Coalición para el Control de Cáncer de Puerto Rico

PROGRAMA DE CONTROL COMPRENSIVO DE CÁNCER

Autorizado por la Oficina del Contralor Electoral OCE-SA-2023-01196

PUERTO RICO COMPREHENSIVE CANCER CONTROL PLAN

2025-2030

Prevention • Screening and Early Detection • Treatment
Survivorship and Quality of Life • Infection-related Cancers
Social Determinants of Health • Environmental and
Ocupational Exposure

Preface

This publication was prepared by the Puerto Rico Comprehensive Cancer Control Program, under the University of Puerto Rico Comprehensive Cancer Center (www.cccupr.org) and the Puerto Rico Cancer Control Coalition (https://www.facebook.com/controldecancerpr) in collaboration with multiple stakeholders from different disciplines, agencies, and organizations to translate knowledge into action.

This publication was supported by Cooperative Agreement No. 5NU58DP007164 from the Centers for Disease Control and Prevention (CDC). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the CDC or the US Department of Health and Human Services.

Suggested citation:

Puerto Rico Comprehensive Cancer Control Plan: 2025 - 2030. Puerto Rico Cancer Control Coalition and Puerto Rico Comprehensive Cancer Control Program. San Juan, Puerto Rico, November 2024.

Copyright information:

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Dedication

GUILLERMO TORTOLERO-LUNA, MD, PhD
1953 – 2024

In the loving memory of Dr. Tortolero-Luna, who was the Principal Investigator of the Puerto Rico Comprehensive Cancer Control Program and Director of the Division Cancer Control and Population Sciences at the University of Puerto Rico Comprehensive Cancer Center from 2012 to 2024.

A tribute to Dr. Guillermo Tortolero-Luna written by Dr. Ana P. Ortiz, PhD from the UPR Comprehensive Cancer Center was published in HPV World: The newsletter on HPV and can be found at https://www.hpvworld.com/tribute-to-guillermo-tortolero-luna

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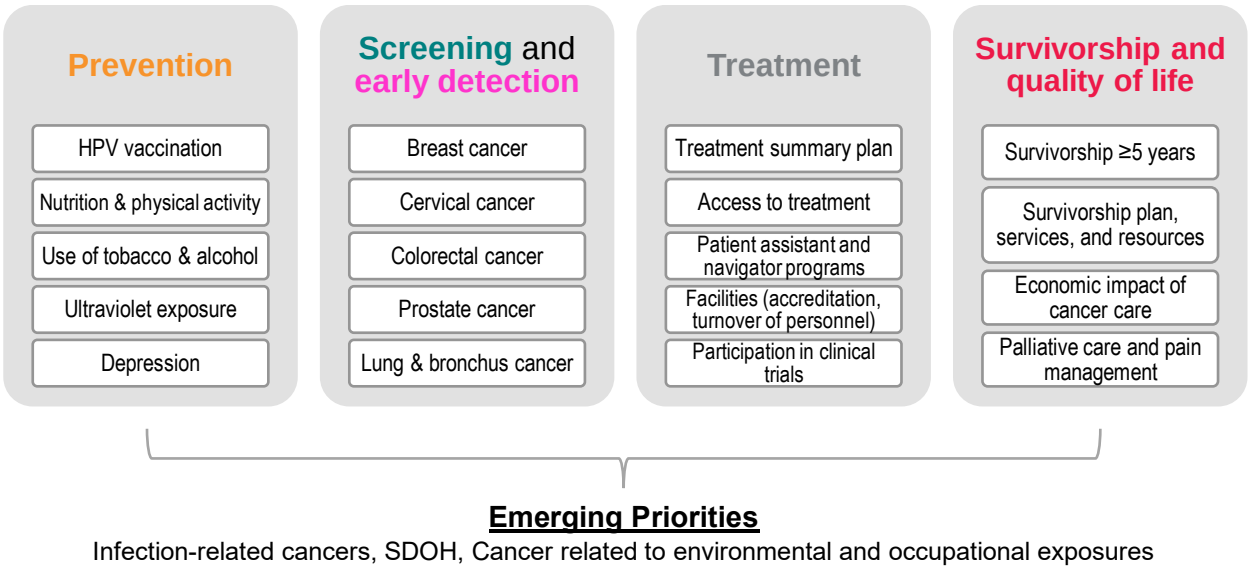
EXECUTIVE SUMMARY

