkin Lymphoma	24	0.2	*	*	*	*	*	*
Kidney and Renal Pelvis	548	3.9	49	3.3	*	*	*	*
Larynx	165	1.2	29	1.7	*	*	*	*
Leukemia	832	6.1	96	6.2	*	*	*	*
Liver and Intrahepatic Bile Duct	846	6.0	169	9.8	18	6.6	23	8.6
Lung and Bronchus	5,527	38.9	676	41.8	45	19.3	39	14.1
Melanoma of the Skin	380	2.9	*	*	*	*	*	*
Multiple Myeloma	392	2.8	80	5.3	*	*	*	*
Non-Hodgkin Lymphoma	764	5.7	66	4.3	11	4.9	13	4.5
Oral Cavity and Pharynx	436	3.1	38	2.3	*	*	*	*
Ovary	478	6.3	41	4.4	*	*	*	*
Pancreas	1,625	11.4	214	13.7	17	7.9	11	4.3
Prostate	1,049	18.6	191	33.8	*	*	*	*
Stomach	273	2.1	71	4.5	10	3.5	10	3.1
Testis	21	0.4	*	*	*	*	*	*
Thyroid	82	0.6	*	*	*	*	*	*
Uterus	373	4.9	88	9.1	*	*	*	*

Source: Mortality - All Cause of Death, Aggregated With State, Total U.S. (1990-2022) <Katrina/Rita Population Adjustment> (SEER*Stat Database), National Cancer Institute, April 2024. Underlying mortality data provided by the National Center for Health Statistics (www.cdc.gov/nchs).
Rates are per 100,000 population and age-adjusted to the 2000 U.S. standard population. Rates are sex-specific for cancers of the breast, cervix, ovary, prostate, testis, and uterus. * Rates may be unstable and are not presented when the count is less than 10. CNS = Central Nervous System; A/PI = Asian/Pacific Islander.

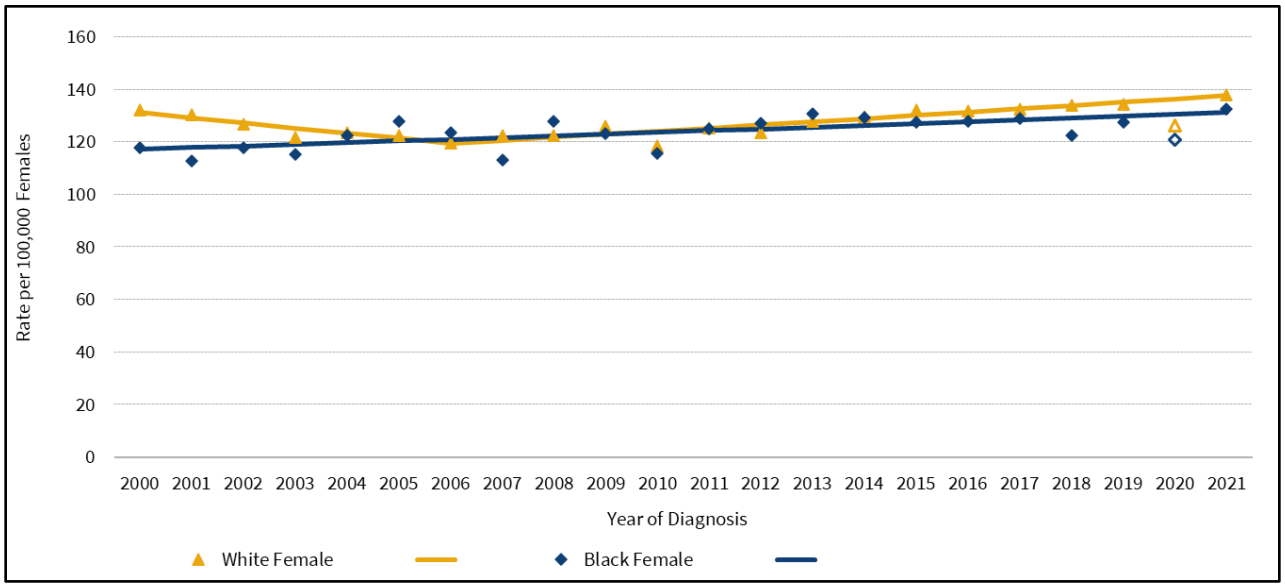
Trends in Cancer Incidence and Mortality in Ohio[3]

While progress has been made in reducing cancer incidence and mortality from 2000 to 2021, disparities by race and gender persist across the six selected cancer types (breast, cervical, colon & rectum, lung, multiple myeloma, and prostate). Generally, mortality rates have declined across most cancer types, though rates remain consistently higher among males, more specifically Black males. Incidence rates were more variable across cancer type, with some cancers showing stable or minor decreases.

Female Breast Cancer:

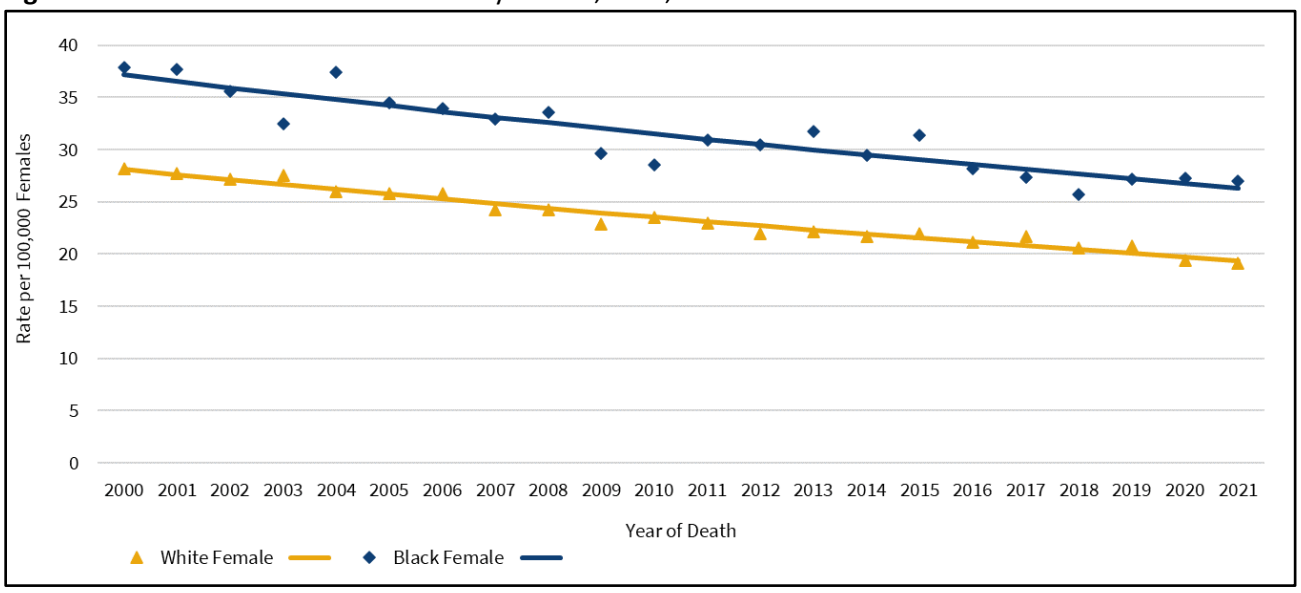
- Female breast cancer incidence rates were fairly stable and followed a similar trend between Black females and white females from 2000 to 2021 (Figure 1a). Mortality rates were consistently higher among Black females, but there was a consistent decline in mortality rates over the 21 year period (Figure 1b).

Figure 1a. Female Breast Cancer Incidence Trends, Ohio, 2000-2021



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024.

Figure 1b. Female Breast Cancer Mortality Trends, Ohio, 2000-2021

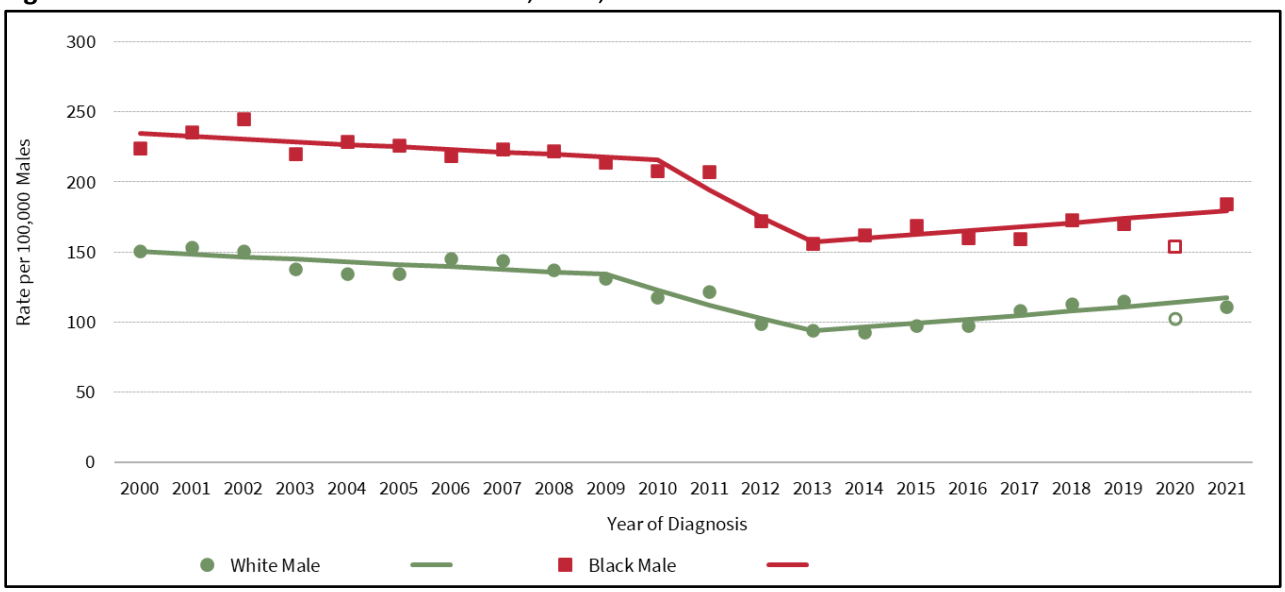


Source: Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Mortality - All COD, Aggregated With State, Total U.S. (1990-2022) <Katrina/Rita Population Adjustment>, National Cancer Institute, April 2024. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

Prostate:

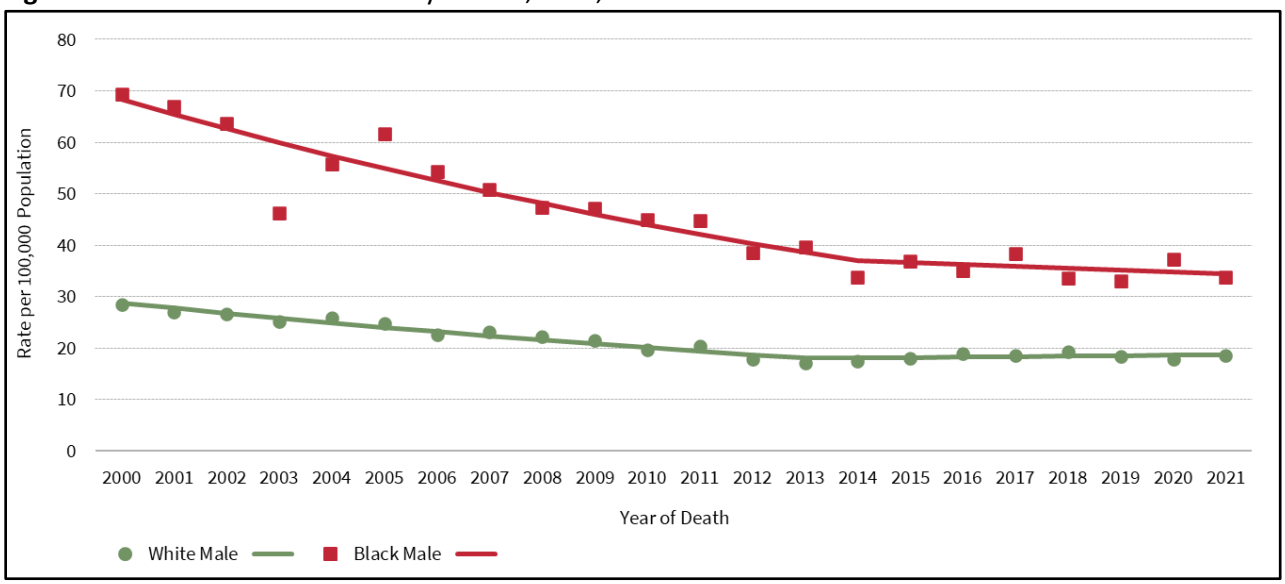
- Prostate cancer incidence rates have declined slightly after 2008 when a change in screening recommendations occurred, but incidence rates have now slightly increased from 2013 to 2021. Black males consistently have higher incidence rates than white males (Figure 2a). While overall mortality rates have declined, Black males continue to experience higher mortality rates compared to white males (Figure 2b).

Figure 2a. Prostate Cancer Incidence Trends, Ohio, 2000-2021



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024.

Figure 2b. Prostate Cancer Mortality Trends, Ohio, 2000-2021

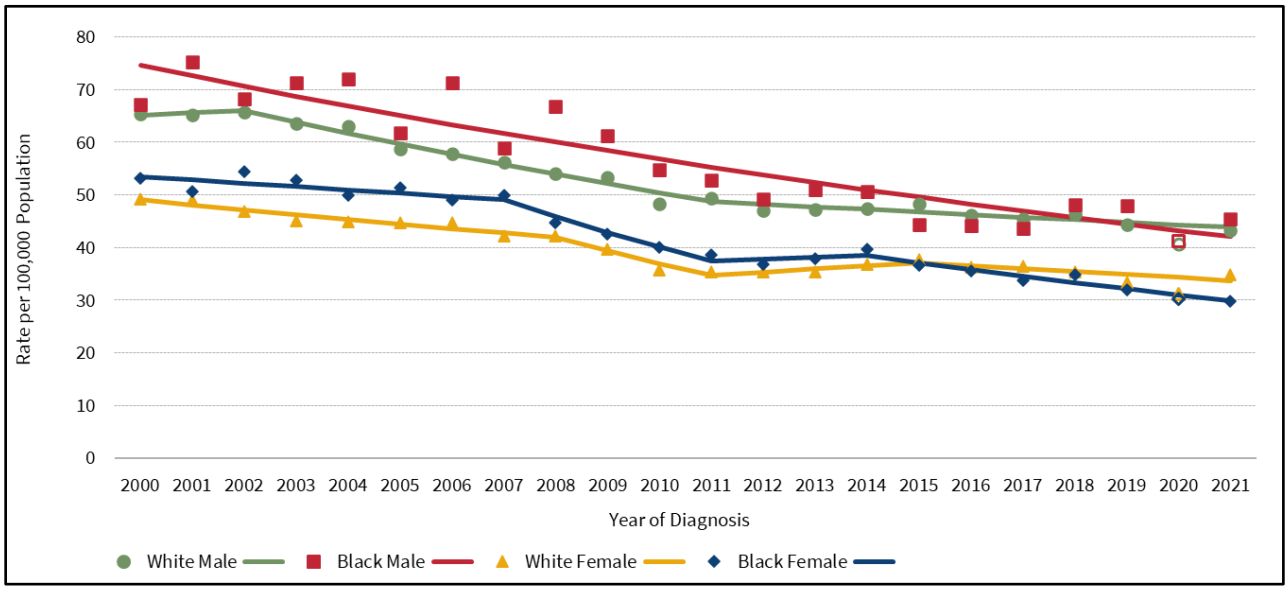


Source: Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Mortality - All COD, Aggregated With State, Total U.S. (1990-2022) <Katrina/Rita Population Adjustment>, National Cancer Institute, April 2024. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

Colon & Rectum Cancer:

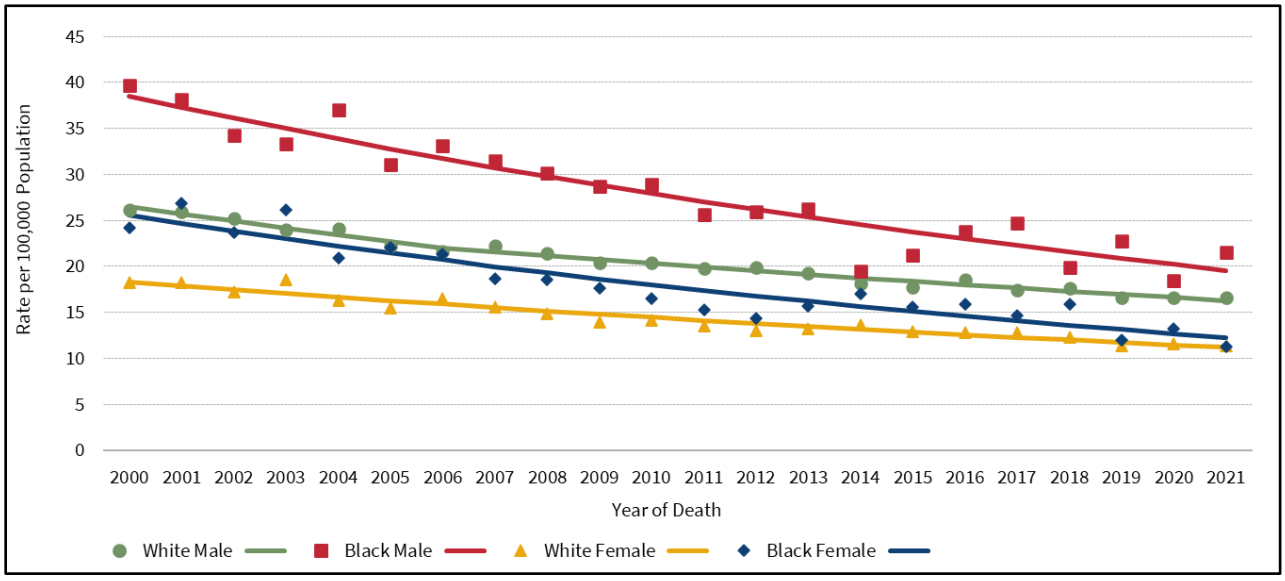
- Colorectal cancer incidence rates have declined overall, with men experiencing higher rates than women and very little differences were observed between Black and white race by 2021 (Figure 3a). The overall mortality rate decreased over the 21-year period (Figure 3b). However, Black men still had higher mortality rates from colorectal cancer compared to white men in 2021. Women had lower mortality rates than men, with similar rates by race.

Figure 3a. Colon and Rectum Incidence Trends, Ohio, 2000-2021



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024.

Figure 3b. Colon and Rectum Cancer Mortality Trends, Ohio, 2000-2021

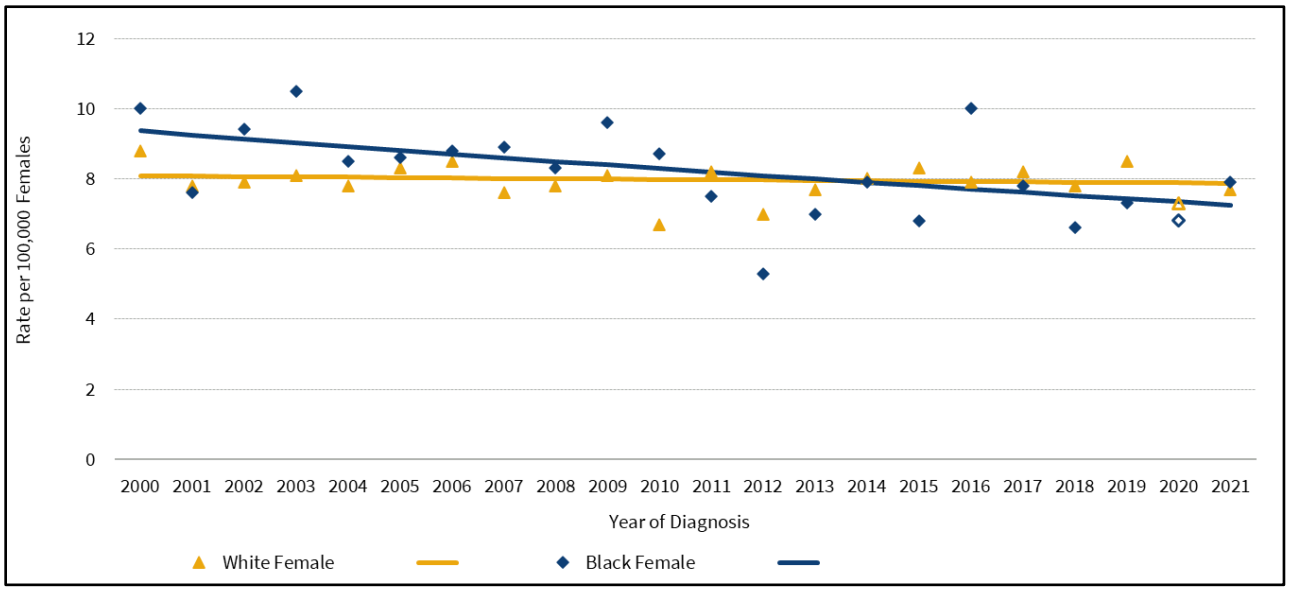


Source: Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Mortality - All COD, Aggregated With State, Total U.S. (1990-2022) <Katrina/Rita Population Adjustment>, National Cancer Institute, April 2024. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

Cervical Cancer:

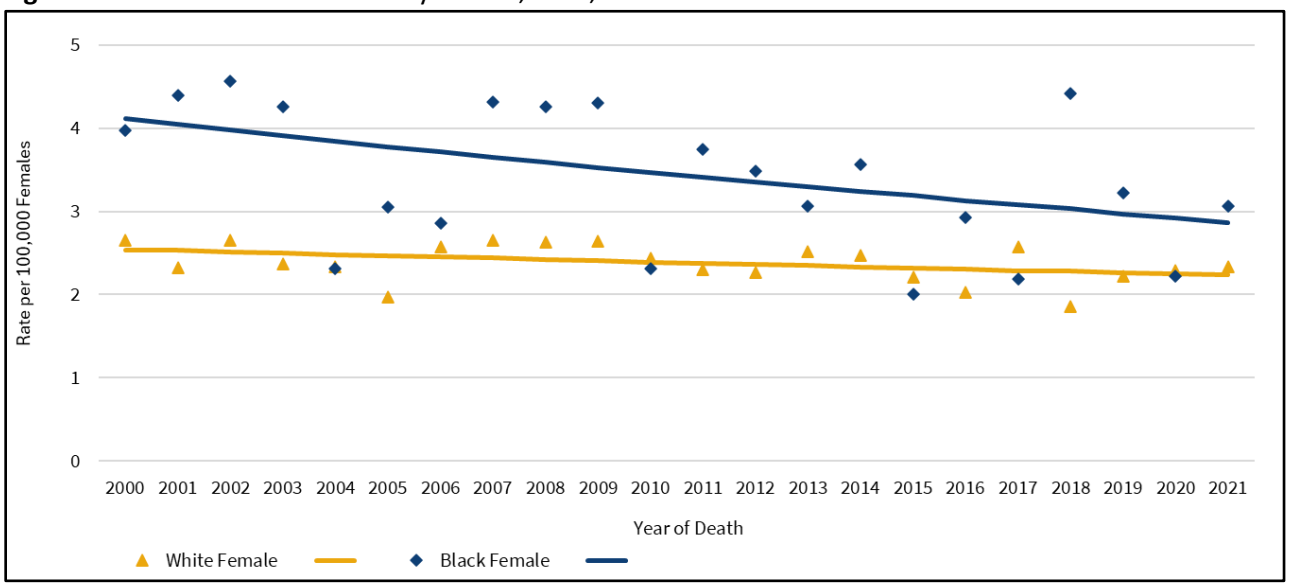
- There was little difference in cervical cancer incidence rates between Black and white females by 2021 (Figure 4a). Mortality rates remained stable for white females, but declined over time for Black females, yet Black females showed consistently higher mortality rates compared to white females (Figure 4b).

Figure 4a. Cervical Cancer Incidence Trends, Ohio, 2000-2021



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024.

Figure 4b. Cervical Cancer Mortality Trends, Ohio, 2000-2021

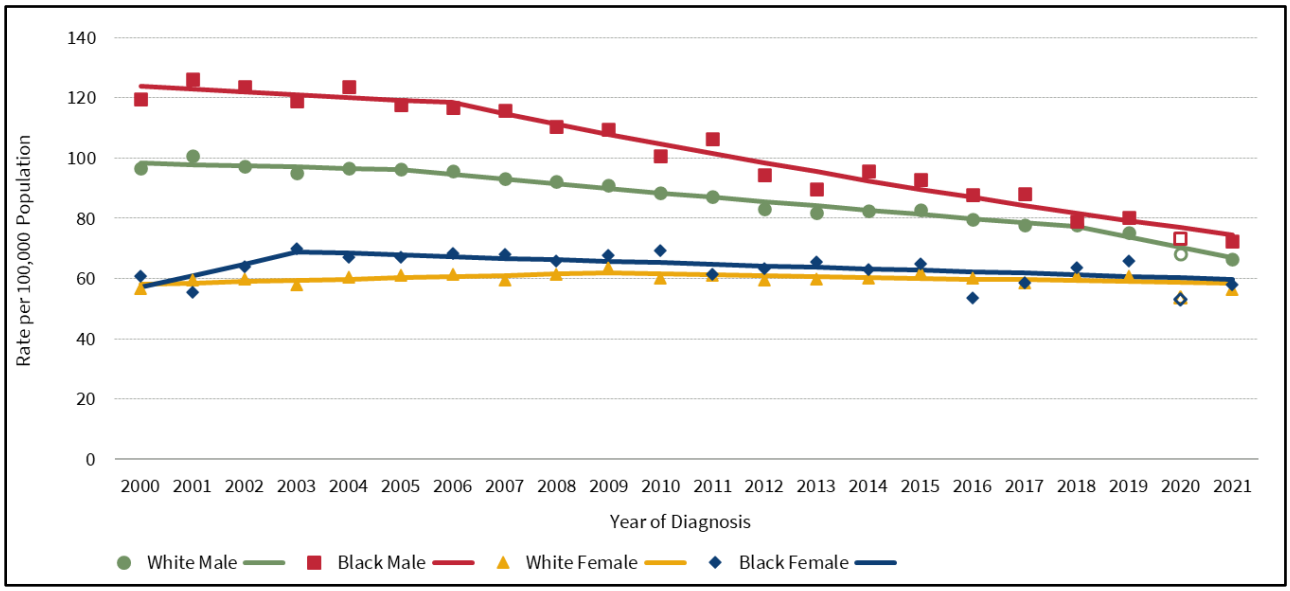


Source: Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Mortality - All COD, Aggregated With State, Total U.S. (1990-2022) <Katrina/Rita Population Adjustment>, National Cancer Institute, April 2024. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

Lung and Bronchus Cancer:

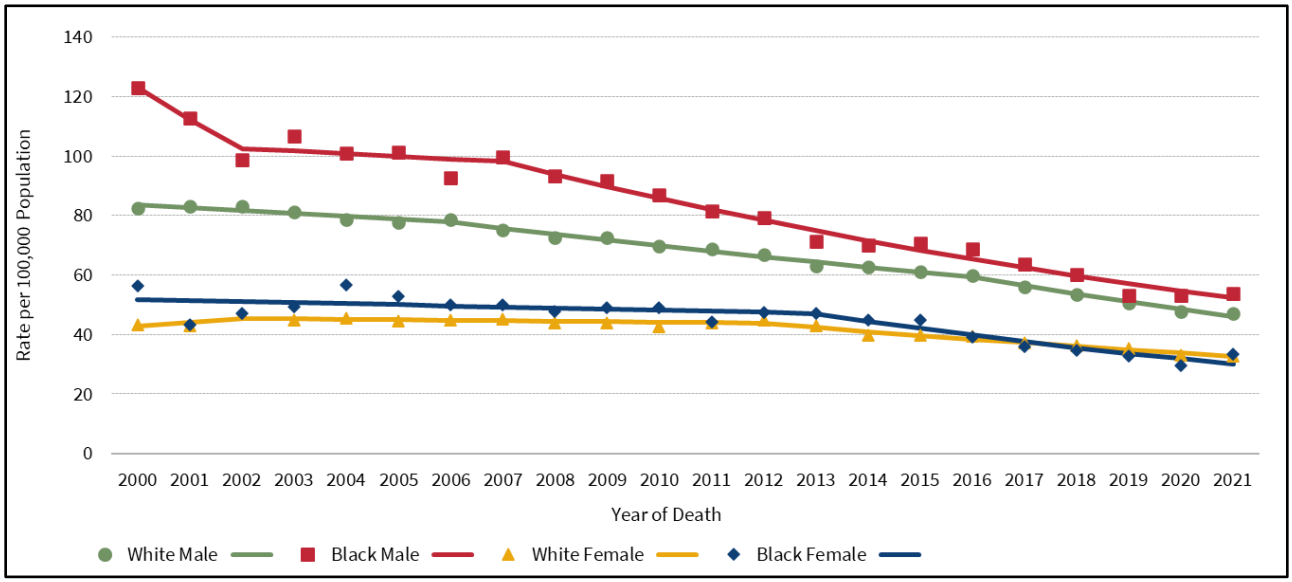
- There has been a large reduction in lung cancer incidence rates among men, while rates among women remained stable from 2000 to 2021 (Figure 5a). Black males consistently had higher incidence rates than white males, although the gap has narrowed in recent years. Despite mortality rates declining in all populations, disparities persist with Black males still experiencing slightly higher mortality rates compared to white males (Figure 5b). No racial difference was seen among women.

Figure 5a. Lung and Bronchus Cancer Incidence Trends, Ohio, 2000-2021



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024.

Figure 5b. Lung and Bronchus Cancer Mortality Trends, Ohio, 2000-2021

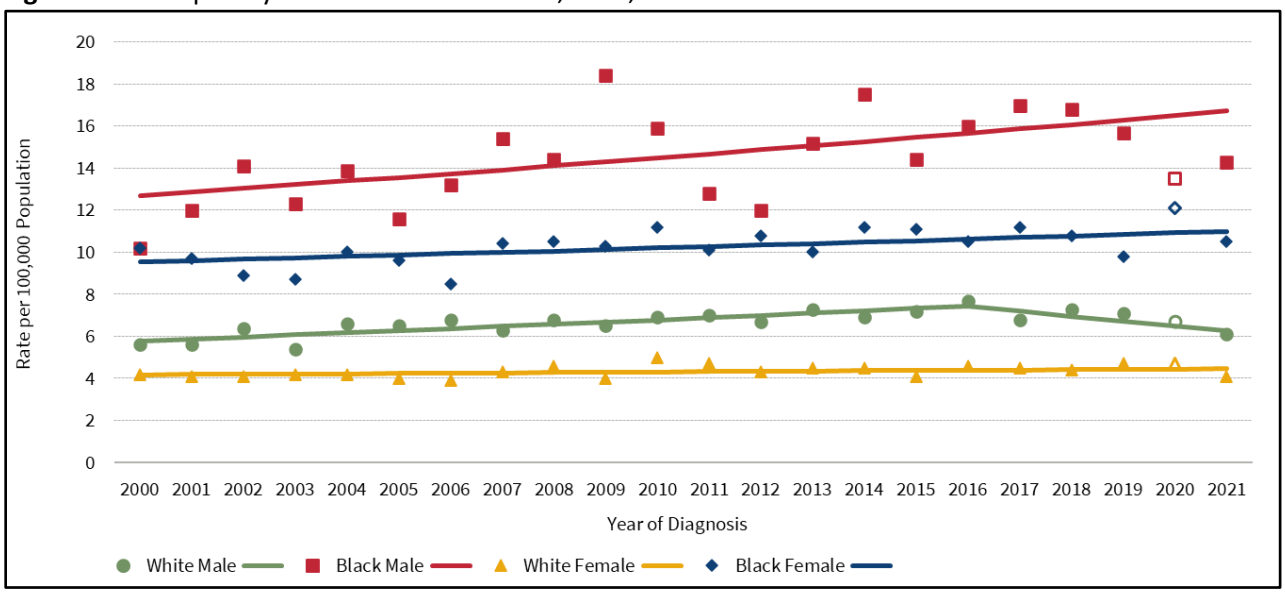


Source: Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Mortality - All COD, Aggregated With State, Total U.S. (1990-2022) <Katrina/Rita Population Adjustment>, National Cancer Institute, April 2024. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

Multiple Myeloma:

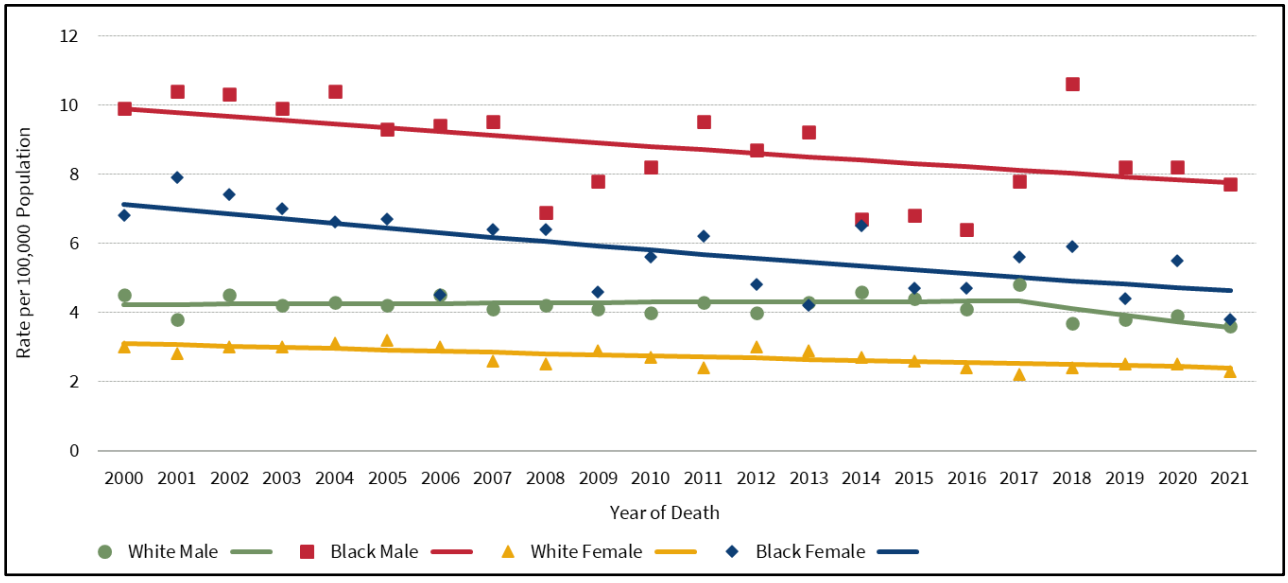
- Generally, multiple myeloma incidence rates were stable over time except for a gradual increase among Black males (Figure 6a). Both Black males and females face higher incidence rates compared to their white counterparts. Although mortality rates have slightly declined for Black males and females, they continue to have higher rates compared to white males and females (Figure 6b).

Figure 6a. Multiple Myeloma Incidence Trends, Ohio, 2000-2021



Source: Ohio Cancer Incidence Surveillance System, Ohio Department of Health, 2024.

Figure 6b. Multiple Myeloma Mortality Trends, Ohio, 2000-2021



Source: Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Mortality - All COD, Aggregated With State, Total U.S. (1990-2022) <Katrina/Rita Population Adjustment>, National Cancer Institute, April 2024. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

Burden and Economic Cost

Addressing disparities in health overall and specific to cancer is not only a moral imperative, it is also crucial to Ohio's economic vitality. An analysis by the Health Policy Institute of Ohio (HPIO) found that if Ohio eliminated racial disparities in income, health and incarceration, Ohio could gain $79 billion in economic output each year. Additionally, Ohio could gain billions in income, consumer spending, tax revenues and healthcare spending savings.[4] As Ohio's demographics continue to become more racially diverse, the benefits of eliminating racial disparities will become even more significant. While this study was not specific to cancer disparities, research shows that cancer has detrimental economic impacts including limiting the ability of people to maintain employment[5] and increased medical debt.[6] Allowing disparities to continue to exist will result in a more economically unstable and unhealthy state. Eliminating disparities will require a comprehensive approach, prioritizing equity across the full spectrum of care including prevention through upstream interventions, screening, research, and treatment.

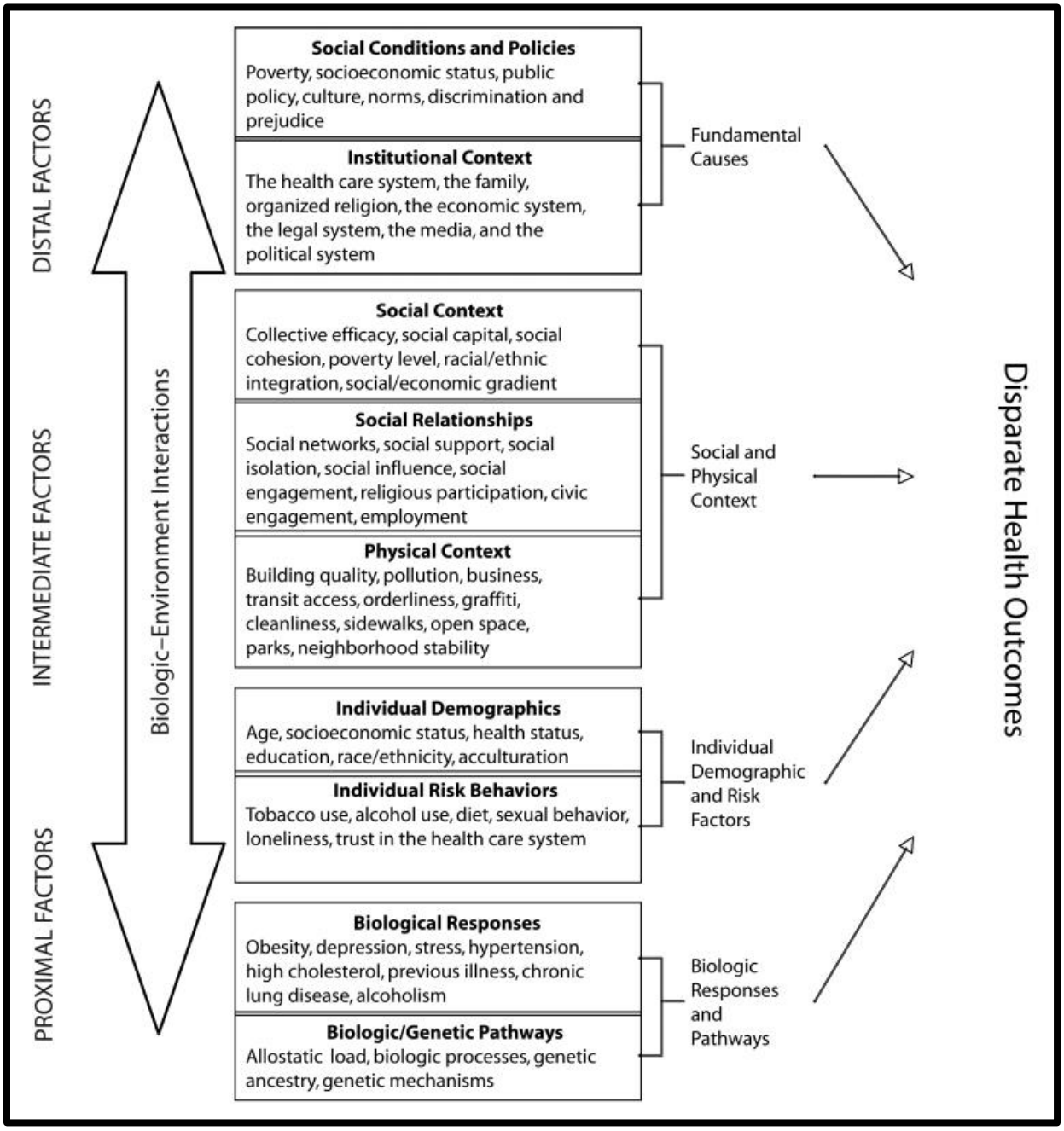
Theoretical Frameworks

Theoretical Frameworks are important to consider when approaching any problem, especially one as complicated as cancer and health disparities. Frameworks allow one to better understand the problem at hand and discover both causes and how to intervene to address the causes, thus contributing to elimination of the problem. There are many models that have been developed to address health disparities and we review a few in this section.

Socioecological Framework – Warneke Model

The Warnecke Model[7] (see Figure 7) is a socioecological model for understanding the multi-level contributors to disparate health outcomes and recognizes the importance of environmental, policy, social, and psychological influences on health.[8] The model was designed to approach the question "how does the unhealthy environment get under the skin?" and explain how population risk relates to individual risk. There are three primary types of determinants (distal, intermediate, and individual determinants). Distal determinants include social conditions and policies (e.g. poverty, discrimination) and the institutional context (e.g. health care system, political system). They are considered fundamental causes of disparate health outcomes because their influence is reflected mainly at the population level. Intermediate determinants include the social context (e.g. social cohesion, racial/ethnic integration), social relationships (e.g. social support, employment), and physical context (e.g. neighborhood stability, pollution). These are the social and physical contexts where the distal effects are experienced. It is hypothesized that these intermediate determinants are what links the environmental effects to the individual factors. Proximal determinants include the individual demographics (e.g. age, socioeconomic status) and individual risk behaviors (e.g. tobacco use, alcohol use). Proximal determinants can also include the biological responses (e.g. obesity, depression, chronic illness) that are affected by the behavior or intermediate determinants.[7]

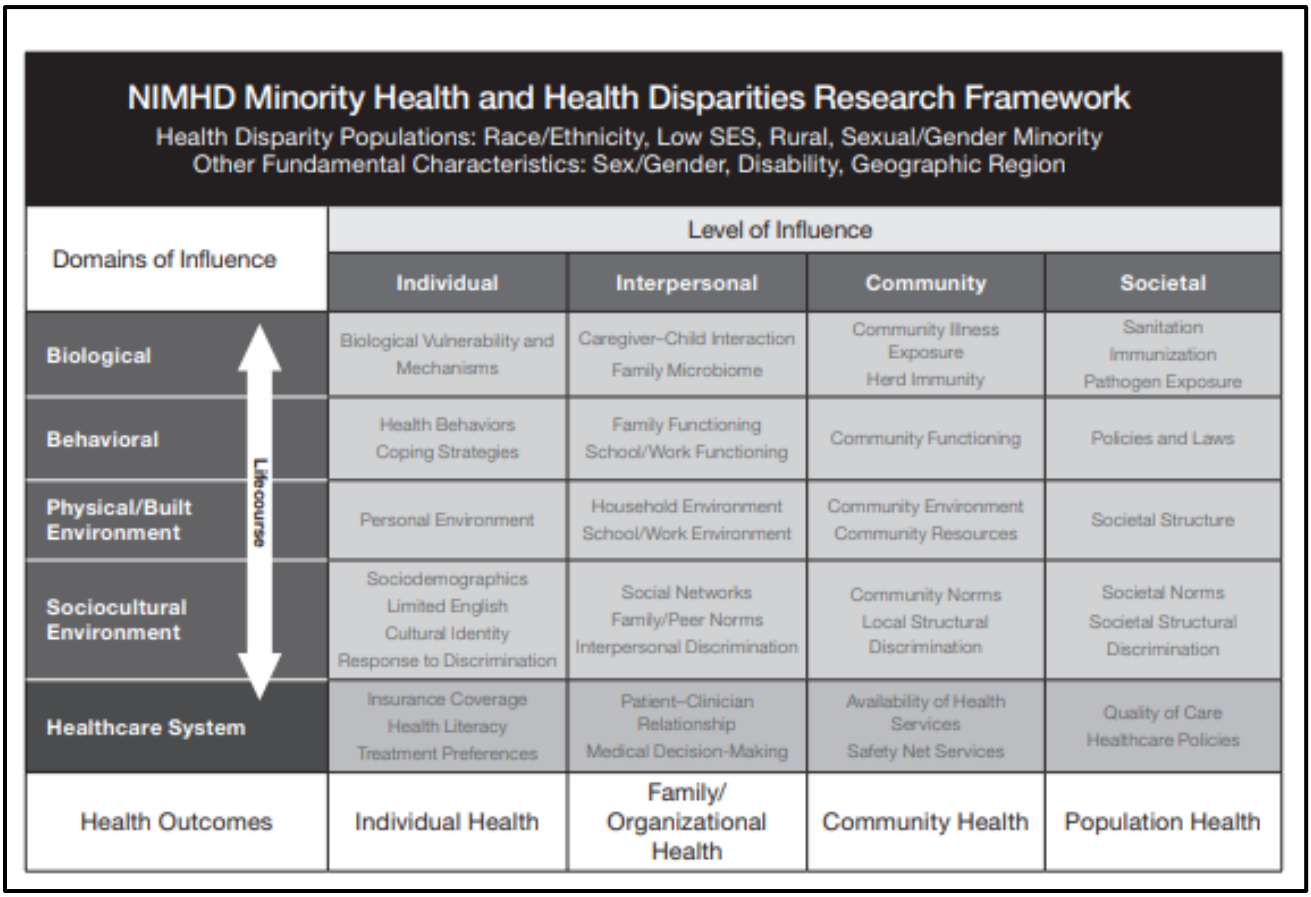
Figure 7. Model for analysis of population health and health disparities (Warnecke, 2008).