For the last 15 years, cancer control plans have served to guide the cancer control and prevention efforts in Puerto Rico, leading to a drop in the cause of death due to cancer from the 1st to the 2nd position. Even through the progress made, additional efforts are needed to reduce the overall cancer incidence and address emerging priorities. This document presents the 3rd edition of the Puerto Rico Cancer Control Plan (**PRCCC Plan 2025 – 2030**) and aims to provide guidance and tools for individuals and organizations committed with this cause.

The PRCCC Plan 2025 – 2030 is divided into five parts. *Part I: Introduction* contains some key terms and background information of organizations involved in the development of the Plan as well as recommendations of how this plan can be used for the health and wellbeing benefits of the population and communities. *Part II: Cancer Burden in Puerto Rico* describes the current state of cancer in Puerto Rico in terms of incidence and mortality for overall cancers but also by sex, cancer site, and geographic region. Areas with improvements, little or no change or worsening, are highlighted. *Part III: Implementation of the Puerto Rico Comprehensive Cancer Control Plan* is organized in four priority areas across the cancer continuum as shown below. For each one, goals, objectives, and strategies were established. While not every cancer is specifically addressed in this Plan, it focuses on the types of cancer that mostly affect our geographic area. *Part IV: Emerging Priorities* shows additional goals, objectives, and strategies to address important crossing issues affecting our population, such as infection-related cancers, social determinants of health (SDOH), and cancers related to environmental and occupational exposures. Finally, *Part V: Surveillance and Evaluation* provides ways to track and measure progress, outcomes, and impact of the Plan.

PRCCC Plan 2025 – 2030: Priority areas



PART I: Introduction

Comprehensive Cancer Control

- Risk Reduction
- Early Detection
- Improved Treatment
- Enhanced Survivorship

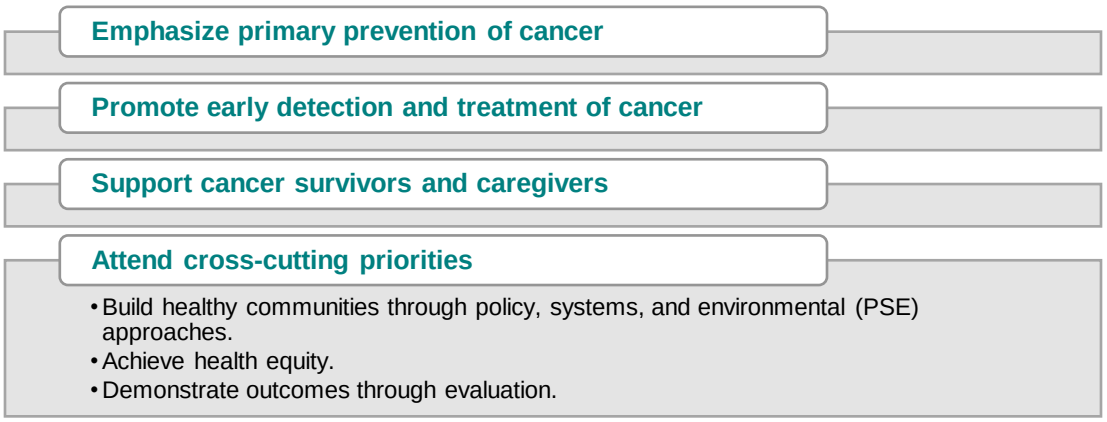
According to the Centers for Disease Control and Prevention (CDC) and the World Health Organization, an appropriate and effective cancer control should be comprehensive and address the specific needs of the population and subgroups at risk in a defined geographic area.[1,2] Thus, **Comprehensive Cancer Control** can be defined as "a collaborative process through which a community pools resources to reduce the burden of cancer that results in risk reduction, early detection, better treatment, and enhanced survivorship".[1] Some basic principles that must be part of it are:[3]