Social Determinants of Health Frameworks

The NIHMD Minority Health and Health Disparities Research Framework conceptualizes factors relevant to minority health and health disparities (see Figure 8).[9] There are different domains (e.g. biological, behavioral, physical/built environment, sociocultural environment, and healthcare) and different levels of influence to be considered (individual, interpersonal, community, and societal). This framework can be used as a tool to identify gaps in health disparities research portfolios and assess progress in these differing areas.

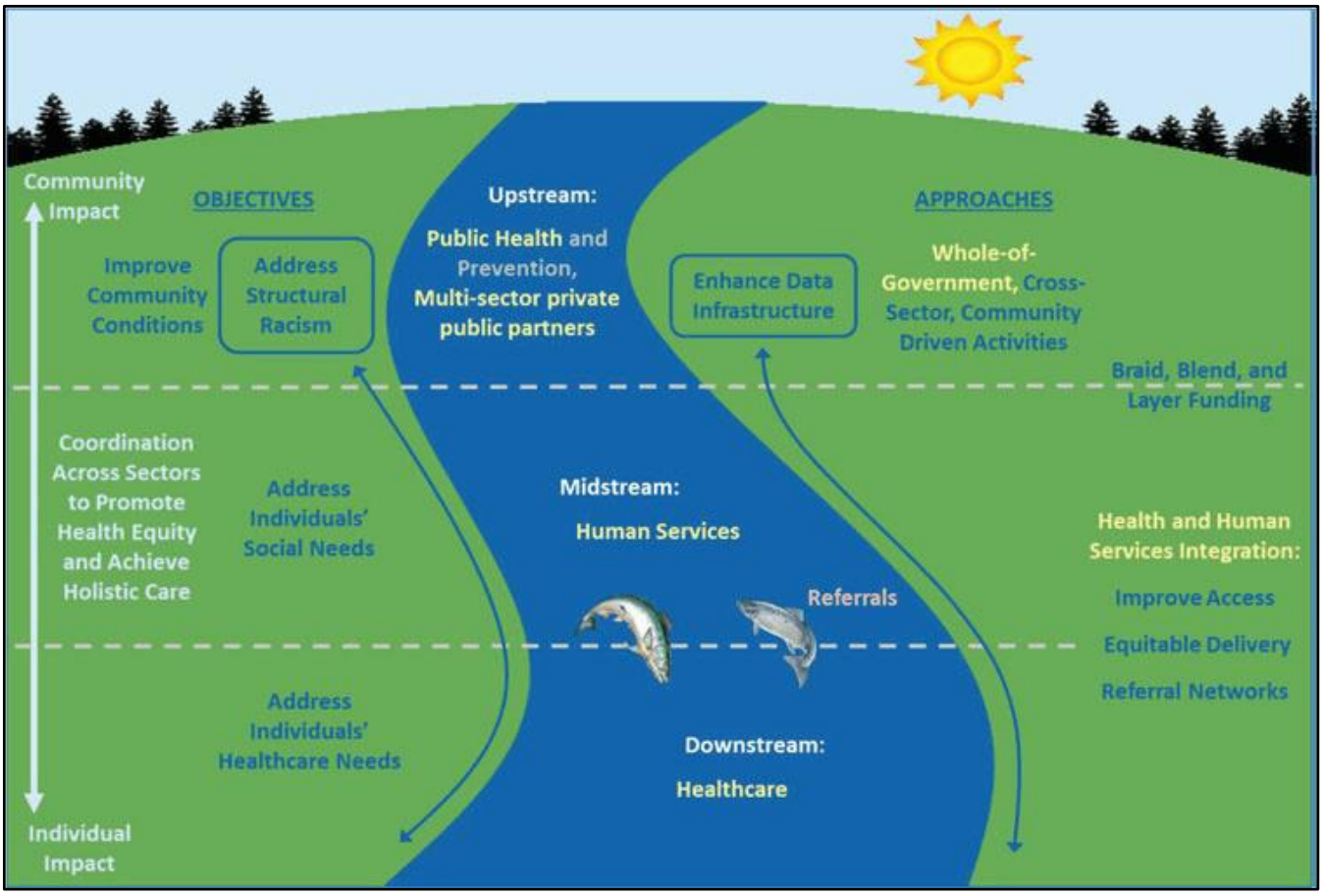
Figure 8. NIHMD Minority Health and Health Disparities Research Framework



The Social Determinants of Health Ecosystem

The Centers for Disease Control and Prevention has developed a framework to explain social determinants of health as part of an ecosystem (see Figure 9).[10] While much emphasis has been put on the downstream consequences (e.g. individual impact) of harmful social conditions, there needs is also a focus on the upstream conditions (community impact) to work towards reducing preventable illness, injury, and death

Figure 9. Social Determinants of Health Ecosystem

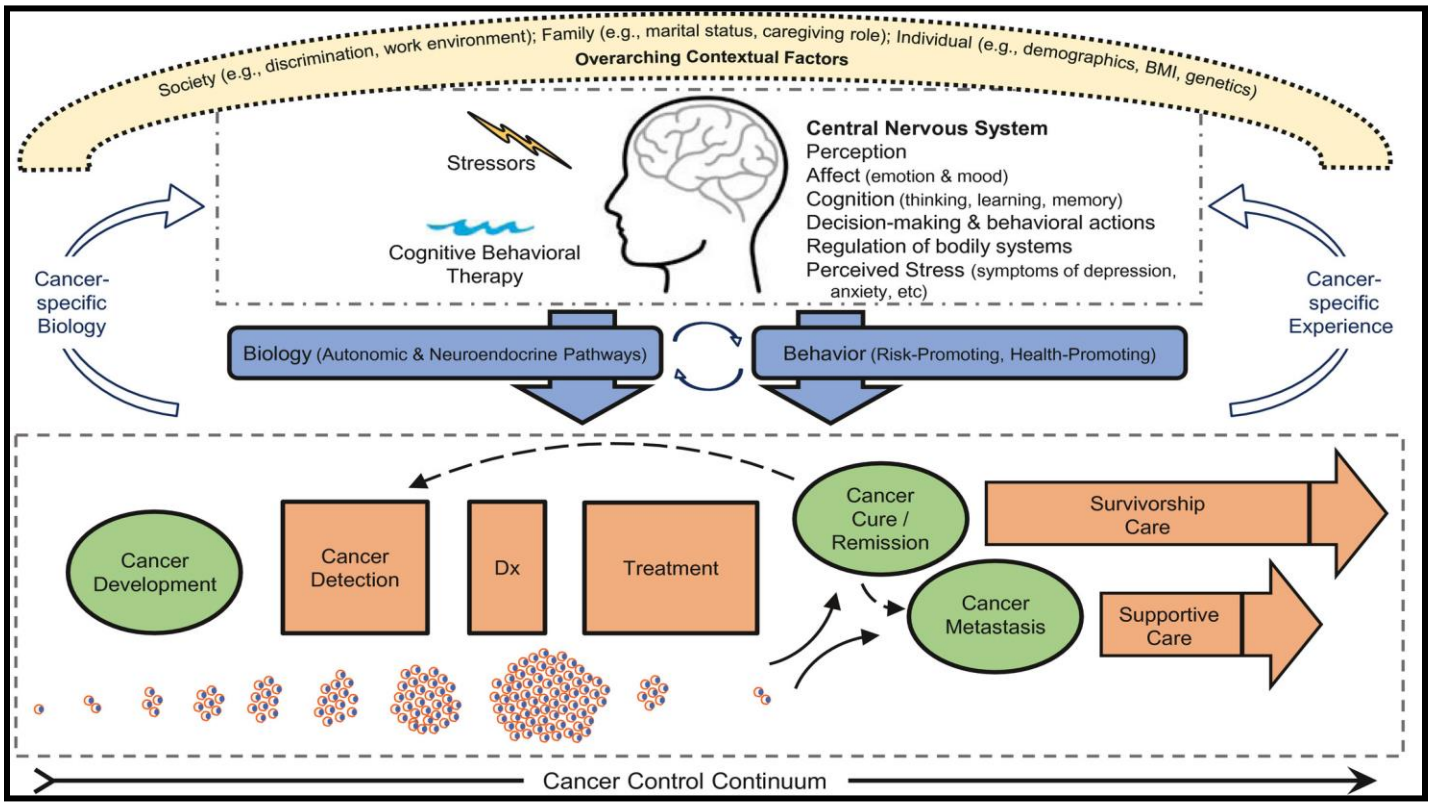


Stress Frameworks and Models

The Biobehavioral Cancer Control Model[11]

While most research articles in oncology focus on the tumor itself and the molecular beginnings and progressions, it is also important to focus research on the person in whom the cancer develops (Figure 10). A person's lived experience is important for quality of life and risk of developing cancer or risk of premature mortality following the cancer diagnosis. The impact of the lived experience on cancer outcomes are mediated by the activities of the central nervous system. This theoretical model diagrams the relationship.[11]

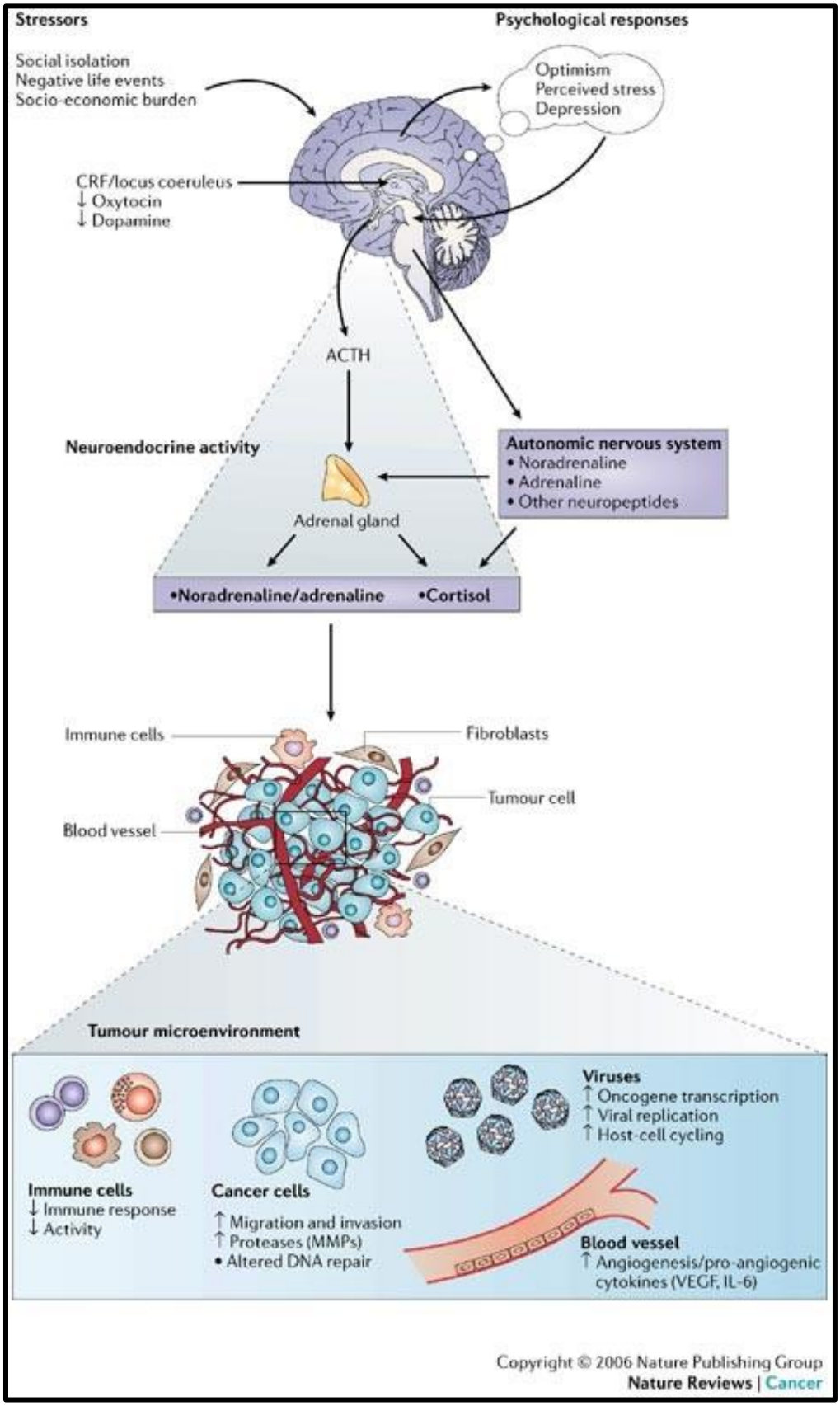
Figure 10. Biobehavioral Cancer Control Model (Bovbjerg et al. 2022)



Effects of stress-associated factors on the tumor microenvironment[12]

There are many interactions between tumor microenvironment, viral oncogenesis and the immune system, reflecting the complexity of cancer pathogenesis (Figure 11). Stressors, such as social isolation, negative life events, or socio-economic burden, affect the central nervous system and subsequently involve the autonomic nervous system and the hypothalamic-pituitary-adrenal (HPA) axis. Stress hormones are released and can alter the activity of multiple components of the tumor microenvironment. When taken together, the downstream effects of stress can create a positive environment for tumor initiation, growth and progression.

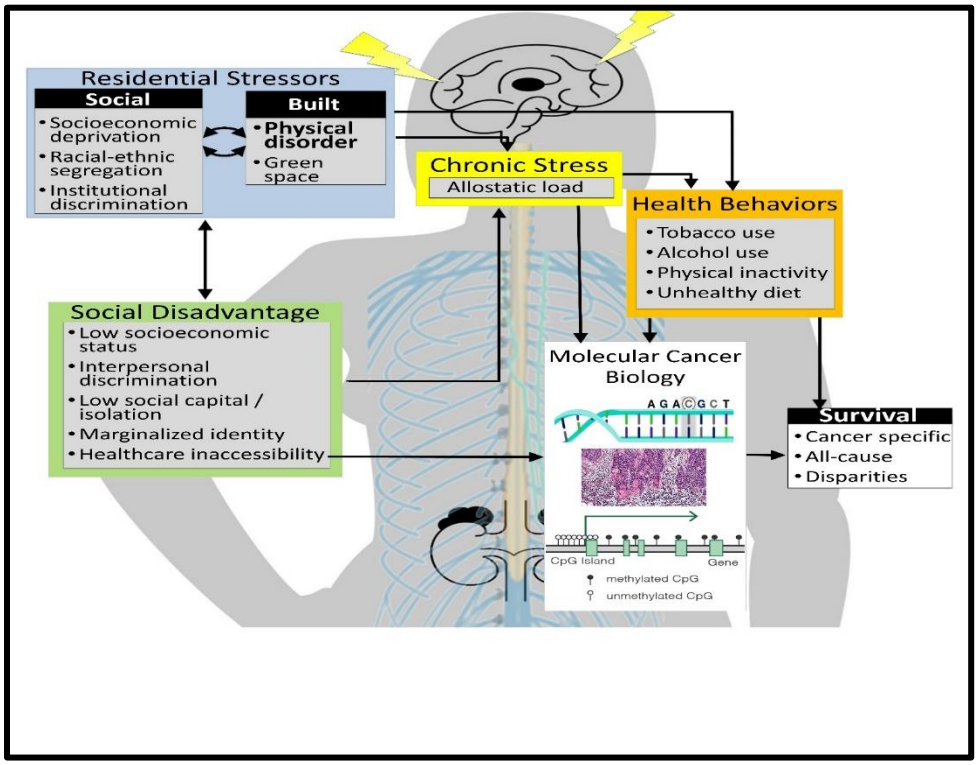
Figure 11. Effects of stress-associated factors on the tumor microenvironment (Antoni et al, 2006)



Chronic stress and neighborhood environments in relationship to cancer biology and survival

Cancer morbidity and mortality varies substantially by social and built-environment factors within the United States (see Figure 12).[13] Residential stressors and physical disorder within a built environment may be associated with cancer outcomes through multiple pathways, including health behaviors (e.g. tobacco use, physical inactivity), chronic stress (e.g. allostatic load), and social disadvantage (e.g. low socioeconomic status, healthcare inaccessibility). All of these can influence DNA methylation and impact cancer-specific survival, all-cause survival, and disparities in cancer survival.

Figure 12. Chronic stress and neighborhood environments in relationship to cancer biology and survival (Dr. Jesse Plascak, 2022)



IV. INTRODUCTION TO THE CANCER CONTINUUM

The cancer continuum emcompasses seven unique stages: etiology, prevention, detection and screening, diagnosis, treatment, survivorship and end-of-life care[14]. While each stage is distinct, they are interconnected and can be integrated across multiple areas.[15] The complexity of the cancer contiuum requires a multi-level approach to improve both the overall quality of care and patient health outcomes.

Despite medical advances in cancer prevention, early detection, treatment, significant racial, ethinic, and socieoeconomic disparities persist throughout the cancer continuum.[16,17] Disparities along the cancer continuum are primarily driven by the complex interplay between the social determinants of health, behavior, biology, and genetics.[18] Each transition in the continuum offers opportunities to address disparities in cancer outcomes and are crucial for creating an equitable cancer-free state.

V. CANCER CONTINUUM

ETIOLOGY

The etiology of cancer is complex and involves the interaction of genetic, environmental, demographic, and lifestyle factors. Additionally, exposures to certain infectious diseases and medications also play a role in cancer development.

Differences in genetic, tumor biology, and immune environment contribute to disparities in cancer etiology among racial and ethnic minorities.[18] Exposure to environmental carcinogens such as industrial pollutants and poor air quality, are also disproportionately reported among communities of color and low-income populations.[19]

Disparities in lifestyle choices are evident throughout the cancer continuum. Disparities in diet, nutrition, and physical activity are typically driven by low socioeconomic status, where individuals in these communities have limited access to fresh produce and healthy food options. The lack of access to healthy food options can lead to dietary patterns high in processed foods and saturated fats, which can contribute to higher rates of obesity, diabetes, and cardiovascular disease.[20] Individuals living in low socioeconomic communities are less likely to have access to physical activity facilities, sidewalks, connected streets, bike trails, and perceived safe outdoor spaces compared to high-income communities.[21,22] The lack of opportunities for healthy diets and physical activity contribute to obesity, a leading factor in cancer etiology.

Specific Cancers

Breast Cancer

Genetic risk factors for breast cancer include mutations to the BRCA1/BRCA2 tumor suppressor genes, previous biopsies showing hyperplasia, lobular carcinoma in situ, and a family history of breast cancer.[23] Additionally, treatment-related exposures to radiation for women with a history of Hodgkin's or non-Hodgkin lymphoma also increase risk for breast cancer, especially if initiated at earlier ages.[24] Lifestyle choices and conditions include alcohol consumption, obesity, not being physically active, not having children, not breast feeding, some birth control methods (oral contraceptives, birth control shots, birth control implants), being a current or previous tobacco smoker, and receiving menopausal hormone therapy.[25] Demographic factors that contribute to an increased risk of breast cancer are being born female, older age (most breast cancers are found in women age 55 and older), having high breast density, early menarche (age less than 12), later age of menopause (typically after 55).[24]

Disparities in breast cancer etiology are seen in differences in genetic, environmental, lifestyle, and socioeconomic factors among various populations. Mutations to BRCA1/BRCA2 are more prevalent in certain ethnic groups such as Non-Hispanic Black women.[23] Non-Hispanic Black women are less likely than white women to undergo genetic counseling to detect BRCA1/2.[26] African Americans account for < 10% of individuals undergoing genetic counseling and testing (GCT) for BRCA1 / 2 or other breast cancer susceptibility genes versus more than 65% for white women. Furthermore, white women are almost five times more likely to undergo GCT as African American women despite African Americans having similar rates of pathogenic variants, when tested (Ademuyiwa, et al. JCO 2021).

Colorectal Cancer (CRC)

Key genetic risk factors for colorectal cancer include inherited genetic mutations associated with Lynch syndrome and familial history of colorectal cancer or adenomatous polyposis.[27,28] Lifestyle factors significantly linked with higher rates of colorectal cancer include diets high in red and processed meats and low in fruits, vegetables, whole grains, physical inactivity, obesity, smoking, and heavy alcohol consumptions.[27,29] Medical conditions, including inflammatory bowel disease and type 2 diabetes, also increase the risk of colorectal cancer due to chronic inflammation and metabolic changes. Prior exposure to radiation therapy for other cancers also contribute to risk.[28]

Disparities in colorectal cancer etiology exist among different racial and ethnic groups, as well as by socioeconomic status. African American and Ashkenazi Jews have higher rates of genetic risk factors compared to other racial and ethnic groups.[27] Economic constraints due to low socioeconomic status provide barriers to accessing healthy balanced diets high in fruits, vegetables, and whole grains, which results in increased risk of colorectal cancer. CRC development has been clearly linked to socioeconomic inequality due to several mechanisms: poorer food quality, higher stress, more tobacco and alcohol, low physical activity, alterations in gut microbiome, increased inflammation, and compromised immunity (Carethers, Adv Cancer Res, 2022). Black and Hispanic patients tend to live in under-resourced areas and face disproportionate exposure to these risk factors

Multiple Myeloma

Multiple myeloma is a type of cancer that arises from plasma cells in the bone marrow. Multiple myeloma is more than twice as common in African Americans than in white Americans. However, the reason for this disparity is not fully understood.[30] Potential risk factors for multiple myeloma include age (≥65 years old), male sex, excess body weight, and family history (sibling or parent) of multiple myeloma. There is also evidence that people with monoclonal gammopathy of undetermined significance (MGUS) or solitary plasmacytoma are at a higher risk of developing multiple myeloma.[31] Both men and non-Hispanic Black people have a higher prevalence of MGUS than women and non-Hispanic white people.[32]

Cervical Cancer

Almost all cervical cancers are caused by infection with the human papillomavirus (HPV). Estimates suggest that 99.7% of cervical cancer diagnoses are related to HPV infection.[33] HPV is a double-stranded DNA virus that integrates into human DNA, leading to prolonged infections and cancer development. The virus initially causes pre-cancerous lesions, known as carcinoma in situ (CIS) or cervical intra-epithelial neoplasia (CIN). These pre-cancerous lesions usually have a relatively extended period before development of invasive carcinoma, which can take on average 10–15 years to develop.[34] Key risk factors associated with HPV infection include early onset of sexual activity, multiple sexual partners, high-risk sexual partners, and a history of sexually transmitted infections.[33-35] Aside from risk factors for HPV exposure, immunosuppression is a significant contributor to the development of cervical cancer. Immunodeficiency from conditions such as acquired immunodeficiency syndrome (AIDS), medical therapy for organ transplants, and autoimmune disorders can contribute to the development of cancer after HPV infection. For these individuals' "clearance" of the HPV virus can be particularly challenging leading to dysplastic changes and eventual cancer. Cigarette smoking is also strongly associated with cervical cancer, potentially increasing the risk of cervical cancer by 50%.[35,36]

Cervical cancer disparities are influenced by various biological and social factors. The majority of cervical cancer cases are classified as squamous cell carcinoma (70%) and adenocarcinoma (20%), both linked to HPV infection.[37] The two most common HPV subtypes are HPV16 and HPV18 which contribute to the largest number of cervical cancer diagnoses (>70%). HPV18 is more commonly associated with adenocarcinomas, while smoking predominately increases the risk of squamous cell carcinoma. Additionally, marginalized groups including racial and ethnic minorities and low socioeconomic populations, often experience higher exposure to HPV and associated risk factors due to limited access to health care, lower rates of HPV vaccination, and socioeconomic challenges. Furthermore, the use of menthol cigarettes, which is more prevalent among African Americans, complicates efforts to quit smoking thus elevating cervical cancer risk.[21,22]

Prostate Cancer

Age is the strongest risk factor for the development of prostate cancer, with men over the age of 65 being the most at-risk. Genetic risk factors include having a first-degree relative with prostate cancer, and other members of your family having been diagnosed with breast, ovarian, or pancreatic cancer.[38,39] Racial disparities exist in prostate cancer development, with African American men have the highest incidence.