Leadership	Involvement of stakeholders	Creation of partnerships	Responsive to the needs of people
Decision-making based on evidence	Systemic approach (integration of all available programs)	Seeking continuous improvement	Stepwise approach (taking in count local considerations and needs)

Additionally, a comprehensive approach for cancer control ***reduces duplication of efforts, maximizes the allocation of resources, enables changes in systems and policies, enables implementation of multi-level interventions, and identifies gaps and priorities impacting the cancer burden***.[4]

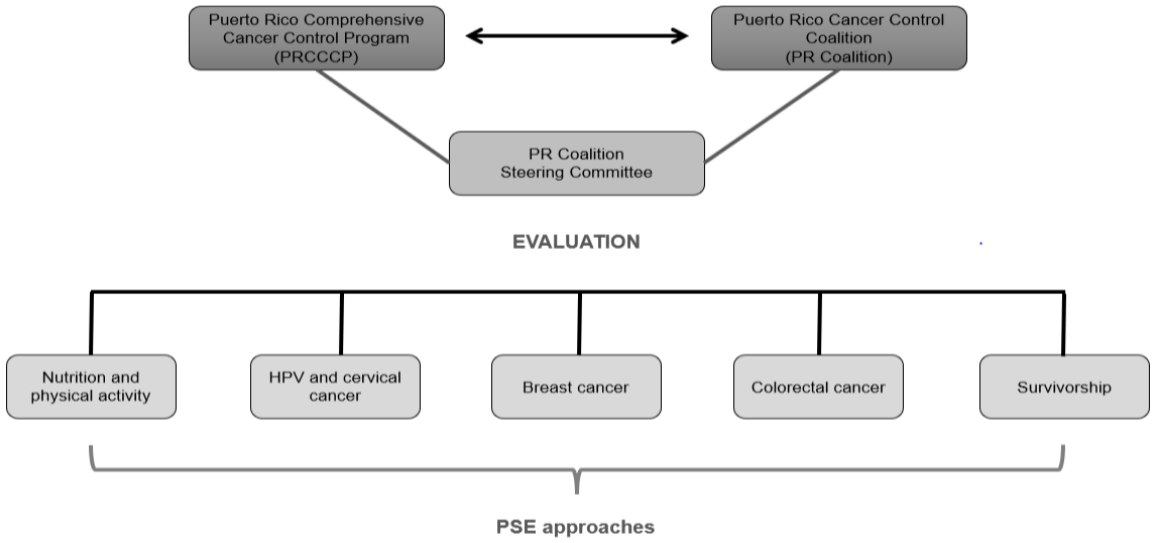
Puerto Rico Comprehensive Cancer Control Program

The Puerto Rico Comprehensive Cancer Control Program (PRCCCP), under the Division Cancer Control and Population Sciences of the University of Puerto Rico Comprehensive Cancer Center (UPRCCC), receives funds from the CDC's National Comprehensive Cancer Control Program (NCCCP) since 2007 to develop, review, implement, and evaluate cancer control plans, among other responsibilities.[1,4] The following CDC's priorities are recommended for including in the plans elaborated by the different jurisdictions:[1]



In addition, as stated in the Law No. 49, "to establish the Public Policy of the Government of Puerto Rico for Comprehensive Cancer Control",[5] the UPRCCC, through the PRCCCP, will act as the Bona Fide agent of the Puerto Rico Department of Health (PRDOH) to lead and collaborate in all government efforts for cancer control and any other efforts to reduce the cancer burden in Puerto Rico. The PRCCCP also works in close collaboration with members from the Puerto Rico Cancer Control Coalition and other stakeholders.