Lung Cancer

Smoking is the leading risk factor for lung cancer, followed by exposure to radon gas.[40] The risk for lung cancer increases with the duration and intensity of smoking. 80% of lung cancer deaths are attributable to smoking.[41]

Marginalized groups in the United States bear a disproportionate burden of lung cancer due to various socioeconomic factors.[42-48] African Americans experience the highest lung cancer incidence and mortality rates compared to all other racial and ethnic groups.[49,50] The disparity persists across all socioeconomic statuses, with the risk being greatest among those with low socioeconomic status.[51,52] Despite smoking fewer cigarettes per day and being less likely to smoke daily compared to whites, African Americans have higher lung cancer rates.[53-55] Additionally, African Americans are more likely to smoke menthol cigarettes, which are linked to increased initiation and greater difficulty quitting smoking.[54,55]

Exposure to second-hand smoke and air pollution further exacerbate lung cancer risk among marginalized populations.[56-66] Racial and ethnic minorities and low-income individuals are more likely to work in blue-collar jobs or services jobs without restrictive smoking policies. Additionally, these individuals are also exposed to higher levels of particulate air pollution in their living and working environments than whites.[65]

Family history is also a significant risk factor for lung cancer, especially if there is a history of early-onset lung cancer before the age of 60.[66] Furthermore, African Americans with a first-degree relative who had early-onset lung cancer face a greater risk compared to their white counterparts.[67]

PREVENTION

While cancer cannot completely be prevented, actions can be taken to reduce the risk through lifestyle changes.[68] Lifestyle modifications for cancer prevention include a healthy diet, regular physical activity, avoiding smoking, and limiting alcohol consumption. Chemoprevention is the use of natural or synthetic substances to prevent cancer development. Limiting environmental and/or occupational exposures to known carcinogens, such as asbestos, radon, ultraviolet light, and industrials chemicals, can also prevent various cancers. Higher rates of smoking, obesity, and alcohol consumption contribute to the disparities in cancer prevention. Additionally, lower vaccination rates also contribute to disproportionate rates to certain cancers.[18]

A number of different cancers can be linked to inherited genes, which can be identified through genetic testing long before cancers even develop. Despite the power of genetic testing, disparities in genetic testing are seen by race, ethnicity, socioeconomic status, and geographic location. These disparities can lead to unequal access and utilization across different populations.[69] More specifically, there is a general lack of representation of non-white populations in genetic testing research.[70]

Many of the disparities in cancer prevention are attributed to low socioeconomic status. Low-income individuals and communities have lower rates of prevention uptake, including lifestyle changes, chemoprevention, and vaccinations. Communities with low socioeconomic status have a general lack of accessible health care infrastructure, parks, healthy food options, and higher rates of cigarette and alcohol use.[71,72] Additionally, Ohio ranks 6th nationally in current cigarette use, ranks 14th in the nation in obesity, and has higher rates of excess and binge drinking compared to the national average.[73-75] Racial and ethnic minorities are disproportionately represented and affected by low socioeconomic status compared to white non-Hispanic individuals.[72]

Specific Cancers

Breast Cancer

As a way to help predict a woman's risk for breast cancer, researchers have developed Breast Cancer Risk Assessment Tools (based on the modified Gail model). Based on a multitude of risk factors, most of which have been described in the *etiology* section of the white paper, the risk assessment tools can estimate individual risk of breast cancer in the next 5 years.[76,77] Care providers along with individuals can utilize risk assessment tools to make informed decisions on steps they can take to reduce their risk breast cancer development.

In addition to the risk assessment tool, modifiable risk factors can also prevent breast cancer, including alcohol consumption, obesity, lifestyle choices, and hormonal influences.[78] Alcohol consumption is well-documented as a risk factor for breast cancer, where even moderate drinking can increase an individual's risk.[79]

While estrogen, a female sex hormone, plays a key role in reproductive health, it has also been associated with increased risk of certain cancers.[80,81] The use of combined menopausal hormone therapy (estrogen plus progestin), also known as hormone replacement therapy, can increase a woman's risk of breast cancer.[82,83] Obesity is another strong risk factor for breast cancer, where it has been suggested that excess body fat increases estrogen production and can cause breast cancer development.[84,85]

For chemoprevention, drugs that block estrogen receptors, such as tamoxifen and raloxifene, are effective in women who are at high risk of breast cancer.[77,86] Aromatase inhibitors (anastrozole and exemestane) can also reduce the risk of breast cancer by lowering estrogen levels in women whose ovaries are not producing estrogen (post-menopause). While aromatase inhibitors are not FDA approved to lower breast cancer risk, some expert groups included them as options to reduce breast cancer risk in post-menopausal women.[87]

Disparities exist in the utilization of breast cancer prevention methods. Black women are less likely to be knowledgeable about personal cancer risk or prevention approaches and have lower use of genetic testing or enhanced surveillance routines to mitigate risk.[88]

Colorectal Cancer (CRC)

Regular colorectal cancer screening is essential for colorectal cancer prevention. Abnormal cells that grow into polyps, which have the potential to develop into cancerous cells in 10 to 15 years, can be removed.[89,90] Additionally, genetic testing for Lynch syndrome or familial adenomatous can help inform earlier and more frequent screening for colorectal cancer.[91]

Lifestyle modifications such as regular physical activity, maintaining a healthy weight, non-smoking, diets rich in fruits, vegetables, whole grains, and fiber can help reduce the risk of colorectal cancer.[90] Diets high in red meats (beef, pork, and lamb), processed meats (hot dogs, sausage, and lunch meats) can increase the risk of colorectal cancer.[92]

Non-steroidal anti-inflammatory drugs (NSAIDS), more specifically low-dose aspirin, has also been recommended for certain cardiovascular disease risk profiles as a way to reduce colorectal cancer risk.[93] Research has also found that therapies with specific cyclooxygenase (COX-2) inhibitors might be an effective approach in colorectal cancer prevention.[94]

Disparities in colorectal cancer prevention include a lower referral rate for genetic testing in racially and ethnically diverse patients.[95] Screening for colorectal cancer screening also differs by racial and ethnic minorities, where Hispanics and African Americans are less likely to be screened compared to non-Hispanic whites.[96,97]

Multiple Myeloma

Research on multiple myeloma prevention is sparse and very few cases are linked to non-modifiable risk factors.[98] Despite no guaranteed preventative measures for multiple myeloma, adopting a healthy lifestyle, such as regular physical activity, healthy diet, and non-smoking behavior can reduce the risk. Additionally, because family history or multiple myeloma and MGUS are known risk factors, individuals with these characteristics should regularly monitor and screen for multiple myeloma.

Cervical Cancer

HPV vaccinations serve as a primary prevention strategy for cervical cancer, as HPV causes almost all cases of cervical cancer. Therefore, HPV vaccination can dramatically decrease the risk of cervical cancer development.[99] The current HPV vaccination recommendation is a 9-valent vaccine designed to protect against nine different strains of HPV and to begin at ages 11–12.[100] Vaccination may begin as early as 9 years-old with approval extending to age 45 and can be administered to both boys and girls.

Studies have demonstrated the HPV vaccine effectiveness, with one study showing that the 9-valent vaccine prevented 97% of pre-cancer gynecologic lesions among individuals who did not have HPV.[100] HPV vaccination also provides reduction in rates of other HPV driven cancers like anal and oropharyngeal. HPV vaccine safety is also high, with most post-market adverse events being mild and no new safety signals emerging since its approval.[101]

Finally, because HPV is a sexually transmitted disease, condom use during sexual intercourse may also reduce the risk of infection, but not completely.[99]

Disparities in HPV vaccination exist by socioeconomic status. Individuals with lower educational attainment were significantly less aware of HPV and HPV vaccination, compared to those with higher levels of education.[102] While racial and ethnic minorities were more likely to initiate HPV vaccination than whites, they were less likely to complete the entire vaccine series.[103]

Prostate Cancer

Lifestyle factors that can reduce the risk of prostate cancer are diets high in soy proteins, and diets low in dairy and calcium.[104] Regular physical activity can help in maintaining both a healthy weight and risk of advanced prostate cancer.[104] Individuals with low-socioeconomic status and racial and ethnic minorities has less access to healthy food options and opportunities for regular physical activity. Medicines that have the potential to reduce the risk of prostate cancer include 5-alpha reductase inhibitors, such as finasteride and dutasteride. These inhibitors work to reduce the production of dihydrotestosterone (DHT), a hormone that plays a key role in prostate growth.[104,105] While access to 5-alpha reductase inhibitor up-take by various socioeconomic groups has not been studied extensively, disparities in health care access can affect their utilization.

Lung Cancer

Smoking is a well-established cause of lung cancer.[106] Racial and ethnic minorities and those of low socioeconomic status are more likely to smoke and also experience tobacco-related disease, more specifically lung cancer, compared to non-Hispanic whites.[107] Environmental factors among disparate populations include a lack of residential and workplace smoking restrictions, causing increased exposure to second-hand smoke.[56-64]

To effectively prevent lung cancer, future efforts can focus on smoking prevention and cessation. Prevention can come in the form of increased education on the risks of smoking, endorsement of validated smoking cessation programs, reduction in tobacco use marketing and social influence, workplace enforcement of smoking bans, and addressing the underlying stress and discrimination that drive smoking behaviors.[108-115] Decreasing rates of smoking initiation and increasing rates of smoking cessation are vital steps for lung cancer prevention.[108]

DETECTION & SCREENING

Detection of cancer at early stages results in increased treatment effectiveness and survival.[116] Despite the availability of screening and detection tools, approximately 50% of cancers are identified at advanced stages, greatly reducing survival rates.[116] Screening for some cancers can also prevent the development of a cancer if pre-cancerous lesions are found and removed.[116] Disparities in access to screening tests and timely communication of results cause significant issues for racial and ethnic minorities.[117] Despite mixed findings regarding cancer screening disparities, research suggests people of color receive later stage diagnoses for some types of cancer compared to their white counterparts. For certain cancers, disparities in stage of diagnosis despite comparable screening rates may be related to screening guidelines not accounting for earlier onset and increased age-specific cancer incidence for different groups, as well as disparities in quality of screening techniques[118] and delays in diagnostic evaluation. [119]

Table 3 shows cancer screening rates overall and by race for breast, colorectal, prostate, lung and cervical cancers in Ohio, and nationally, compared to the Healthy People 2030 goals. Current screening guidelines for some cancers may also contribute to disparities by not accounting for differences in cancer risk across communities. Cancer screening guidelines have been developed based on clinical trials that largely underrepresented communities of color and, as such, may not reflect variations in cancer incidence and risk factors among different groups.

Approved screening tests are as follows:[120-125]

- Breast cancer
  - Mammography
- Cervical cancer
  - Pap smears
  - Human papillomavirus (HPV) testing
- Colorectal cancer
  - Colonoscopy
  - Stool tests
- Lung cancer
  - Low dose computed tomography (CT) scans
- Prostate cancer
  - Prostate-specific antigen (PSA) testing
- Multiple myeloma
  - Monoclonal gammopathy of undetermined significance (MGUS) testing

Table 3. Screening rates overall and by race for breast, colorectal, prostate, lung, and cervical cancers[a] in Ohio and nationally compared to Healthy People 2030 goals.

			Screening Rates (%)				
			Ohio			National	Healthy People 2030 Goals
			Overall	*Black/ African American*	*White*	*Overall*	*Overall*
Cancer Type	**Breast**	*Ages 50-74*	75.6%[b]	80.0%[b]	76.0%[b]	76.3%[h]	80.3%[m]
		Ages 40+	68.3%[c]	71.6%[c]	68.3%[c]	70.2%[h]	
	Colorectal		67.6%[d]	68.8%[d]	68.2%[d]	66.9%[i]	68.3%[n]
	Prostate		32.0%[e]	22.5%[e]	33.7%[e]	31.8%[j]	---- [o]
	Lung		12.5%[f]	---- [f]	12.9%[f]	9.9%[k]	7.5%[p]
	Cervical		77.4%[g]	85.2%[g]	76.1%[g]	77.7%[l]	79.2%[q]

[a]Multiple myeloma is not included in this table as no official screening guidelines currently exist for this cancer type.
[b]Estimates of the Ohio prevalence of women aged 50-74 who have had a mammogram within the past two years using **2022** Behavioral Risk Factor Surveillance System (**BRFSS**) data.REF1, REF2
[c]Estimates of the Ohio prevalence of women aged 40+ who have had a mammogram within the past two years using **2022 BRFSS** data.REF1, REF2
[d]Estimates of the Ohio prevalence of people aged 45-75 who have fully met the US Preventive Services Task Force (USPSTF) recommendation using **2022 BRFSS** data.REF1, REF2 USPSTF recommendations among adults aged 45-75 include receiving either annual fecal occult blood testing (FOBT), annual fecal immunochemical testing (FIT), stool deoxyribonucleic acid (DNA) testing every three years, colonoscopy every 10 years, computed tomography (CT) colonography every five years, flexible sigmoidoscopy every five years, or flexible sigmoidoscopy every 10 years with annual FIT.REF
[e]Estimates of the Ohio prevalence of men aged 40+ who have had a prostate-specific antigen (PSA) test within the past two years using **2020 BRFSS** data.REF1, REF2
[f]Estimates of the Ohio prevalence of people aged 50-80 who are current and former smokers who had a CT scan in the last year using **2022 BRFSS** data. A prevalence estimate is not available for African Americans due to the unweighted sample size for the denominator being < 50 or the confidence interval width being > 10 for any cell.REF1, REF2
[g]Estimates of the Ohio prevalence of women aged 21-65 who have had a Pap test in the past three years using **2020 BRFSS** data.REF1, REF2
[h]Estimates of the national prevalence of women aged 50-74 and 40+ who have had a mammogram within the past two years using **2022 BRFSS** data.REF
[i]Estimates of the national prevalence of people aged 50-75 who were up-to-date with colorectal cancer screening using **2022 BRFSS** data. Up-to-date is defined as having received FOBT in the past year, having received stool DNA testing in the past three years, having had a sigmoidoscopy in the past five years, or having had a colonoscopy in the past 10 years.REF
[j]Estimates of the national prevalence of men aged 40+ who have had a PSA test within the past 2 years using **2020 BRFSS** data.REF
[k]Estimates of the national prevalence of people aged 50-80 who are current and former smokers who had a CAT/CT scan in the last year using **2022 BRFSS** data.REF
[l]Estimates of the national prevalence of women aged 21-65 who have had a Pap test in the past three years using **2020 BRFSS** data.REF
[m]Healthy People 2030 set a goal to increase the proportion of all eligible females who receive a breast cancer screening to 80.3%.REF
[n]Healthy People 2030 set a goal to increase the proportion of all eligible adults who receive a colorectal cancer screening to 68.3%.REF
[o]There is no Healthy People 2030 goal for prostate cancer screening.
[p]Healthy People 2030 set a goal to increase the proportion of all eligible adults who receive a lung cancer screening to 7.5%.REF
[q]Healthy People 2030 set a goal to increase the proportion of all eligible women who receive a cervical cancer screening to 79.2%.REF

Specific Cancers

Breast Cancer

Mammography is recognized as an important strategy for reducing mortality from breast cancer (BC). Mammograms provide images of the breasts to be used for BC screening or diagnostic purposes and have been shown to reduce BC mortality in women aged 50-69 years by as much as 30%. Younger women aged 40-49 have also been shown to benefit from mammography with reduced BC mortality.[120,126]

BC screening guidelines vary. Controversies on BC screening recommendations involve screening frequency, use of advanced imaging technology, and need for supplemental imaging.[120] The American Cancer Society currently recommends women aged 45-54 to receive annual screening and women aged 55+ to receive biennial screening with the option to continue annual screening.[127] However, the US Preventive Services Task Force recommends women aged 40-74 to receive biennial screening.[128]

Tomosynthesis (3D mammography) is the currently recommended imaging standard.[129] Women who are high risk or have high breast density may be recommended to have supplemental imaging with MRI or automated breast ultrasound.[129] Women with greater than or equal to 75% breast density are at a four to six-fold greater risk of BC compared to those with fatty breasts.[130] Dense breasts are most prevalent among Asian women (66.0%) followed by non-Hispanic (NH) white (45.5%), Hispanic (45.3%), and African American (37.0%) women.[130]

Healthy People 2030 is a set of 10-year national objectives intending to encourage and measure US progression in important areas of public health, including cancer screening. For BC screening, the Healthy People 2030 goal is to achieve 80.3% uptake nationally by 2030. Ohio levels of BC screening uptake are like those nationally. In 2022, national and Ohio BC screening rates were below the Healthy People 2030 goal: 76.3% nationally and 75.6% in Ohio among women aged 50-74; and 70.2% nationally and 68.3% in Ohio among women aged 40+.

Unfortunately, there is inequitable access to mammography. Systematic review and meta-analysis of racial disparities in screening mammography show that disparities in utilization of screening mammography are most evident in African American and Hispanic populations in the U.S. Among African American and Hispanic women, the odds of receiving screening mammography are lower (by 19% and 17%, respectively) compared to NH white women. However, in Ohio, African American women have slightly higher BC screening uptake rates than do NH white women. Among Ohio women aged 50-74 in 2022, uptake was 80.0% among African Americans but 76.0% among NH whites. This trend is similar among Ohio women aged 40+ in 2022, with 71.6% uptake among African Americans but 68.3% among NH whites. However, uptake among both racial groups still falls below the Healthy People 2030 goal (80.3%). In addition to race, many other factors can contribute to inequitable access to BC screening. For example, those with lower income, lower education, poor health status, no insurance or absence of private insurance, no regular source of care, lack of knowledge of BC and BC screening, an unpleasant experience from prior mammograms, and lack of social support are less likely to receive BC screening mammography.[131,132]

Colorectal Cancer

Two common types of colorectal cancer (CRC) screening tests include colonoscopy and stool tests (e.g., fecal occult blood test [FOBT], fecal immunochemical test [FIT], and stool deoxyribonucleic acid [DNA] test). A colonoscopy uses a tube with a camera on the end to examine the inside of the colon and rectum. In addition to a screening test, a colonoscopy can also be a diagnostic test used to evaluate symptoms and follow-up other screening and diagnostic test results. Stool tests are less invasive and involve analysis of a stool sample for the presence of blood and sometimes DNA.[133]

According to the US Preventive Services Task Force and the American Cancer Society, most people should receive CRC screening from ages 45 to 75. However, the frequency and most appropriate type of CRC screening test can vary. It is important to consult with a doctor to determine proper screening strategy. FOBTs and FITs are done once a year at home. Stool DNA tests are also done at home, but only once every three years. Colonoscopy is performed by a doctor once every ten years for those with an average risk of CRC.[133,134]

In Ohio, recent CRC screening rates match national rates. CRC screening uptake in 2022 was 66.9% nationally and 67.6% in Ohio; however, both of these rates are lower than the Healthy People 2030 goal of 68.3%. Uptake is also similar between NH white and African American Ohioans, at 68.2% and 68.8%, respectively, in 2022. These rates are higher than the overall Ohio rate, indicating the need to increase CRC screening uptake among other racial groups to improve the state-level rate. While CRC screening uptake is similar between NH whites and African Americans,[18] Asian Americans have lower CRC screening rates.[135] CRC screening rates among Asian Americans are as much as 10% lower than those of NH whites and African Americans.[135] Further, the 2019 Ohio Department of Health Cancer Atlas shows lower CRC screening rates in rural counties and inconsistent trends in metropolitan and suburban counties.[136] However, county level numbers do not adequately represent the complex interactions between race, socioeconomic status, rurality, and other factors that affect CRC cancer screening.[136]

Multiple Myeloma

Monoclonal gammopathy of undetermined significance (MGUS) is a disorder where atypical protein – monoclonal protein, or M protein – is present in the blood. M proteins are mutated antibodies produced by plasma cells that have turned into cancerous myeloma cells. Multiple myeloma (MM) begins as MGUS, but not all cases of MGUS will lead to MM. MGUS usually is harmless and asymptomatic. Therefore, screening for M protein is not typically recommended (and, consequently, data are lacking on uptake of this screening). Often, MGUS is an incidental finding when a patient is evaluated after presenting with certain conditions (e.g., anemia, bone issues, or raised creatinine). However, regular checkups are necessary for those with MGUS. M protein levels must continuously be observed to monitor for MGUS progression (a rise in the level of M proteins in the blood) to symptomatic MM. Ultimately, MGUS testing is a valuable method of screening for MM, allowing for earlier detection and treatment of MM.[137,138]

Racial disparities in the prevalence of MGUS are well-established.[139,140] While MGUS is present in only 3% of the general population aged 50 and older, MGUS affects approximately 10% of African Americans over 40 years old.[139] Specifically, African American populations have a two to three times higher risk of MGUS compared to non-Hispanic whites.[140] Further, African American race may be a risk factor for progression of MGUS to MM.[139,141,142] It is therefore imperative to promote awareness of MGUS and MM among African Americans to improve use of MGUS testing and reduce MM burden among this group.

Cervical Cancer

Pap smears and human papillomavirus (HPV) testing are powerful tools to help prevent cervical cancer (CC) or to catch CC early. A Pap smear screens for precancerous cervical cells that have the potential to lead to CC if not treated, whereas HPV testing screens for the presence of HPV on the cervix, as HPV can cause CC.[143]

Currently, an update to the US Preventive Services Task Force (USPSTF) CC screening recommendations is in progress.[144] However, the most recent (2018) published USPSTF CC screening guidelines are: women aged 21-29 years should receive a Pap smear every three years; women aged 30-65 years should either (1) receive a Pap smear every three years, (2) receive HPV testing every five years, or (3) receive a Pap smear and HPV testing (cotesting) every five years.[144] American Cancer Society (ACS) CC screening guidelines vary from those of the USPSTF.[144,145] As of 2020, the ACS recommends women aged 25-65 years receive HPV testing every five years.[145] Cytology and HPV testing remain the primary opportunity for pre-invasive detection and timely management. Women should also be informed to notify their healthcare provider for changes in bleeding patterns, abnormal vaginal discharge and pelvic symptoms like changes in bladder or bowel habits.

Although extremely effective in CC prevention, Pap smears and HPV testing are underutilized.[103] Only an estimated 70%-80% of eligible individuals are up to date with recommended screening practices.[103] Racial disparities are evident in CC screening rates.[103,146] One study found that African American women had the lowest uptake of CC screening (Pap smear and/or HPV testing) among all racial groups nationally at 53.2%.[103] Interestingly, non-Hispanic (NH) white women had the next lowest CC screening uptake (63.5%).[103] Compared to NH white women, Hispanic (65.4%) and Asian/Pacific Islander (66.5%) women had significantly greater CC screening rates.[103] However, another study found that Asian, Native Hawaiian, American Indian/Alaskan Native, and Hispanic women all had significantly lower odds of CC screening via Pap smear than did NH white women.[146] This study also showed that Pap smear uptake was similar between African American and NH white women.[146]

Data from the 2020 Behavioral Risk Factor Surveillance System (BRFSS) show that CC screening uptake among Ohio women matches that of women nationally, with rates of 77.4% and 77.1%, respectively. However, in Ohio, African American women had a 2020 CC screening rate that was over 10% higher than that of their NH white counterparts (85.2% vs. 76.1%). This uptake among African American women in Ohio has surpassed the Healthy People 2030 CC screening goal of 79.2%. While this is a promising finding, the rates of CC screening overall in Ohio and nationally remain below this goal.

Prostate Cancer

Prostate-specific antigen (PSA) testing is the most common type of prostate cancer (PC) screening. PSA is a protein that is produced by both normal and cancerous prostate tissue. Typically, PSA levels are low in the blood in the absence of PC. However, PC cells produce more PSA than do noncancerous prostate cells. Consequently, elevated PSA levels in the blood may indicate the presence of PC.[147]

Currently, an update to the US Preventive Services Task Force (USPSTF) PC screening recommendations is in progress.[148] However, the most recent (2018) published USPSTF PC screening guidelines are: men aged 55-69 years should discuss the possible harms and benefits to receiving PC screening through PSA testing with their doctor to decide if PSA testing is right for them.[148] The USPSTF does not recommend men aged 70 and older receive PC screening.[148] American Cancer Society (ACS) guidelines for PC screening are comparable to those of the USPSTF.[148,149] However, the ACS recommends that discussion about PC screening through PSA testing begin at age 50 and continue until there is less than a 10-year life expectancy.[149]

The greatest potential benefit of PSA testing is that this screening can reduce the risk of mortality from PC. Potential harms of and reasons not to receive PSA testing include false-positive results leading to additional testing and potential prostate biopsy, overdiagnosis and overtreatment of PC, and complications of treatment like incontinence or erectile dysfunction. Family history, race/ethnicity, comorbidities, patient personal values, and the levels of PSA present during previous screening should be considered when deciding whether to receive PSA testing.[148]

Prior to the COVID-19 pandemic (2018), national rates of PC screening were higher among African American men (55%) than non-Hispanic (NH) white men (45%). However, PC screening uptake declined from 2020-2021 among men of all racial groups. PC screening uptake among Ohio men was only at 32.0% in 2020; the national rate was even lower at 31.8%. Further, in Ohio, PC screening uptake fell to 33.7% among NH white men and 22.5% among African American men in 2020. In 2022, PSA testing rates began to increase in both African American and NH white men nationally, but the rate of increase was slower among African American men. PC screening uptake rose to 53% for both NH white and African American men in 2022. This shows that among African American men, the rate of PSA testing is now lower post-pandemic than it was pre-pandemic. However, the rate of PSA testing ultimately increased in NH white men from 2018-2022. Further, the advantage in PC screening rates that African Americans exhibited over NH whites pre-pandemic has since disappeared.[150]

Lung Cancer

Chest low dose computed tomography (CT) for lung cancer (LC) screening reduces LC mortality rates.[123,151] However, eligibility criteria for LC screening come from studies of majority non-Hispanic (NH) white and high SES populations.[123,152,153] Consequently, results of these trials are not generalizable to marginalized groups like racial and ethnic minorities and those with low income.[123,152,153] Therefore, the eligibility criteria are likely to exclude members of these high-risk groups from receiving appropriate LC screening. [123,152,153]

Current US Preventive Services Task Force (USPSTF) LC screening recommendations are annual screening for 50–80-year-old (1) current smokers with a 20+ pack-year smoking history or (2) former heavy smokers who quit within the past 15 years.[154] American Cancer Society (ACS) LC screening guidelines are similar to those of the USPSTF. The ACS recommends annual LC screening for both current and former smokers aged 50-80 years with a 20+ pack-year smoking history.[155] Under these guidelines, over 14 million people are eligible for LC screening in the US.[156] Unfortunately, uptake of LC screening is terribly low among all racial groups.[156] Less than 5% of eligible NH whites nationally are up to date with LC screening.[156] National uptake of LC screening is even more abysmal among African Americans, with less than 2% of eligible African Americans receiving LC screening.[156] The overall national rate of PC screening in 2022 was somewhat better, at 9.9%. Compared to this national rate, Ohio PC screening uptake in 2022 was slightly higher (12.5%). Healthy People 2030 set a goal to reach 7.5% uptake for LC screening. Major efforts are necessary to improve the rate of LC screening among African Americans nationally as current uptake among this population is only at about one-fourth of this Healthy People 2030 goal.

The smoking practices and age requirements of LC screening recommendations disqualify many high-risk African Americans from receiving LC screening.[154] African Americans typically have fewer pack-years and are diagnosed with LC at younger ages.[157,158] Further, African American smokers have longer quit times than do NH whites for quitting smoking,[159,160] and the risk of LC does not significantly reduce for quit times longer than 15 years.[161-163] But former smokers lose their eligibility for LC screening under USPSTF once they have quit for longer than 15 years.[123] Research is required to determine which LC screening criteria are most appropriate and provide the greatest benefit to marginalized groups.

DIAGNOSIS

Timely and accurate diagnosis of cancer is essential for treatment planning and improved health outcomes. Diagnosis includes confirmation of cancer through imaging, biopsies, and laboratory tests. Once confirmed, coordination across medical specialties should follow to quickly begin treatment.[164]

Unfortunately, diagnostic errors disproportionately affect minorities due to implicit biases and lack of diverse data in diagnostic algorithms.[165] Healthcare providers are less likely to inform African American and Hispanic patients about incidental findings and follow-up recommendations, leading to delayed diagnoses and decreased adherence to care.[117]

Specific Cancers

Breast Cancer

Breast cancer (BC) diagnosis usually begins with an abnormal finding during a clinical breast exam and/or screening mammography. A combination of diagnostic mammography, breast ultrasound, breast magnetic resonance imaging (MRI), and breast tissue needle biopsy is then used for final diagnosis of BC. To determine the stage of BC, blood tests, bone scans, computed tomography (CT) scans, additional MRI scans, and positron emission tomography (PET) scans may be used. Stages of BC range from 0-4. Cancer stages generally reflect how widely the cancer has spread from the original site, with higher numbers indicating greater spread. Stage 0 BC is BC contained within a breast duct. Stage 4 of BC is metastatic BC where the BC has spread beyond lymph nodes to other organs.[166,167]

Across 2017-2021, non-Hispanic (NH) white women had the highest incidence of BC (139.0 per 100,000).[168] During the same period, BC incidence was slightly lower among African American women, at 129.3 per 100,000.[168] Hispanic women had the lowest incidence of BC during this period (101.2 per 100,000).[168] BC stage at diagnosis also varies greatly by race.[169] While African American women had lower BC incidence than NH white women from 2017-2021,[168] the odds of late-stage BC were nearly 50% higher in African American compared to NH white women in 2017.[169] African American women have historically had less access to BC screening – due to inadequate health insurance, high screening costs, and far distances to mammography facilities, for example – consequently leading to a greater likelihood of late-stage BC diagnosis.[170]

Further, African American and Hispanic women have been found to exhibit longer times to diagnostic follow-up after receiving abnormal mammography results than NH white women. The median number of days between receiving abnormal mammogram findings and receiving diagnostic testing is 20 days among African American women and 21 days among Hispanic women, compared to only 14 days among NH white women. Delays in follow-up can lead to diagnosis of BC at later stages.[171]

Colorectal Cancer

Diagnosing colorectal cancer (CRC) includes diagnostic colonoscopy and colorectal tissue biopsy. CRC stages range from 0-4; imaging scans of the abdomen, pelvis, and chest are used to determine CRC stage. Stage 0 is CRC that is only inside the innermost layer of the colorectal wall (i.e., the colorectal mucosa).[172]

African Americans have the highest risk of CRC diagnosis in the US. Surveillance, Epidemiology, and End Results (SEER) program data show that the incidence of CRC is 41.9 per 100,000 in African Americans, compared to 37.0 per 100,000 in non-Hispanic (NH) whites. This disparity in CRC incidence is greatest among African Americans younger than 45 years old, which indicates that factors contributing to this gap in CRC diagnosis begin their impact prior to age 45, which is the youngest recommended CRC screening age.[173] Additionally, African Americans are more likely to be diagnosed with late-stage CRC cancer than are NH whites, which can lead to poorer CRC survival rates.[174]

Data stratified by race on time to diagnostic follow-up after abnormal stool test result are lacking. However, overall, observed rates of follow-up colonoscopy among those with an abnormal stool test result are low.[175] One study found that only around half of those with abnormal findings from an at-home stool test sought follow-up colonoscopy.[175] In this study, those with abnormal stool test results who did not receive follow-up colonoscopy had two times the risk of death as those who did receive follow-up colonoscopy.[175] In the setting of racial disparities in cancer outcomes, this is particularly alarming, as racial minorities have been observed as susceptible to not completing follow-up/a delay in follow-up after abnormal screening results for other cancers.[171,176] Additionally, there is a paucity of research on the optimal time interval between abnormal stool test result and diagnostic colonoscopy. But one study suggests diagnostic colonoscopy should occur within one year after receiving abnormal stool test results to minimize risk of CRC mortality.[177]

Multiple Myeloma

Diagnostic tests for multiple myeloma (MM) include blood, urine, and bone marrow tests as well as positron emission tomography (PET) and magnetic resonance imaging (MRI) scans. Important blood tests in the diagnosis of MM include assessment of the levels of two different proteins in the body that are made by myeloma cells: monoclonal protein (M protein) and beta 2-microglobulin protein. MM stages range from 1-3. Stage 1 MM is slow growing; stage 3 MM grows quickly. Blood tests are used to stage MM by measuring levels of beta-2-microglobulin, albumin, and lactate dehydrogenase in the body.[178]

There are significant racial differences in MM incidence across all stages. African Americans have two times the risk of MM compared to non-Hispanic (NH) whites. African Americans also tend to be diagnosed with MM at earlier ages than NH whites. Further, the incidence of MM is lower among Asians (3.8 per 100,000) than NH whites (6.2 per 100,000). Unfortunately, African American MGUS and MM patients are underrepresented in research studies, which has limited our understanding of the reasons for these racial disparities.[142]

As rates of progression from monoclonal gammopathy of undetermined significance (MGUS) to MM are low overall, experts usually recommend follow-up six months after M proteins are first observed in the blood. Because there is a lack of observational data on the optimal follow-up time after MGUS diagnosis, guidelines rely on expert opinions.[179] As African Americans are underrepresented in MM research – although this group is disproportionately affected by MM[142] – future research is necessary to evaluate rates of diagnostic follow-up after receiving a positive MGUS test among African Americans.

Cervical Cancer

Diagnosis of cervical cancer (CC) begins with a colposcopic exam following a positive Pap smear and/or human papillomavirus (HPV) test. This is an exam of the cervix which uses a colposcope to magnify the cervix when obtaining a sample of cervical cells. During the exam, cervical cells are sampled using either a punch biopsy (pinches off small samples of cervical tissue) or endocervical curettage (scrapes a tissue sample from the cervix). If cervical cells appear to be cancerous, additional tests like loop electrosurgical excision procedure (LEEP) or cone biopsy may be performed to collect a deeper layer of cervical cells for testing. Once diagnosed with CC, imaging tests – like X-ray, magnetic resonance imaging (MRI), and positron emission tomography (PET) scans – and endoscopic examination of the bladder and rectum are used to determine the stage of CC, which range from 1-4. Stage 1 indicates the CC is confined to the cervix.[180]

CC incidence is highest among African American (8.3 per 100,000) and Hispanic (9.3 per 100,000) women.[146] Among non-Hispanic (NH) white women, CRC incidence is only 7.4 per 100,000.[146] Further, among all racial groups, African American and Hispanic women are most likely to be diagnosed with late stage CC.[181] In fact, African American women are more likely to be diagnosed with regional (CC has spread beyond the cervix or to regional lymph nodes) than localized (CC is confined to the cervix) CC.[181]

Inadequate diagnostic follow-up after abnormal CC screening results occurs across all racial groups (less than half of women receive timely follow-up), but lack of follow-up is greatest among African Americans.[182] Approximately one-fourth of African American and Hispanic women with abnormal CC screening results have delays in follow-up.[182] African American women are most likely to never receive follow-up after abnormal CC screening findings.[181] Having health insurance is strongly associated with receiving diagnostic follow-up after abnormal CC screening results.[181] Since African Americans and Hispanics are less likely to be insured than are NH whites,[181] improving insurance coverage may, therefore, improve diagnostic CC follow-up rates within these marginalized communities.

Prostate Cancer

If an atypical level of prostate-specific antigen (PSA) is found in the blood following prostate cancer (PC) screening, further testing will be performed to identify whether prostate cancer is present. Testing may include ultrasound, magnetic resonance imaging (MRI), and prostate tissue biopsy. A grading system is used to specify PC aggressiveness. To determine PC stage, bone scan, ultrasound, computed tomography (CT) scan, MRI scan, and positron emission tomography (PET) scan may be used. Stage 1 indicates the PC is confined to the prostate.[183]

There is a large racial disparity in PC diagnosis between African American and NH white men.[184] In the US, African American men have 60% greater incidence of PC than do NH white men.[184] Further, a greater proportion of PC is diagnosed at later stages, likely due to lower rates of screening, – as well as assigned higher Gleason scores – among African American men compared to among NH white men.[184] African American men also tend to experience earlier presentation of PC compared to NH white men.[185]

Since PSA levels can fluctuate in the blood throughout the month, a second PSA test should be performed four to six weeks following abnormal PSA testing results. Delayed follow-up between abnormal screening results and diagnostic testing can lead to diagnosis of PC at later, more aggressive stages. One study found similar delays in follow-up after abnormal PSA testing results between African American and NH white men (hazard ratio=1.05; 95% confidence interval=0.78-1.43). On

average, time between abnormal PSA test result and follow-up was 115 days. Although African American and NH white men had similar follow-up delays, this still puts African American men at a disadvantage for positive PC outcomes compared to NH white men. This is because African American men often present with PC of greater Gleason scores and later stages than do NH white men. This study demonstrates the need for intervention to reduce delays in follow-up after abnormal PSA findings among African American men.[186]

Lung Cancer

Blood tests, additional imaging, and tissue biopsies may be performed to diagnose lung cancer (LC) if a chest low dose computed tomography (CT) scan produces concerning findings during LC screening.[187] LC staging tests include magnetic resonance imaging (MRI) scans, additional CT scans, bone scans, and positron emission tomography (PET) scans.[188] LC stages range from 1-4, with stage 1 LC being LC that is only inside the lung.[188] Unequal implementation of LC screening within underserved populations compared to within non-marginalized groups impacts diagnosis among racial minorities.[189,190] Recent data show that the age-adjusted incidence rate (AAIR) of LC is 14% higher among African American men compared to that among non-Hispanic (NH) white men.[191] Further, among women, African Americans have the highest rates of LC incidence.[191] Racial minorities are also more likely to be diagnosed at later, more advanced LC stages.[108] These stages require more aggressive and expensive treatments and have lower rates of survival.[108] African Americans are less likely to receive PET/CT imaging at diagnosis than are NH whites at all LC stages.[192] African Americans are also diagnosed with LC at younger ages than are NH whites.[192]

Overall, insufficient data exist on rates of diagnostic follow-up after an abnormal LC screening test result. Given that gaps in follow-up adherence by race and ethnicity have been recorded for other types of cancer screening, it is likely that racial disparities are also present in follow-up for abnormal LC screening results.[176]

TREATMENT

Cancer treatment is complex and unique to cancer type, stage, and individual patient needs. Treatment usually involves a combination of surgery, radiation therapy – which treats cancer using powerful energy beams, chemotherapy – which treats cancer using strong medicine, and immunotherapy – which treats cancer using medicine that aids the immune system in finding and killing cancer cells. Cancer treatment plans can include curative treatment (aims to achieve complete cancer remission and prevent recurrence), non-curative/life-extending treatment (aims to meaningfully extend survival in cases of incurable cancer), and palliative treatment (aims to reduce cancer pain/symptoms and improve quality of life regardless of prognosis or survival benefits).[193]

Minority populations face longer delays in and poorer communication about cancer treatment plans, resulting in lower treatment rates and adherence. Racial minorities are also less likely to receive stage-appropriate treatment or guideline-recommended care. Further, lack of adequate insurance coverage has been documented among minorities, which can inhibit access to cancer treatment. These disparities and barriers in access to treatment create higher risk of worse cancer health outcomes among marginalized populations.[194,195]

Specific Cancers

Breast Cancer

Breast cancer (BC) treatment plans vary depending on cancer stage and whether the cancer is sensitive to hormones. Often, treatment of BC begins with surgery – lumpectomy or mastectomy – to remove the cancer. Lumpectomy is breast-conserving surgery where the BC is removed as well as some of the surrounding healthy breast tissue. Mastectomy involves removal of all breast tissue. Radiation therapy, chemotherapy, and/or hormone therapy typically follow surgery.[196]

Radiation therapy for BC treatment is usually external beam radiation but can sometimes be internal (brachytherapy). Chemotherapy involves a combination of medications given through a vein or in pill form that can be used to kill cancer cells, shrink the tumor, and/or control the spread of the cancer. Further, hormone therapy is used to treat BCs that are sensitive to estrogen and progesterone. These types of BCs use estrogen and progesterone to grow, so if these hormones are blocked, the cancer cells shrink or die. Hormone therapy either prevents hormones from attaching to cancer cells, inhibits the body from producing estrogen after menopause, or stops the ovaries from producing hormones. Targeted therapy may also be used to attack chemicals that allow BC cells to survive and grow. Most commonly, the HER2 protein is targeted. Immunotherapy may be an option to treat triple-negative BC, which does not have cell receptors for estrogen, progesterone, or HER2.[196] Treatment disparities are well established across these multimodal therapies.