PRCCCP organizational scheme



Puerto Rico Cancer Control Coalition

Another important actor is the Puerto Rico Cancer Control Coalition. Established since 2008, the Coalition is composed by over 25 organizations as well as community leaders and members from public and private sectors that have joined efforts to reduce the cancer burden in Puerto Rico.[6] The Puerto Rico Cancer Control Coalition works in collaboration with the PRCCCP and other organizations to oversee the planning, development, and implementation efforts of the PRCCC Plan are appropriately deployed to achieve the goals and objectives established. Additionally, it is part of the Comprehensive Cancer Control National Partnership, a collaborative group of diverse national organizations that support cancer control coalitions by providing technical assistance and training.[7]

Puerto Rico Cancer Control Coalition: Mission and vision statements[8]

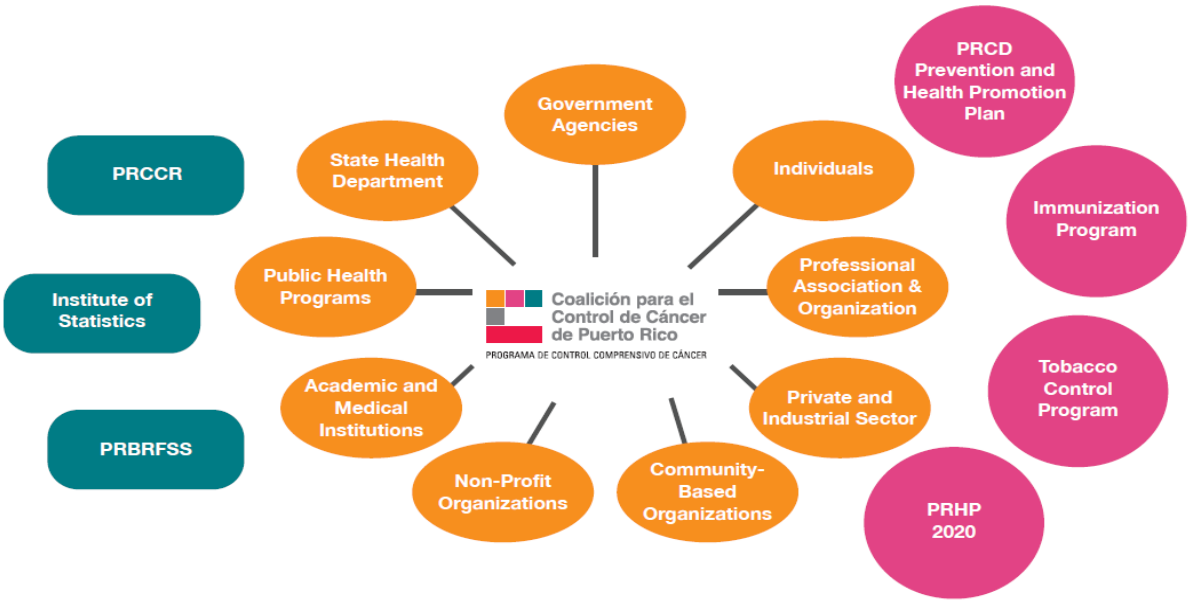
MISSION

- *Reduce the cancer incidence and mortality in Puerto Rico as well as the economic impact associated through the implementation of the PRCCC Plan.*

VISION

- *Improve the quality of life of all Puerto Ricans through the active collaboration of various organizations and individuals interested in promoting evidence-based strategies for prevention, early detection, access to health services, treatment, rehabilitation, palliative care and cancer research.*

Puerto Rico Cancer Control Coalition organizational scheme



Puerto Rico Comprehensive Cancer Control (PRCCC) Plan

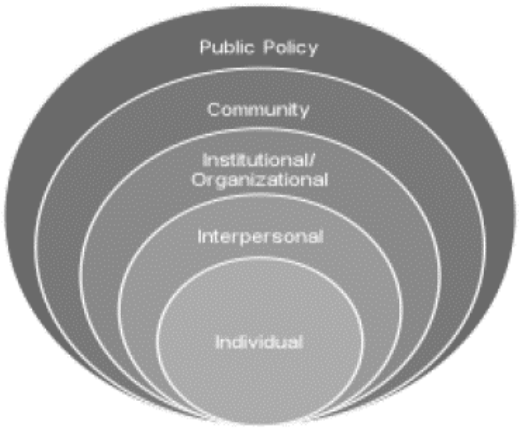
The **Puerto Rico Comprehensive Cancer Control Plan (PRCCC Plan) 2025 to 2030** represents the 3rd edition of the Plan, which aims to continue addressing the burden of cancer in Puerto Rico by providing an outline of what can and should be done to achieve cancer control based on ***four priority areas within the continuum of cancer control***, a widely used framework developed in the mid-1970s by the National Cancer Institute***: 1) prevention, 2) screening and early detection, 3) treatment, and 4) quality of life***.[9] These priority areas of action are the same that were proposed in the 2nd edition of the PRCCC Plan[4] but were revised and updated, taking