Racial and ethnic disparities in BC treatment have been widely documented.[197] Compared to non-Hispanic (NH) white women, African American women and Hispanic women are less likely to receive surgery of any type for treatment of BC.[197] With local therapy there are differences in acceptance of breast conservation with minority women, especially Black, receiving mastectomy more than other groups. Along with this is data showing lower rates of breast reconstruction in minority women who have mastectomy. "Low value surgery" which are procedures that are no longer standard of care, or provide no clinical benefit is disproportionately performed in minority patients. Further, African American women diagnosed with BC receive treatment that has curative intent at a lower rate than do NH white women.[197] BC treatment among African American women also is often lower in quality than is treatment among NH white women.[198] Additionally, time between BC diagnosis and initiation of treatment tends to be longer in African American women compared to NH white women.[198] Lower BC treatment adherence is also observed in African American women than in NH white women.[198] There are disparities in radiation therapy, with patients residing in non-metro areas less likely to have access to treatment. This also increases utilization of mastectomy if radiotherapy is not accessible. Lastly, treatment disparities in systemic therapy are well documented. For chemotherapy, the treatment recommendations have been shown to differ among various racial and ethnic groups. Also, when initiated, treatment completion differs with Black women having higher rates of incompletion or early termination. For endocrine therapy, long term compliance is a major problem with women stopping the medication before the recommended 5 years. Black women especially have lower adherence rates.
Final treatment refusal across all modalities is increased among Black and other minorities which results in increased cancer specific mortality.[199-203]

Colorectal Cancer

Treatment for early stages of colorectal cancer (CRC) is usually minimally invasive. Polypectomy may be performed in which small cancerous polyps are removed during colonoscopy. Endoscopic mucosal resection can remove larger polyps during colonoscopy as well as small amounts of colorectal lining. Laparoscopic surgery – surgery utilizing small cameras inside the body – can be used to remove polyps that are unable to be removed during colonoscopy.[204]

Later stages of CRC are treated using more invasive methods. Advanced CRC may require the segment of the colon that has cancer to be entirely removed via a partial colectomy. Typically, the remaining healthy colon can be reconnected. However, if it is not possible to reconnect the portions of healthy colon, an ostomy – where an opening in the abdominal wall is created from remaining colon – is necessary to allow stool to leave the body through a bag externally attached to the abdomen. While early-stage CRC can usually be treated entirely through surgery, late-stage CRC sometimes requires chemotherapy, radiation therapy, targeted therapy, or immunotherapy in addition to surgical treatments.[204]

Nationally, minority race is associated with lower rates of surgery and chemotherapy for CRC treatment.[205] African American CRC patients in the US are least likely to receive any CRC treatment at all, and are less likely to receive treatment that has curative intent than are non-Hispanic whites.[206] Further, African Americans experience longer delays between CRC diagnosis and initiation of treatment.[207] We unfortunately lack granular data to understand disparities in CRC treatment based on race in Ohio. However, in Ohio, lower rates for complex gastrointestinal cancer surgery were associated with neighborhoods of high poverty and largely African American.[122]

Multiple Myeloma

Treatment for multiple myeloma (MM) may not be needed immediately, as MM can be asymptomatic (smoldering MM). Unlike for other cancers, surgery is not the first step for MM treatment. Rather, targeted therapy, immunotherapy, and chemotherapy are used. Chimeric antigen receptor T-cell (CAR-T cell) therapy is also a treatment option for MM. CAR-T cell therapy trains the immune system to fight MM. In CAR-T cell therapy, patient white blood cells (WBCs) are treated in a laboratory to cause them to produce special receptors which aid them in recognizing myeloma cells. The WBCs are then replaced into the body. Additionally, corticosteroids may be employed to control inflammation and work against myeloma cells.[208]

The most common surgical treatment for MM is a bone marrow transplant – also known as stem cell transplant – in which diseased bone marrow is replaced with healthy bone marrow. There are two types of bone marrow transplants: autologous and allogenic. Autologous bone marrow transplants first collect stem cells from the patient's blood, next use chemotherapy to destroy diseased bone marrow, and then return the stem cells into the body so that these stem cells can rebuild bone marrow. Allogenic bone marrow transplants use healthy bone marrow from a donor.[208]

Racial disparities are evident in MM treatment. Both African Americans and Hispanics tend to have significantly longer times from MM diagnosis to treatment initiation compared to non-Hispanic (NH) whites. One study found that the median length of time between diagnosis and treatment of MM was only 2.7 months among NH whites but 5.2 months among African Americans and 4.6 months among Hispanics. Further, Hispanics are less likely to receive autologous bone marrow transplants than are NH whites. African Americans also have lower likelihood of receiving a combination of multiple therapies for MM treatment compared to NH whites.[209]

Cervical Cancer

Cervical cancer (CC) that is confined to the cervix can typically be treated with surgery. CC that has grown beyond the cervix requires surgical treatment in combination with radiation therapy, chemotherapy, targeted therapy, and/or immunotherapy. Cancer size, stage, and whether the patent may ever like to become pregnant determine which surgery is most appropriate. Small CCs may be treated with a cone biopsy, in which a cone-shaped area of cancerous cervical tissue is removed. Cone biopsies leave the uterus and the remainder of the cervix intact, so it may be possible to become pregnant in the future. Small CCs may also be treated using a trachelectomy which removes the cervix entirely, as well as some surrounding tissue. Because the uterus remains intact, future pregnancy may be possible. Finally, a hysterectomy can be used to treat CC. During a hysterectomy, the full cervix, full uterus, and part of the vagina are removed. This eliminates the possibility of future pregnancy.[180]

Treatment of CC among women of racial minorities varies compared to treatment received by non-Hispanic (NH) white women.[210,211] For example, the prevalence of hysterectomy for CC treatment is higher in African American women than in non-Hispanic (NH) white women.[210] African American women are also less likely to receive radiation therapy for CC treatment than are NH white women.[211] Compared to NH white women, there is a longer delay between CC diagnosis and start of CC treatment among African American women.[211] African American women are also less likely to receive combination therapy – like radiation therapy with chemotherapy – to treat CC than are NH white women.[210]

Prostate Cancer

Prostate cancer treatment includes various options like active surveillance, surgery, radiation therapy, hormone therapy, chemotherapy, immunotherapy, targeted therapy, bisphosphonates, cryosurgery, HIFU, and proton beam radiation.[212] The choice of treatment depends on the cancer's stage, patient's health, side effects, and preferences. Low-risk cases may opt for surveillance, while intermediate-risk cases could include surgery or radiation.[212] High-risk cases often require a combination of treatments. For advanced cancer, hormone therapy, chemotherapy, and radiopharmaceuticals are common. Side effects vary, including incontinence, erectile dysfunction, and hormonal changes.[212] Emerging treatments

like prostate cancer vaccines and focal therapies are being explored, with clinical trials offering access to new treatments.[212,213]

There are observed disparities in prostate cancer treatment. Study findings show that Black patients have lower frequencies of surgery compared with white patients after adjusting for age and cancer grade, for example, is consistent with prior studies.[214] African American men are typically diagnosed with prostate cancer at a younger age and at more advanced stages than white men.[213] They also receive definitive treatments like surgery or radiation less frequently for localized prostate cancer. Additionally, there is a disparity in the use of newer treatments, such as immunotherapy and targeted therapy, with these being less commonly utilized among racial minorities.[214]

Lung Cancer

Treatment for lung cancer (LC) often begins with surgery. Methods to remove LC include wedge resection – removes the small section of lung that is cancerous, segmental resection – removes the large section of lung that is cancerous, lobectomy – removes the entire lobe of a lung, and pneumonectomy – removes the entire lung. Radiation therapy, chemotherapy, targeted therapy, and immunotherapy often follow surgery. Stereotactic body radiotherapy can also be used to treat LC that cannot be treated with surgery or that has spread beyond the lungs. This treatment aims radiation beams at the LC from many different angles.[188]

Unfortunately, disparities in treatment of LC exist by race and ethnicity.[215,216] African American patients are less likely to receive surgical LC treatment and any LC treatment at all compared to non-Hispanic (NH) white patients.[215] Specifically, African Americans with LC are 19% less likely to receive surgical treatment and 11% more likely to not receive any treatment.[215] Further, Hispanic patients are 30% more likely to not receive any LC treatment than are NH white patients.[216] Compared to NH whites, longer delays between LC diagnosis and initiation of LC treatment have also been documented among racial and ethnic minorities.[216]

Multiple factors contribute to these disparities, including low socioeconomic status and lack of health insurance coverage,[215,216] implicit bias among healthcare providers,[217] and communication issues and lack of trust between patients and physicians.[217] Additionally, higher rates of comorbidities in African American patients may lead to less aggressive treatment.[217]

SURVIVORSHIP

Survivorship is the period after treatment, focused on the physical, mental, social, financial, and health related challenges among survivors.[1,11] Cancer survivors often experience long-term and late effects of treatment, including fatigue, pain, lymphedema, and cognitive impairment ("chemo brain").[218] They may also face an increased risk of secondary cancers and other chronic health conditions. Ongoing monitoring for cancer recurrence and management of treatment side effects are critical aspects of survivorship care.[218] Many survivors struggle with anxiety, depression, fear of cancer recurrence, and post-traumatic stress.[165,218] The transition from active treatment to survivorship can be psychologically difficult, as survivors may feel a loss of support and uncertainty about their future health.[218] Cancer survivorship can impact relationships, social roles, and the ability to return to work or school.[218,219] Survivors need to navigate a complex healthcare system for follow-up care, including regular screenings, management of long-term side effects, and coordination between oncology and primary care providers.[218] Racial and ethnic minorities survivors experience higher rates of adverse side-effects, poorer quality of life, and higher financial burden following treatment. Interventions targeting follow-up care and patient support services can help alleviate the burden among underserved survivors.[11] Racial and ethnic minority survivors face disproportionate burdens in many areas. Minority survivors often experience more severe and persistent treatment-related side effects, which can impact their quality of life and ability to return to normal activities.[165].Factors such as limited access to high-quality healthcare, cultural barriers, and socioeconomic disparities contribute to lower overall quality of

life among minority survivors.[165] Minority survivors are more likely to experience financial hardship due to cancer, including problems paying medical bills, depletion of savings, and bankruptcy.[219]

Specific Cancers

Breast Cancer

Advances in surgical management and the discovery of new medical therapies have resulted in an overall 5-year relative survival of 90%.[220] The increase in survival combined with the growth and ageing of the US population have produced a rise in the number of cancer survivors ~ 3.8 million women.[220,221] After completion of the received treatment modalities of surgery, radiation and chemotherapy, a treatment summary, or Survivorship Care Plan is completed. There remains however, unmet supportive care needs, including psychological distress and deficits in physical functioning. Many cancer centers offer group coaching and counseling sessions on a variety of topics including psychological services, exercise counseling, and nutrition counseling. Access to these programs can be limited to at risk groups in vulnerable communities (e.g., rural, immigrant, low SES) [222,223]. Lack of interventions to reduce barriers and facilitate access to survivorship care and services, to maintain adherence to surveillance and therapy (anti-estrogen medication).[223]

Black women have lower 5-year survival rates for breast cancer compared to white women (81% vs 92%). This gap in survival rates has persisted over time, indicating ongoing disparities.[71] The mortality rate for breast cancer is approximately 42% higher among Black women compared to white women. This substantial difference highlights the severity of the disparity.[71] Studies also show that Black breast cancer survivors report poorer quality of life and physical and mental health compared to white survivors.[224]

Colorectal Cancer

Colorectal cancer survivorship shows significant racial disparities, particularly between Black and white patients. Black patients have higher in-hospital mortality rates compared to white patients.[225] Black patients have lower 5-year survival rates for colorectal cancer compared to white patients.[226] This disparity is especially pronounced in younger patients, with African Americans diagnosed at a young age having significantly worse survival rates than young white patients.[226] The disparities are due to multiple factors, including differences in access to preventive healthcare services like cancer screening, genetic predisposition, and higher prevalence of colorectal cancer risk factors among Black individuals.[227]

Multiple Myeloma

The creation of a survivorship plan is a key component for MM survivors. This plan becomes key for long term treatment for individuals who have MM. This detailed list should include your treatment history, follow-up care schedule (checkups, medical tests, scans), potential long-term side effects to look out for, and strategies for staying healthy.[228] It is also important to create a plan for adjusting to changes in mobility, health, diet and accessing a support system to include access to counseling services. Because multiple myeloma has a high chance of coming back, patients will continue to see your oncologist or take medications over the long term, even once the disease is under control.[228] A survivorship care plan is important in that it can support patients with their follow-up care and either prevent relapses or catch the cancer as soon as it comes back.[228]

From 1999 to 2020, mortality rates for multiple myeloma (MM) declined consistently across all racial and ethnic groups.[229] Non-Hispanic Black individuals had the highest mortality rates throughout, decreasing from 9.60 to 7.33 per 100,000.[229] Non-Hispanic American Indian/Alaska Native (AIAN) and Asian American/Pacific Islander (AAPI) individuals had the lowest rates, with declines from 4.74 to 2.47 per 100,000 for AIAN and from 2.73 to 1.89 per 100,000 for AAPI. MM incidence was consistently higher among non-Hispanic Black individuals, with men showing slightly higher rates than women, despite declines in mortality rates over the period.[229]

Cervical Cancer

For women with cervical cancer there can be substantial impact on their lives. They will require routine follow up with gynecologic exam at regular intervals for several years following therapy. Many patients may experience the toxicities associated with radiation therapy including vaginal stenosis/scarring, bladder and bowel changes and early onset menopause. Sexual function may be significantly impacted by cervical cancer therapy. Aside from long term symptom control that may be required for patients who undergo therapy for cervical cancer there is significant symptoms that may be associated with recurrence and upfront diagnosis including heavy bleeding requiring transfusion, pain including neuropathic pain and hydronephrosis which is swelling of the ureter. Hydronephrosis may require percutaneous nephrostomy tubes and have significant impact on an individual's life.

Black women experience the highest overall mortality rates and the lowest 5-year relative survival rates for cervical cancer, regardless of subtype and stage.[230] Racial disparities in cervical cancer have persisted for decades in the United States, and present one of the widest Black-white mortality differences of any cancer.[230] While Black women are less likely to be diagnosed with cervical adenocarcinoma compared to all other racial and ethnic groups, they experience the highest mortality rates for this subtype. This is likely attributed to the poor survival observed among Black women with regional and distant stages of cervical adenocarcinoma[230]

Prostate Cancer

Overall, survival rates for prostate cancer are high in the United States. The 5-year relative survival rate for men diagnosed with prostate cancer is 99%, the 10-year relative survival rate is 98%, and the 15-year relative survival rate is 95%.[231] However, survival rates vary significantly by stage at diagnosis. For localized prostate cancer (confined to the prostate) and regional prostate cancer (spread to nearby structures), the 5-year relative survival rate is nearly 100%. Yet for metastatic prostate cancer, the 5-year relative survival rate drops to about 34%.[231] Diagnosis of advanced cancer has increased over the years

Survival for prostate cancer patients often entails regular medical checkups and monitoring, including follow-up appointments, PSA tests, and imaging tests to detect any recurrence. Physical exams, such as digital rectal exams, are also common. Managing treatment side effects, maintaining general health through diet and exercise, and addressing chronic conditions are important.[231] Psychological support through counseling or support groups helps with the emotional impact, while ongoing treatments like hormone therapy may be necessary to manage or prevent cancer progression.[232] There are persistent disparities in 5-year survival rates between Black and white men with prostate cancer.[214] Studies of prostate cancer survivors who are Black report poorer quality of life and physical and mental health, compared to cancer survivors who are white.[232] A 2023 study analyzing prostate cancer 5 year survival, revealed Asian/Pacific Islander (API) men consistently showed the highest prostate cancer survival rates compared to white and other minority groups.[214] Despite decreasing trends in cumulative risk of death across racial groups, American Indian/Alaska Native (AI/AN) and Black patients consistently had the highest rates of death between 1995 and 2019.[233]

It is estimated that 1 in 8 American men will be diagnosed with the disease and about 1 in 44 will die from it.[234] Prostate cancer generally has high survival rates, especially when diagnosed early. Most (68%) prostate cancers in Ohio were diagnosed at a local stage with a five-year relative survival of nearly 100%.[235] Common long-term side effects of prostate cancer treatment include urinary dysfunction, erectile dysfunction, and infertility.[236] Regular check-ups and monitoring are essential to detect any signs of recurrence or new health issues. Prostate cancer survivors may have an increased risk of developing certain other cancers, including bladder cancer, small intestine cancer, thyroid cancer, and melanoma. Those treated with radiation therapy may also have a higher risk of rectal cancer and leukemia.[236]

Prostate cancer has the largest racial disparities of any cancer in the United States. Black men are 1.67 times more likely to be diagnosed with prostate cancer and have a 2.06 times higher risk of dying from the disease compared to white men.[237] Key factors contributing to these disparities include lower screening and a higher frequency of preclinical disease,

more aggressive tumor features (stage and grade) at diagnosis, and lower baseline cancer-specific survival among Black patients. These factors suggest that Black men may benefit from earlier and more frequent screening.[237] Factors such as living in deprived areas, lower education levels, and differences in healthcare utilization significantly impact these disparities.[214]

Lung Cancer

Lung cancer survivorship disparities persist across racial, ethnic, and socioeconomic factors. Survival rates differ significantly by race and ethnicity. Black individuals with lung cancer were 16% less likely to survive five years compared to white individuals.[238] Latino individuals were 9% less likely to survive five years compared to white individuals.[238] Asian individuals or Pacific Islanders were 14% more likely to survive five years compared to white individuals.[238] American Indians/Alaska Natives individuals were equally likely to survive five years compared to white individuals. [238]

Socioeconomic factors play a major role in survivorship disparities. Lower income and education levels were associated with reduced survival rates.[239] Cancer patients with regular physical activity had higher 10-year survival rates compared to those without.[239] Poor health status, serious psychological distress, and smoking were associated with reduced survival rates.[215,239] As many as 80% of lung cancer survivors face psychological distress, a rate that is three times higher compared to survivors of other types of cancer.[240]

END OF LIFE CARE

The last stage of the cancer continuum is end-of-life care, which places an emphasis on improving patient comfort and quality of life through pain management, psychological burden, and medical events. End-of-life care considers patient quality of life preferences in decision making and can include access to palliative care (both medical and radiation therapy) and hospice care.[14,241] Current guidelines advocate for the highest quality of life over intense treatment interventions, which can oftentimes be aggressive, invasive, and expensive. Disparities exist in end-of-life care due to unequal utilization of palliative and hospice services among racial and ethnic minority groups. Additionally, underserved populations are more likely to receive intensive treatment options that are not beneficial during the end-of-life stage.[242] Minority populations, particularly Black, Asian, and Hispanic patients, are more likely to receive aggressive care and have lower rates of hospice enrollment.[242] Cultural, communication, and structural factors, including barriers to palliative care and advanced care planning, contribute to these disparities. Differences in health care access and insurance type further exacerbate these issues.[242]

Specific Cancers

Breast Cancer

End-of-life care for breast cancer patients focuses on comfort, symptom management, and support. Hospice care provides specialized attention for those with six months or less to live, while palliative care relieves symptoms and improves quality of life.[243] Key aspects include managing pain, fatigue, breathlessness, nausea, anxiety, and cognitive changes, as well as offering emotional, spiritual, and practical support.[243] Family support includes counseling and respite care. Advance care planning ensures the patient's end-of-life wishes are respected. There are racial and ethnic disparities in end-of-life care for breast cancer patients. Hospice use is lower among Black patients compared to white patients. Factors contributing to this include spiritual beliefs, cultural systems, and mistrust in the medical system.[243] Studies indicate that Black, Hispanic, and Asian/Pacific Islander women with metastatic breast cancer (MBC) are less likely to receive palliative care than their non-Hispanic white counterparts.[243,244] Black and Hispanic women with metastatic breast cancer who do not receive palliative care have higher in-hospital mortality rates and longer hospital stays compared to white women.[225] Physicians often provide insufficient communication to Black patients about their diagnosis, prognosis, and treatment options, resulting in delayed referrals to hospice or palliative care services.[243]

Colorectal Cancer

Palliative care is an essential component of end-of-life care for colorectal cancer patients. It aims to relieve symptoms, pain, physical stress, and mental stress associated with the diagnosis.[245] Pain is a common symptom in the final stages of colorectal cancer. It may require strong opioid medications for management. Expected symptoms include changes in bowel function, fatigue and weakness, appetite loss, and mental changes (confusion, and withdrawal).[245]

There are disparities in palliative care utilization and hospitalization outcomes among different racial/ethnic groups with colorectal cancer.[246] One study found that Black patients have higher odds of receiving palliative care consultation compared to white patients, while Hispanic patients have lower odds.[246] Black patients are less likely than white patients to utilize hospice care in their final six months of life. Instead, they are more likely to undergo intensive care, including hospitalizations, emergency department visits, and aggressive treatments.[247]

Multiple Myeloma

A cohort study following patients with MM from 2006-2018 found significant disparities in end-of-life care based on race. Black patients were less likely to access hospice care in their final six months of life compared to white patients.[248] Instead, they were more likely to undergo intensive care, including hospitalizations, emergency department visits, and aggressive treatments.[248] Additionally, inadequate communication from physicians to Black patients regarding diagnosis, prognosis, and treatment options contributed to these disparities, often leading to late referrals to hospice or palliative care services.[248] Despite overall improvements in supportive care over time, these racial disparities have persisted. Patients enrolled in a hospice care had reduced odds of experiencing aggressive medical treatments at the end of life.[249] Those who survived more than a year after their diagnosis were more likely to utilize hospice promptly and were less likely to receive intensive medical care near the end of life.[249]

Cervical Cancer

Cervical cancer can cause severe symptoms at the end of life. Uncontrolled bleeding and pain as well as renal failure are common end of life issues that a patient may have to experience. Early referral for hospice support and palliative care is beneficial. Since many patients may have young children, special attention may be needed to provide support for the patient and her family and incorporation of social work is usually helpful. Hispanic cervical cancer patients are less likely to use palliative care compared to non-Hispanic white patients.[250] Non-Hispanic Black patients are less likely to utilize palliative care services compared to white patients.[250] Racial minorities are more likely to receive intensive and invasive end-of-life care, and to be referred to palliative care later with a higher symptom burden.[251]

Prostate Cancer

A study presented at the 2024 ASCO Annual Meeting found that prostate cancer patients discharged to facilities or with home health care were significantly more likely to receive palliative care.[252] However, there are racial disparities observed in palliative care. Black patients with prostate cancer face significant disparities in end-of-life care compared to white patients. They are less likely to receive diagnostic and therapeutic interventions such as laboratory tests, prostate-specific antigen tests, cystourethroscopy, imaging procedures, hormonal therapy, chemotherapy, radiotherapy, and office visits.[253] Conversely, Black patients are more likely to experience high-intensity and aggressive care, including ICU admissions, inpatient admissions, and cardiopulmonary resuscitation.[253] These disparities are observed throughout the last year, three months, and one month of life.[253]

Lung Cancer

Common symptoms in the final stages of lung cancer include pain, shortness of breath, cough, confusion, weakness, and loss of appetite. Hospice and palliative care teams manage these symptoms to improve quality of life.[254,255] Controlling pain is a top priority. This may involve medications, including opioids, as well as other interventions to keep the patient comfortable.[254,255] Minority patients, including Black and Hispanic individuals, are more likely to have increased ICU days, ER visits, and inpatient days compared to non-Hispanic white patients. They are also less likely to use hospice care or be enrolled in hospice in the last three days of life.[256] Patients with very low socioeconomic status (SES) are also less likely to use hospice care or be enrolled in hospice in the last three days of life compared to those with very high SES.[254,257] These disparities result in differences in the quality of end-of-life care, with minority and low-SES patients experiencing more aggressive care and less access to supportive services like hospice and palliative care.[256]

VI. CLINICAL TRIALS

Overview

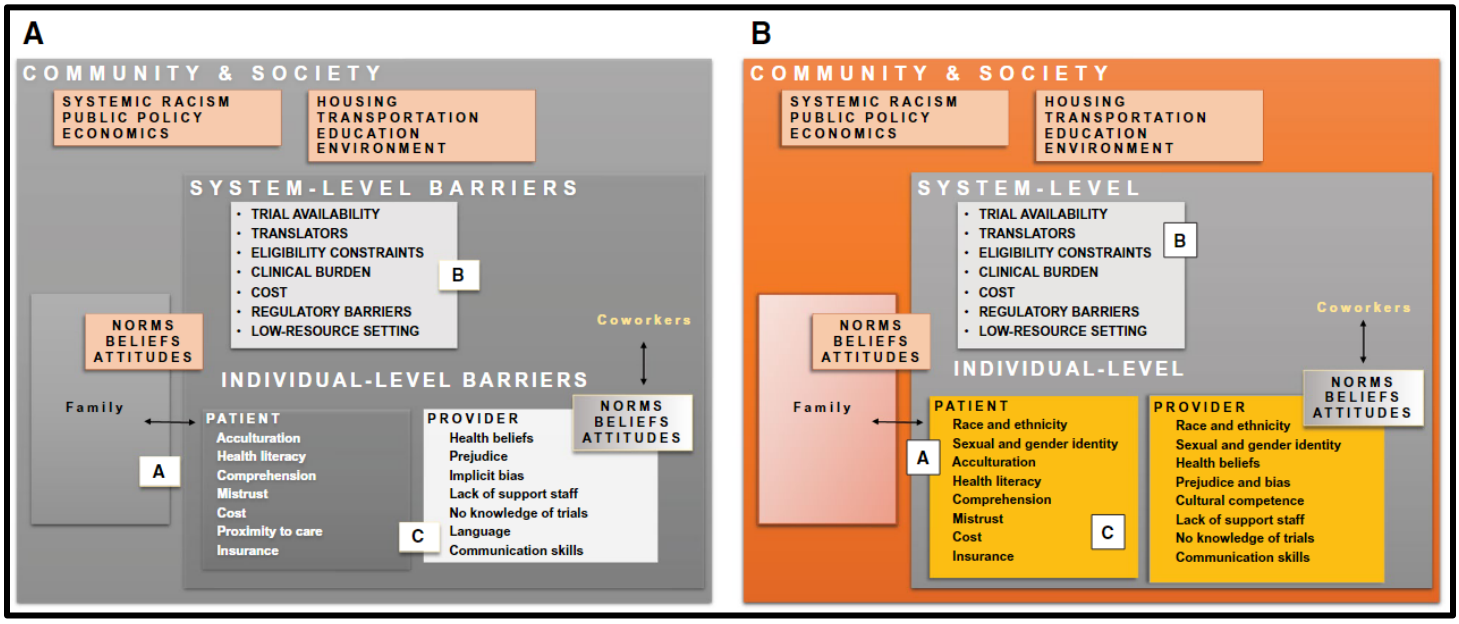
There are significant racial and ethnic disparities in participation in cancer clinical trials. Despite efforts to increase minority participation in cancer clinical trials, the disparities persist and have worsened over the past decade.[258] The National Institutes of Health (NIH) Revitalization Act of 1993 required that members of minority populations be adequately represented in clinical research.[259,260] However the proportion of underrepresented minority patients in phase III cancer treatment and prevention clinical trials has actually decreased from 1990 to 2010[260,261] and the failure of US trials to approximate this standard has sadly not changed since the 20th century. Specifically, the proportion of African-Americans in phase III cancer treatment and prevention trials decreased from 10.5% (1990-2000) to 6.2% (2000-2010), compared to their actual representation in the US population of 11.7% in 1990 and 12.6% in 2010.[261,262]

Less than 20% of adult cancer patients participate in clinical trials, and those who do are predominantly white, middle-class men.[258] A recent study analyzing racial and ethnic inequities in U.S. clinical trial participation from 2017-2022 across 280 cancer clinics found that only 4.4% of Black patients and 4.2% of Hispanic patients participated in oncology clinical trials compared to 6.3% of white patients.[263] Black and Hispanic patients were underrepresented in colorectal, prostate, and lung cancer trials sponsored by the National Cancer Institute from 2000-2019.[264] Lack of diversity in clinical trials limits the generalizability of trial results to minority populations who already experience greater cancer burden.[258,265] Increased diversity in cancer clinical trials is essential to improving patient outcomes.[258]

The FDA now has a "diversity plan" for clinical trials to include more under-represented groups, but trial designs still face issues like health insurance requirements and exclusion criteria for conditions like hypertension, which are more common among minorities.[266] In a study assessing the frequency of race reporting and representation in clinical trials for FDA-approved oncology drugs from 2008 to 2018, it was found that reporting was infrequent, and Black and Hispanic participants were consistently underrepresented relative to their cancer incidence, highlighting the need for greater minority inclusion to ensure equitable healthcare outcomes.[267] Significant barriers to minority participation include lack of trial availability in minority communities, costs associated with trial participation, medical mistrust, lack of opportunities offered to participate in trials by providers, and lack of patient navigators to coordinate and inform patients.[265,267] Studies have suggested barriers to trial enrollment include financial considerations (costs of more frequent health care and tests, time away from work, unknown effects of investigational agent), interpersonal considerations (fear, communication with medical personnel, perceptions about providers and treatment), provider bias (overestimating risk of losing trust from minority patients, underestimating willingness of minority patients to participate, underestimating ability of minority patients to complete trial requirements), and patient bias (overestimating risk of trial participation, concerns about trial ethics and motives).[266]

Several theoretical models have been proposed to address disparities in accrual to clinical trials. Two are especially relevant – Accrual to Clinical Trials (ACT)[268] and the Accrual Enhancement Program (AEP).[269] The ACT model posits that the decision to enroll on a clinical trial is not solely influenced by the patient and provider in the encounter, but that each is influenced by circles of influence of family and peers as well as the general community. Thus, efforts to increase accrual to clinical trials must consider approaches to each level of influence. This model is in parallel to the AEP which then takes into account the process of clinical trial accrual itself (see Figure 13). Is there a trial that the patient is eligible for (level 1)? If eligible, was the patient asked (level 2)? If asked, did the patient agree (level3)? If an audit is done at each level in an institution or even a clinic, areas for improvement or intervention could be implemented – e.g. open new trials for patients there was no trial or implement system wide strategies (e.g. more staffing) on days when patients aren't asked or even implement implicit bias training. These models are currently being tested in a study at the OSUCCC funded by the NCI.

Figure 13. Multilevel interventions to address barriers and improve clinical trial access and enrollment. (A) Collecting sociodemographic data and patient-reported social determinants of health. (B) Bolstering the research infrastructure, expanding access to interpreter services, and addressing logistical barriers in low-resource settings. (C) Understanding how health beliefs, patient comprehension, communication, and perceptions of clinical research influence clinical trial enrollment decisions among diverse populations. At the community level, policy changes and interventions aimed at confronting systemic racism and its numerous sequelae are critical (Kahn et al., 2022).[269]



VII. MEDICAID COVERAGE

The Ohio Department of Medicaid has a comprehensive, empirically driven, and evidence-based cancer screening and prevention program available to all Ohioans eligible and enrolled in Medicaid. Today more than three million individuals covered by the program can take advantage of comprehensive cancer screening and prevention services and supports to reduce their risks of life-changing disease.

Three separate Ohio Administrative Codes (OAC) establish rules Ohio Medicaid must follow and enforce to ensure Medicaid-enrolled credentialed healthcare providers offer beneficiaries the highest quality and safety standards available for comprehensive cancer screening and prevention. They are:

1. Ohio Administrative Code (OAC) Rule 5160-1-16, Preventive Services, which defines procedures, treatments, or other measures which are considered preventive, and outlines payment for these services.
2. Ohio Administrative Code 5160-1-01, Medicaid Medical Necessity, which details the criteria and conditions for ordering cancer screening and prevention interventions for enrollees.
3. Ohio Administrative Code 5160-26-03, Managed care: covered services, which governs rules and criteria for caring for the health and well-being of Ohio Medicaid members under Ohio Medicaid Managed Care plans and the Single Pharmacy Benefit Manager

The OAC rules are scheduled to be reviewed by Ohio Medicaid every 5 years with full transparency to the public-at-large, who provide input to the final rules. This on-going process ensures that the most up-to-date evidence-based information and guidelines are available to healthcare professionals as they provide comprehensive cancer screening and preventive services for Ohio's Medicaid membership.

Broader than the OAC rules, in February of 2023, the Ohio Department of Medicaid implemented the Next Generation managed care program, introducing a person-centered focus on meeting individual healthcare needs in the context of family and community. This Next Generation of managed care emphasizes actively improving population health outcomes through a collective impact model. Ohio Medicaid's managed care plans use structured, clinically proven quality improvement methods and deeper partnerships with community organizations. The new approach to managed care includes an individualized model of care coordination, deeper engagement with members, and more effective harnessing of data to ensure members receive needed treatment and services in a timely manner.

To learn more about Ohio Medicaid's person-centered approach to managed care visit our Next Generation of Ohio Medicaid Managed Care webpage.

VIII. SUCCESSFUL INTERVENTIONS

The Delaware Cancer Consortium[270]

The Delaware Cancer Consortium launched a statewide cancer control program in 2003 focusing on colorectal cancer (CRC) screening and treatment with a focus on reducing disparities among African Americans. By 2004, a CRC nurse navigator system was established, which provided a nurse navigator and care coordinator at each acute care hospital and physician community. They provided over 10,000 navigation encounters and more than 5,000 CRC screenings by 2011. Additionally, the Delaware Cancer Treatment Program covered CRC care costs for 2 years for uninsured individuals (up to 650% of the federal poverty level) and created special outreach programs for African American communities.

By 2009, the interventions implemented by the Delaware Cancer Treatment Program eradicated disparities in CRC screening rates, stage at diagnosis, and incidence rates among African Americans. Among African Americans, CRC screening rates increased from 48% to 74% (same screening rate as white individuals), local-stage diagnoses rose from 16% to 50%, and incidence rates decreased from 67 to 45 per 100,000 population. Mortality rates declined by 42%, nearly matching those of whites due to the reduction in the percent diagnosed at late stage and increased access to treatment.

CRC incidence and mortality cost $14 billion a year in medical expenses and lost years of productivity. Efforts from the Delaware Cancer Treatment Program were shown to be highly cost-effective. The screening program cost $1 million annually ($1.15 per resident) and saved $8.5 million from reduced incidence and earlier diagnosis stages, leading to cheaper treatment regimens.[270]

The Metropolitan Chicago Breast Cancer Task Force (MCBCTF; now called Equal Hope)[271,272]

The Metropolitan Chicago Breast Cancer Task Force (MCBCTF), now called Equal Hope, was founded in 2007 to address the rising breast cancer mortality disparity between non-Hispanic (NH) Black and non-Hispanic (NH) white (women in Chicago. The three main issues addressed by Equal Hope included NH Black women receiving fewer mammograms, the mammograms that were received were of lower quality, and the treatment post-diagnosis was inferior compared to NH white.

To address disparities in screening, Equal Hope deployed nurse navigators to assist with healthcare navigation, launched targeted outreach and education campaigns, and advocated for policy changes to increase screening resources. Further interventions to improve mammography quality included an evaluation and improvement plan of mammography healthcare facilities using 11 quality metrics, increased training for radiologists, and enhanced support for safety net institutions to improve care for financially disadvantaged patients. To better ensure treatment post-diagnosis, Equal Hope improved care coordination to provide continuous care and developed financial assistance programs.

The impact of the interventions by Equal Hope reduced disparities in all of the focus areas. There was a significant decline in NH Black BC mortality annually from 2006-2013. The mortality rate between NH Black and NH white was higher than the national average from 1999–2005 but dropped below the national average from 2006–2013. After Equal Hope began, the mortality disparity decreased by 35% between 2005–2007 and 2008–2010. Excess deaths among NH Black women dropped by 29% from 1995–2005 to 2006-2013, saving 25 lives annually. Finally, facilities that adopted the 11 mammography quality metrics from 2006–2011 showed continuous improvement.[271]

Operation Wipe Out Cervical Cancer (Alabama)[273-277]

Operation Wipe Out Cervical Cancer is an initiative launched in May 2023 aimed to eradicate cervical cancer in Alabama by 2033. An action plan developed through statewide partnerships and evidence-based advocacy from various communities and sectors focused on three primary steps: increasing HPV vaccination, enhancing cervical cancer screening, and ensuring women return to follow-up testing and treatment after screening positive for abnormal cells.

The initiative adopted several innovative strategies to achieve cervical cancer eradication by 2033. Hospitals sent buses to remote rural areas where access to gynecologists is limited to provide screening services. Traveling nurse practitioners began examining women with abnormal screening results at no extra cost, thus reducing financial and travel burdens on patients. Nurse practitioners also visited schools in counties with high cervical cancer rates to vaccinate students as a way to increase accessibility to preventive care.

In collaboration with school districts, Operation Wipe Out offers HPV vaccination administered by registered nurses on school premises. Parents of students aged 9–18 receive mailed consent forms with stamped return envelopes to facilitate vaccination consent. Additionally, the Alabama Department of Public Health supports Operation Wipe Out by providing free HPV vaccinations, free cervical cancer screenings for uninsured women with low income, and follow-up colposcopies when necessary.

Rural Interventions for Screening Effectiveness (RISE)[278]

The Rural Interventions for Screening Effectiveness (RISE) study conducted in Ohio and Indiana evaluated the impact of two interventions aimed at increasing cancer screening adherence among rural women. The interventions included a mailed interactive DVD with tailored messages, or the DVD combined with patient navigation (PN) via phone. The DVD provided personalized information based on a woman's age, family history of cancer, perceived cancer risk, barriers, benefits, and self-efficacy related to screening. The PN intervention offered additional counseling for cancer screening.

Results after 12 months showed that the DVD+PN group had the highest screening adherence rates: 30% for all screenings and 49% for any screening compared to 15% and 29% for the DVD-only group and 10% and 25% for the usual care group. Women in the DVD+PN group were almost six times more likely to be up to date with all screenings than those in usual care and three times more likely than those in the DVD-only group.

The DVD+PN intervention was also more cost-effective at $10,638 per woman up to date compared to $14,462 for the DVD-only group. These costs are modest compared to the average $150,000 cost of cancer treatment for one patient in the US. Overall, the RISE study highlights the importance of patient navigation and suggests that remote interventions can significantly improve cancer screening rates among rural women.

IX. Summary of Recommendations

1. Accessibility

- Expand the capacity of Comprehensive Cancer Centers in Ohio beyond current two.
- Improving Accessibility to new medical advances such as access to CART-Therapy and Immunotherapy.
- Increase insurance coverage for comprehensive biomarker testing. (See House Bill 24 - https://www.legislature.ohio.gov/legislation/135/hb24)
- Expansion of Cancer centers targeted efforts to increase clinical trials out of their networks.
- Incentivize providers to serve high-risk populations that historically have higher mortality and morbidity outcomes.
- Increase the number of minority primary care providers by increasing upstream educational access for the medical fields.
- Partner with schools and universities to establish mentoring pipeline programs, supporting students' transition to college and retaining those interested in healthcare through scholarship funding
- Increase loan repayment and incentives for minorities to serve underserved populations with significant chronic disease disparities.

2. Affordability/ Appropriate Care

- Implement strategies to increase referrals of racial and ethnic patients for surgery and chemotherapy to improve access to appropriate care
- Collect and track data at the hospital level regarding treatment and outcomes based on race to enable comparative analysis for quality improvement
- Increase patient literacy so they are aware of physician's qualifications and capacity to treat their cancer patients.
- Expand access to affordable healthcare through Medicaid Expansion, Subsidized Insurance Programs, and Community Health Clinics
- Ensure individuals affected by cancer have access to comprehensive follow-up care and rehabilitation services while addressing financial hardships to improve long-term health outcomes.
- Support policy efforts to place a cap on out-of-pocket costs.
- Expand resources for individuals with private insurance to assist with copays.
- Close loophole that allows for copy accumulator/copay adjustment programs used by insurance companies. [279]

3. Burden & economic cost

- Expand Access to Affordable Healthcare through Medicaid Expansion, Subsidized Insurance Programs And Community Health Clinics.
- Enhance Cancer Screening Programs by using: Mobile Screening Units, Self-Sampling Kits, and School-Based Vaccination Programs
- Address social determinants of health through transportation aid, housing and food security, workplace policies, community engagement, patient navigation, financial assistance, and mandatory insurance for preventive care.

4. Chronic Disease Management

- Increase patient access to Chronic Disease Self-Management Programs (CDSMP) for racial/ethnic populations.
- Enhance patient/population health literacy and eHealth literacy.
- Increase awareness and use of the Chronic Disease Self-Management Programs (CDSMP) available throughout the state with physicians and medical professionals.
- Increase funding of self-management programs to maintain capacity and incentivize potential partners.
- Conduct a comprehensive community assessment to identify existing CDSMP education programs in the state, identifying gaps and expanding capacity

5. Care Coordination

- Increase Patient Navigation in care plans through enhanced understanding that it is an evidence-based intervention that eliminates disparities across the cancer continuum.
- Provide access to patient navigation upon cancer diagnosis. [280], [281], [282]
- Advocate for the extension of the CMS rule for navigation to be extended to include the screening process and other preventative interventions.
- Increase awareness of economic benefit of using patient navigators
- Advocate for a statewide proclamation for 'Patient Navigation Day'
  Advocate for community health workers (CHWs) in cancer programs by promoting their formal recognition, inclusion in care teams, standardized training and certification, and adequate resource allocation.

6. Clinical Trials

- Strengthen cancer surveillance systems and data collection efforts to monitor cancer incidence, mortality, and disparities across population.
- Expand impact of clinical trials to provide the highest level of evidence in evaluating the safety and efficacy of new cancer therapies.
- Provide transparent process to estimated out-of-pocket cost of participation in clinical trials and provide financial support to cover those costs.[283]
- Advocate for reduction in co-pays and deductibles for clinical trial participants for Medicaid recipients
- Raise awareness of Ohio physicians on the new federal requirements to complete the required attestation statements for Ohio Medicaid recipients of clinical trials.
- Partner with OHA, AMA and NMA to initiate a campaign to set annual goals for clinical trial enrollment within R/E populations
- Provide information and resources to educate minority populations about the benefits of enrolling in cancer treatment clinical trials, including access to cutting-edge treatments and potential health benefits.
- Offer support and guidance to individuals interested in participating in clinical trials
- Partner with cancer centers, research institutions, and advocacy organizations to promote awareness of available clinical trials
- Ensure that all individuals participating in clinical trials receive appropriate care, support, and follow-up throughout the trial process to ensure their safety and well-being.

7. **Community Engagement**
    - Implement comprehensive education programs to raise awareness about cancer prevention and early detection at schools, workplaces, and community centers.
    - Partner with healthcare professionals (various contacts with OAAHC and partner organizations statewide) and institutions (locally such as OSU or Ohio Health) to create community outreach initiatives and workshops focusing on cancer prevention and healthy living.
    - Allocate funds for research on social determinants of health related to cancer to better understand and address the root causes affecting diverse populations.
    - Engaging the media to develop community education campaigns to: Raise awareness of cancer disparities in R/E populations,
    - Increase participation in clinical trials using trusted messengers.
    - Establish accessible cancer screening locations and mobile clinics to ensure early detection, particularly in remote and low-income areas
    - Develop and distribute educational materials that are culturally relevant and available in multiple languages to ensure inclusivity.
    - Create and fund community- based support groups, hotlines, and counseling services for cancer patients and their families. [284], [285], [286], [287], [288], [289], [290]

8. **Cultural Competency/Humility/Implicit Bias (healthcare professionals education)**

    - Incorporate comprehensive cultural competency training into medical and nursing school curricula, with specific modules on minority health issues and cancer disparities.
    - Incorporate implicit bias classes for medical students in the 1st and 4th year
    - Require mandatory training of all health professionals within Hospital systems
    - Develop and mandate continuous cultural competency and cultural humility training programs for all healthcare providers, with a focus on minority health and cancer prevention.
    - Develop and disseminate culturally tailored educational materials and programs to increase awareness and promote cancer prevention and screening among minority populations, and eliminate knowledge gaps and facilitating access to preventive services.

9. **Delay in Diagnosis to Treatment-Addressing Delays in diagnosis**

    - Provide cancer treatment expeditiously to prevent upstaging of disease.
    - Promote timely delivery of cancer care by insurers with national quality indicators around cancer waiting times from diagnosis to treatment within different health systems.
    - Increase funding to expand capacity of safety net facilities to treat the uninsured.
    - Expand changes to Medicare will impact navigation which has historically helped at risk populations obtain cancer screening but also initiate treatment.
    - Implement strategic planning to increase healthcare workforce as shortages across the healthcare enterprise including physicians.
    - Target significant reductions in wait times to initial consultations and delays in initiation of first line treatment.
    - Increase funding for research focused on cancer disparities among minority groups and ensure data collection efforts disaggregate data by specific subgroups.
    - Advocate for policy change to ensure that the donut hole in screening coverage is addressed. Modify insurance coverage so the entire cancer screening process is covered by insurance from the test to the resolution of the test finding.

- Require health systems to monitor and report time to treatment initiation from diagnosis, with guidelines on recommendations and require regular reporting for timeliness in obtaining prior authorization to reduce delays in treatment
- Expand options for care within network to reduce delays in diagnostic resolution and treatment initiation.
- Develop alternative payment structures such as accountable care organizations may reduce fragmentation in care that can cause delays. [291], [292], [293], [294], [295], [296], [297], [298]

10. <u>Disaggregation of data (by R-E-A-L; intentional oversampling)</u>

- Ensure state and local health data systems comply with HHS Data Standards for Race, Ethnicity, Primary Language, and Disability, while adapting to evolving federal reporting requirements for improved data granularity. Support local health departments and other relevant entities in the acquisition and use of geospatial mapping technology to identify and prioritize populations
- Combine data sets from public health (e.g., Vital Statistics), state agencies, and the Ohio Hospital Association to develop near real-time data to plan, monitor and evaluate interventions.
- Require that publicly funded population surveys collect and report disaggregated data on race, ethnicity and primary language.
- Require the collection of disaggregated data to include race, ethnicity and primary language within all state data systems and Medicaid managed care contracts.
- Require funded entities to engage in community-based participatory research approaches with their targeted populations.
- Fund research to perform more granular studies to understand CRC incidence based on race, while accounting for socioeconomic status and regional characteristics.[122], [299], [300]

11. <u>Diversity in Workforce</u>

- Establish and fund state-level programs to promote diversity in the healthcare workforce, specifically targeting cancer care professions such as oncology nursing, oncology social work, radiation oncology, and medical oncology.
- Invest in pipeline programs that engage students from underrepresented minority groups at various stages of their education, from high school through graduate and professional school.
- Forge partnerships with minority-serving institutions, including Historically Black Colleges and Universities (HBCUs), Hispanic-Serving Institutions (HSIs), and Tribal Colleges and Universities (TCUs), to recruit, train, and support diverse talent in cancer care fields.
- Require healthcare organizations to report workforce diversity data to track progress, identify gaps, and inform interventions for equitable cancer care. Provide funding and resources to support underrepresented minority professionals in cancer care fields, including mentorship programs, professional development opportunities, and leadership training.
- Create networking forums and affinity groups to facilitate connections and support among diverse healthcare professionals.
- Offer financial incentives, tax credits, or reimbursement incentives to healthcare organizations that demonstrate progress in promoting workforce diversity and achieving diversity goals.
- Recognize organizations that excel in diversity and inclusion efforts through awards, certifications, or public recognition.
- Implement implicit bias training for medical students in the 1st and 4th year.
- Implement mentoring programs for physicians of color.

- Foster a diverse, inclusive workplace with mentorship, professional development, and support for employees from all backgrounds.
- Partner hospital systems to include implicit bias trainings for health professionals within hospital systems.
- Advocate for policies at all levels to promote diversity, equity, and inclusion in the cancer care workforce, prioritize funding for diversity initiatives, and address systemic barriers to equitable healthcare. Incentivizing physicians of color to locate to Ohio
- Develop recruitment and retention programs with scholarships, mentorship, and support to attract diverse individuals to oncology careers in medicine, nursing, allied health, and research. Provide cultural competency training for cancer care providers, focusing on diverse beliefs, effective communication, and culturally sensitive care strategies. Promote diversity in leadership positions within cancer care organizations, including hospitals, academic institutions, research centers, and professional associations.
- Provide education and training on implicit bias awareness, and inclusive practices to create a more supportive and inclusive work environment for all employees.
- Promote diversity in cancer research, clinical trials, funding, and leadership to improve findings' generalizability and address outcome disparities.

12. <u>Food Access/ Nutrition & Partnerships</u>

- Update guidelines on nutrition for cancer patients.
- Advocate for the availability of fresh fruits and vegetables within racial and ethnic communities.
- Incentivize grocery stores to become part of the solution. Improve the food environment.
- Advocate for Farm bill initiatives to help fund healthier crops and incentivize local grocery food environment.
- Advocate for incentives to donate extra meat, dairy, fruits, and vegetables.
- Strengthen federal nutrition assistance programs like SNAP and WIC by increasing benefits, expanding eligibility, and incorporating nutrition education.
- Develop and deliver culturally relevant nutrition education programs in minority communities through schools, community centers, and healthcare settings.
- Train healthcare providers to offer consistent, culturally sensitive nutrition education as part of routine care, particularly in cancer prevention and survivorship programs.
    - Increase funding for research on the impact of nutrition on cancer risk and outcomes in minority populations

13. <u>Guideline Consensus Agreement</u>

- Require organized cancer screening as crucial to reduce cancer-related mortality, enhance screening participation, decrease disparities, and ensure high quality of services[301];
- Substantial investment needed as it is a resource-intensive public health activity [301]

14. <u>Health Literacy</u>

- Implement education programs and provide resources for healthcare providers and healthcare organizations to assess their health literacy practices. [304]
- Improve strategic planning completed by major health systems and healthcare providers to identify actions needed to be Health Literate Health Care Organizations

- Provide training for health professionals on health literacy communication practices including teach-back, and effective dialogue with patients [305].
- Allocate funding for research on social determinants of health to examine health literacy to improve access to healthcare and reduce healthcare cost.
- Increase education for patients by ensuring detailed after healthcare visit summary, along with easy-to-understand educational materials provided at all healthcare appointments.
- Establish funding for patient navigation to follow-up with patient to check understanding and compliance after healthcare visit.
- Provide easy-to-understand written educational materials on cancer prevention, screening, treatment, and survivorship. [306], [307], [308], [309], [310], [311], [312], [305], [313], [304], [314]

15. <u>Insurance Access/Medicaid Access</u>

- Medicaid and uninsured patients face later cancer diagnoses and worse survival rates due to unequal access to screening, leading to more costly treatments like surgery, chemotherapy, and radiation.
- Require oncology specialty physicians to accept all patients with a diagnosis of cancer if they want to stay as Medicaid/Medicare providers.
- Have a policy like California state which forbids Health Insurance companies to issue policy which will vary from standards of care.

  Insurance contracts with rideshare services can reduce transportation costs. Provide pro bono legal assistance to minority cancer patients for insurance reviews, medical bills, and accessing housing, nutrition, and education benefits.

16. <u>Medical Shortage areas (provider access)</u>

- Fund physician loan repayment programs to recruit primary care providers to underserved areas, addressing shortages and high medical education costs. Healthcare systems need to diversify the workforce, increase efforts to recruit and retain physicians, physician assistants and nurses.
- Physician attrition needs to be addressed and among all fields studied, surgical specialties are at the highest risk. Patient advocacy is needed for funding of safety net facilities, increased access to healthcare facilities in vulnerable communities, support of telehealth/ medicine to bridge gaps in access.[317],[318], [316], [319], [315]Encourage increase in funds available for the establishment and maintenance of training programs for healthcare practitioners.
- Encourage health equity assessments when building new hospitals to assess impact of construction of health disparities and to foster access to new medical services by underserved groups.
- Ease licensing requirements to enable interstate reciprocity in licensure, make licensure more attainable, and provide opportunities for temporary permits as individuals seek full licensure.

17. <u>Medication Access/ Affordability/Step-therapy</u>

- Implement out-of-pocket spending limits: All public and private insurance plans should include limits on out-of-pocket spending to protect patients from excessive costs [320]
- Promote value-based pricing: Develop and implement a widely accepted value framework for cancer drugs to better align prices with their clinical value. This should incorporate factors like clinical outcomes, toxicities, quality of life impact, and costs [320]
- Conduct empirical research: Gather more real-world evidence through pilot studies and experiments to inform evidence-based policies for improving drug affordability without compromising innovation [321]

- Improve price transparency: Implement policies to increase transparency around drug pricing and value to support more informed decision-making [320]
- Explore outcomes-based pricing: Pilot test outcomes-based risk-sharing agreements between payers and drug manufacturers, where payment is linked to patient outcomes [320]
- Reform Medicare prescription drug coverage: Expand Medicare to cover outpatient prescription drugs, including pain medications and other drugs to treat the effects of cancer and its treatment[323]

18. <u>Model Adoption & Piloting</u>

- Programs like Operation Wipe Out Cervical Cancer, the Delaware Cancer Consortium, Equal Hope, and the RISE study exemplify successful efforts to reduce cancer disparities in marginalized populations. Allocate funding to develop teams of traveling women's health care practitioners in rural areas to provide HPV vaccination and cervical cancer screening and follow-up including parental consent coordination (Based on Operation Wipe Out)
- Policy recommendations inspired by the Delaware Cancer Consortium to reduce racial disparities in colorectal cancer in Ohio include funding nurse navigators and care coordinators, establishing treatment programs for underserved populations, providing two years of treatment coverage, and implementing targeted marketing campaigns.
- Policy recommendations based on Equal Hope to reduce racial disparities in breast cancer mortality in Ohio include requiring adoption of 11 quality metrics for mammography facilities, funding additional safety net facilities, and creating financial incentives for radiologists to specialize in mammography.
- Based on results from the RISE study, one policy recommendation to increase cervical, breast, and colorectal cancer screening rates in rural Ohio is to allocate funding to allow for remote education on screening guidelines and assistance in screening completion through patient navigation

19. <u>Prevention focus</u>

- Increase provider awareness of heterogeneity and social susceptibilities in populations and how these factors may contribute to oncological risk.
- Environmental Risk Factors - A.) Occupational exposures - workplace safety guidelines, building contractions materials.[324]; [325], [326], [324]
- Enable oral health care practitioners to act as HPV vaccine administrators
- Dentists play an important role in primary prevention and early signs and symptoms of oral cancers. Currently, Indiana, Kentucky, Louisiana, Mississippi, Oregon, New Jersey, and Massachusetts allow dentists to administer HPV vaccines. We recommend Ohio authorize dentists to administer the HPV vaccination.[327]

20. <u>Quality of Screening</u>

- Use of current, accurate, evidence-based, financially equitable screening and early detection techniques. Use of these screening tests in asymptomatic people (i.e. PSA).
- Element of stigma or misinformation related to screening tests (colonoscopy-discomfort, prep, embarrassment, mammogram-pain, prostate -DRE, PAP - modesty, testicular - invasive removal of a small lesion would be preferable.
- Artificial intelligence, genomic technology, and learning algorithms. References: [328], [329], [330]
- Mobile Screening Units: Implement mobile cancer screening units to reach rural and remote populations, providing accessible and convenient screening services.

- Self-Sampling Kits: Promote the use of self-sampling HPV tests and at-home fecal immunochemical tests (FIT) for colorectal cancer to increase screening rates among populations with limited access to healthcare facilities.
- School-Based Vaccination Programs: Expand school-based HPV vaccination programs to ensure high vaccination rates among adolescents, particularly in low-income and minority communities.

21. School Based Strategies (HPV, Tobacco education)

- Advocate for Ohio's adoption of nationally recognized health education standards as recognized by Centers for Disease Control and Prevention, SHAPE America (Society of Health and Physical Educators) , or the National Consensus for School Health Education as part of Ohio's prescribed curriculum ORC 3313.60.[362,363,364]
- Use culture-centric presentations by minority youth, such as spoken word and digital media, to foster group empowerment for healthier behaviors and cancer prevention.[331]
- Probit the use of predatory tobacco marketing strategies among youth, particularly with the influx of electronic cigarettes, little cigars, and multiple products not labelled as "cigarettes".
- To decrease the incidence of HPV disease further decreasing the incidence of cancer, the panel recommends Ohio legislators modify 3313.671 to add HPV vaccination to the list of required vaccinations for school following the ACIP recommended schedule for vaccination at age 11 or 12.[365]
- Require schools to implement a health education curriculum that complies with Ohio law (ORC 3313.60) emphasizing the harmful effects of the use of tobacco and electronic smoking devices and provides a good base knowledge of the nutritive value of foods.
- Implement school policies on alternative to suspension for students caught smoking providing targeted education to encourage cessation. [332]
- Establish sustainable funding streams for school-based health centers and other innovative models of school-based health care delivery [333]
- Support the expansion of the Medicaid In Schools program to allow any Medicaid-eligible student to qualify for the receipt of medically necessary healthcare services. [335]
- Encourage medical providers to create a culture of immunization in pediatric and family practice offices
- Expand the implementation of the medical legal partnership model within school-based health care settings.
- Incentivize the development of school transportation plans among stakeholders to increase utilization of school-based health centers further increasing access to vaccinations.
- Partner with districts and universities to establish pipeline programs that mentor students and support transition.
- Implement universal social drivers of health screenings in school-based health centers to identify the underlying social drivers of health impacting the health of patients.
- Expand wrap around services in schools that are grounded in Ohio's Whole Child framework, expanding the focus beyond academics to meet the social-emotional, physical and safety needs of students. [366]
- Implement universal screenings in school-based health care settings for tobacco, nicotine, alcohol and other substance use and refer students screened positive to cessation resources.
- Expand the number of community health workers working in school-based health care settings to provide support services that address the underlying social drivers impacting the health of patients.[336]

22. <u>Social Determinants of Health Barriers</u>

- Strengthen early childhood education quality and access and family support programs including paid family leave and reduce barriers to career-technical education and other postsecondary education programs.
- Increase availability of rental assistance, reduce structural barriers to affordable housing, increase affordable housing supply.
- Improve Medicaid Non-Emergency Medical Transportation).[337]
- Improve and expand local public transportation and affordable parking options for patients. Physical/build environment: a.) Radon mitigation programs [338] b.) Electric vehicle initiatives [339] c.) Financial incentives and regulations to transition from combustion engine to all-electric vehicles [339] d.) Increase the presence and accessibility of green spaces, prioritizing areas that have historically lacked access.
- Expand Medicaid eligibility and subsidies for health insurance premiums to reduce financial barriers to care.
- Target underserved populations and communities with high cancer burden and low screening rates.
- Implement policies to address socioeconomic disparities that contribute to cancer inequities, such as raising the minimum wage, expanding access to affordable housing, and providing financial assistance for low-income individuals to cover out-of-pocket costs.
- Develop and implement culturally tailored health education programs and materials to improve health literacy and promote cancer prevention behaviors among diverse populations.
- Provide information about the importance of early detection, healthy lifestyle choices, and available resources for cancer prevention and control.
- Strengthen occupational health and safety regulations to reduce exposure to carcinogens and hazardous substances in the workplace.
- Implement environmental policies to reduce air and water pollution, mitigate environmental risks, and promote healthy living environments in communities.
- Conduct health equity impact assessments of proposed policies and programs to identify potential impacts on vulnerable populations and mitigate unintended consequences.
- Advocate for policies that ensure equitable healthcare access and address structural racism within the healthcare system.
- Foster collaboration among healthcare stakeholders to address social determinants of health barriers comprehensively.
- Develop cross-sectoral initiatives and partnerships to leverage resources, expertise, and collective action for cancer prevention and control.
- Mobilize advocacy efforts to raise awareness of the social determinants of health and advocate for policy change at the local, state, and national levels. Engage stakeholders, policymakers, and community members in advocacy campaigns to prioritize health equity and address systemic barriers to cancer prevention and control. [340], [5], [6]

23. <u>Surveillance (Registry access)</u>

- Develop and maintain a database to track screening information, preventative healthcare such as vaccine uptake, and other public health initiatives.
- Encourage hospital and healthcare provider participation in case reporting and reporting of applicable health information.
- Advocate for the creation of systems to track specifically stated desired outcomes of public health programs for continuous assessment of public health initiatives.
- Ensure continuous security of personal health data by requiring adherence to the United States Department of Health and Human Services (HHS) Data Standards.

- Require the collection of data to include demographic data such as race and ethnicity.
- Encourage the use of geographic information systems in concert with patient health registries to identify regional differences in cancer incidence and exposures to better understand the impact of geographic location and public systems on minority cancer cases.
- Encourage the tracking of local and state-wide public health initiatives to better assess their impact. Encourage the assessment of patient experience in any cancer surveillance system to better understand community-member perspectives.
- Require funded public health programs to participate in applicable public health databases.
- Ensure the ability to track cancer cases and identify state-wide trends in epidemiological data. Improve efficacy of statewide public health spending. Provide a repository of data for research on exposure risks and continuous assessment of public health initiatives.
- Identification of at-risk or high-risk communities that may benefit from increased public health spending. Make health data available to health institutions across the state for uninterrupted patient care.

  Keep a repository of patient records for individual tracking of exposures, preventative care. Use data repository for future research to prevent future cases and better treat future cases of cancer. [341], [342], [343], [344], [345], [346], [347]

24. <u>Tobacco Tax & Subsidy</u>

- Establish Ohio's Tobacco Retailer Licensing Program within the Department of Commerce to create a centralized repository of statewide tobacco retailers.
- Regulate community access to tobacco and increase funds for anti-cancer initiatives
- Decrease the burden on local health departments, access to tobacco products, and risk of prohibited sales (minors).[348], [349]
- Levy city, state, and federal taxes on products containing nicotine and index them to inflation.[350], [349]
- Advocate for equivalent taxation of nicotine containing products, such as electronic nicotine delivery systems and other not-yet-envisioned forms of nicotine delivery.
- Remove any potential tax-difference on nicotine containing products thus removing an incentive to buy because the tax is less.
- Decrease availability of all nicotine-containing products, including those appealing to minors.[351], [352]
- Advocate for decreased cost of nicotine replacement therapy, including over-the-counter therapy, through removal of sales tax or availability of healthcare or health insurance funds to cover payment.
- Remove policy barriers to nicotine dependence treatment
- Remove cost barriers so individuals can treat their nicotine dependence without a prescription.[353], [354]
- Encourage community involvement in regulation of nicotine sales.
- Decrease reliance on state-systems and encourage community involvement in tobacco regulation.
- Give communities the opportunity to tax and keep revenue in communities that have the greatest burden of tobacco sales/use.
- Encourage individual investment in their own community.[354]
- Establish state-level tobacco retailer licensing.
- Increase the tobacco tax by at least $1.00, establish parity for other tobacco products like e-cigarettes/vapes, and provide funding for public health enforcement of Tobacco 21 laws.

25. <u>Treatment-related (uptake of new testing, etc.)</u>

- Increase funding to understand underlying causes of treatment-related disparities

- Policy changes that support equitable access to all healthcare services such as specialized surgery, systemic therapeutic options, and clinical trial enrollment in underserved areas
- Payment for treatment services for those without insurance including coverage of co-pays
- Ensure treatment guidelines are followed for all individuals, especially for racial and ethnic minorities
- Mandate CME certification on treatment guidelines for treating providers every 3 years
- Employ patient navigators to all hospitals to assist patients through the cancer care journey – form diagnosis through survivorship. Use CMS rule for reimbursement.
- Implement education programs in underserved areas to raise awareness on the benefits and understanding of timely treatment, treatment options, and financial support. [355], [19], [356][356]

26. <u>Use of Technology</u>

- COVID pandemic highlighted disparities in use of Telehealth services related to Limited English Proficiency and need to prepare for future public health crises.
- Identify barriers to access trained medical interpreters for Limited English Proficiency patients during Telehealth visits.
- Dialogue with state-wide medical providers (Community-based, public/private, academic, etc.) to catalogue best practices which can be shared across the state.
- Develop training materials working alongside Community organizations to prepare LEP patients/family members to implement language interpretation in Telehealth visits. [357], [358], [359], [360], [361]

X. CALL TO ACTION

Cancer remains one of the leading causes of death in the United States, and Ohio is no exception. Yet, the burden of cancer is not evenly distributed across populations. Minority groups, particularly Black Ohioans, continue to face disproportionately high cancer incidence and mortality rates, reflecting deeply entrenched systemic inequities. These disparities, rooted in social, economic, and environmental factors, represent not only a public health crisis but also a moral and economic imperative that Ohio must address. Every life lost to preventable cancer is a life filled with potential cut short—a stark reminder of the urgency to act.

This white paper highlights the complex interplay of factors contributing to cancer disparities, from unequal access to healthcare, systemic healthcare disparities, the impacts of structural racism to gaps in prevention, screening, and treatment. Despite advancements in medical technologies and therapies, health disparities and inequities in care across populations groups continue to exist. Far too many Ohioans are still waiting. The human toll of cancer, compounded by the economic costs, demands bold, coordinated action to dismantle these barriers, eliminate disparities which can result in healthier, more economically stable Ohio.

To achieve this, Ohio must embrace a comprehensive, multi-sector approach that addresses the root causes of cancer disparities while strengthening community resilience and access to care. This requires an unwavering commitment from policymakers, healthcare providers, community organizations, and individuals to ensure that everyone—regardless of race, income, or zip code—has a fair and just opportunity to live a healthy life.

Central to this effort is the need for targeted policy and funding commitments. Programs that focus on cancer prevention and early detection, particularly in underserved communities, must be prioritized and sustained. Policies that address the social determinants of health—such as poverty, food insecurity, and housing instability—are essential to reducing the systemic barriers that exacerbate disparities. Ohio must

also tackle the structural inequities within its healthcare system, ensuring that every resident has access to affordable, high-quality care.

Community engagement is another critical pillar of this effort. Local organizations, faith-based groups, and schools play an essential role in empowering individuals with knowledge about cancer prevention and treatment. By fostering partnerships at the community level, Ohio can ensure that information about risk factors, screening options, and healthy lifestyle choices reaches those who need it most. Individuals, too, must be equipped with the tools and confidence to take control of their health, supported by a system that makes these choices accessible and achievable.

Equally important is the need to build a healthcare workforce that reflects the diversity of Ohio's communities. Healthcare providers must be equipped not only with clinical expertise but also with the cultural competence to address the unique needs of diverse populations. By diversifying the workforce and training professionals to recognize and mitigate implicit biases, Ohio can create a more inclusive and equitable system of care.

Access to care is another key focus area. Cancer screening and treatment must be affordable, timely, and geographically accessible, especially in rural and underserved areas. Participation in clinical trials and research must be inclusive, ensuring that advancements in treatment benefit all populations equitably. Data will be an invaluable tool in this process, guiding interventions and measuring progress toward eliminating disparities.

Collaboration will be the driving force behind these efforts. No single entity can solve this challenge alone. Policymakers, healthcare providers, academic institutions, businesses, and community leaders must come together to develop innovative solutions that address cancer disparities at every level—upstream, midstream, and downstream. Together, they can create a unified strategy that leverages resources, expertise, and influence to achieve meaningful change.

The vision is clear: an Ohio where cancer outcomes are no longer determined by race, income, or geography. Achieving this vision will require courage, commitment, and collective action. It means moving beyond acknowledging disparities to addressing their root causes with actionable strategies that drive systemic change.

According to the Health Policy Institute of Ohio, Ohio can grow its economy and preserve public resources by ensuring that every person has the opportunity to live a healthy life and fully participate in the state's economy. When people are healthy and financially stable, their families, businesses and local communities benefit.

However, the 2023 Health Value Dashboard shows that Ohioans face worse health outcomes, including living shorter and less healthy lives, than people in most other states. This results in disparities, or systematic differences in outcomes, experienced across groups of Ohioans. Beyond the substantial impacts on people and communities of color across Ohio, disparities in outcomes, such as life expectancy and overall health status, represent missed economic opportunities for Ohio businesses, governments and communities. Eliminating disparities experienced by Black and Hispanic/Latino Ohioans can increase the state's health, well-being and economic vitality. Ohio stands to gain an estimated $79 billion in annual economic output by 2050 by providing fair environments and opportunities to every resident

Allowing these disparities to continue to exist will only result in a more economically unstable and unhealthy Ohio. By eliminating racial disparities, leaders in Ohio can grow the workforce, increase consumer spending, strengthen communities and reduce fiscal pressures on state and local budgets.

The time to act is now. Ohio has the opportunity to lead the nation in advancing health equity and transforming cancer care. By working together, we can ensure that every Ohioan, regardless of background, has an equal chance to survive and thrive. This is not just a call to action; it is a call to hope—a promise to future generations that we will build a healthier, more equitable Ohio. Let us honor this promise with urgency, determination, and unwavering resolve.

XI. Medical Expert Panel Members and Organizational Listing

Expert's Name	MEP Expert's Affiliation/Organization/ Practice
Electra Paskett, Ph.D – Chair	Division of Cancer Prevention and Control, Department of Internal Medicine, College of Medicine, The Ohio State University, Columbus, OH
Charles Modlin, MD – Co-Chair	Cleveland Heights Medical Center, Cleveland Heights, OH, Case Western Reserve University School of Medicine
Williams Hicks, MD – Co-Chair	Retired Oncologist
Theodoros N. Teknos, MD – Co-Chair	Seidman Cancer Center, University Hospitals Cleveland Medical Center, Case Comprehensive Cancer Center, Case Western Reserve University School of Medicine, Cleveland, OH
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