in account the current cancer burden in Puerto Rico, cross-cutting priorities, factors associated with an increased risk for cancer, availability of adequate baseline data, track progress and evaluate outcomes, availability of evidence-based interventions (EBIs), feasibility for implementing policies and their potential for meaningful short-, mid-, and long-term impact. For each priority area, goals, measurable objectives, and strategies were set. In addition, the latest data available for the selected performance measures were compared with the baseline data from the 2nd edition of the Plan to evaluate improvement, little or no change, or worsening. This Plan also continues using as a reference the Social-Ecological Model, which states that individual, interpersonal, organizational, community, and public policy factors can have a direct or indirect influence on lifestyles, behavior choices, and health of the population and should be considered for a comprehensive cancer control and prevention.[10]

Cancer Control Continuum

Adapted from: National Cancer Institute. Cancer Control Continuum. 2020. Division of Cancer Control & Population Sciences.

Social-Ecological model framework



Adapted from: McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. Health Educ Q. 1988 Dec;15(4):351-377. pp. 355.

This new edition of the PRCCC Plan (2025 – 2030) is based on the guidelines and parameters established in the Cancer Plan Self-Assessment Tool from the Centers for Disease Control and Prevention,[11] the National Cancer Plan from the President's Cancer Panel, developed by the National Institutes of Health's (NIH) National Cancer Institute (NCI)[12] and the recognition that the scientific understanding of cancer and its care are constantly evolving. As part of the data collection needed to update the Plan, reports from the Puerto Rico Central Cancer Registry (PRCCR), the Puerto Rico Behavioral Risk Factor Surveillance System (PR-BRFSS), and other local and national agencies were requested or downloaded, and literature reviews per priority area were made.

A draft of the PRCCC Plan 2025 – 2030 was developed by an external consultant and submitted to the PRCCCP in 2024. Members of the Puerto Rico Cancer Control Coalition, organized in seven (7) working groups (prevention, screening, early detection, treatment, survivorship, infection-related cancers, social determinants of health, and environmental health) had the opportunity to review it and provide feedback and recommendations. Additional follow-up meetings were conducted with PRCCCP personnel and the members of each working group. This 5-year Plan is the result of the commitment and involvement of subject matter experts, partners, and stakeholders across the Puerto Rico archipelago and is intended to serve as a blueprint for action that can be used by a broad audience (i.e., public health practitioners, advocates, educators, medical providers).

Puerto Rico Cancer Control Coalition, Steering Committee Members

Who can Implement the PRCCC Plan?

The PRCCCP will oversee the development, dissemination, implementation, and evaluation of the **PRCCC Plan 2025 – 2030** in collaboration with the Puerto Rico Cancer Control Coalition and other stakeholders, recognizing that this is a collaborative effort that needs from valuable partners in diverse settings to be successful. The following is the proposed roadmap of the **PRCCC Plan 2025 – 2030**:

Development, revision, and approval PRCCC Plan 2025-2030.

Dissemination to stakeholders and the general population using diverse formats (e.g., press release, email, webpages, social media, bolletin boards).

Allow stakeholders to revise the content and establish priorities for implementation at their sites (i.e., facilities, institutions, organizations) that may vary according to the needs of the populations served.

Deliver periodic meetings with stakeholders organized by the PR Coalition and/or the PRCCCP to assess the progress of the Plan and barriers identified to overcome them.

Perform evaluations (formative, process, outcomes).

Who can assist in reaching the goals proposed in the PRCCC Plan?

Individuals

- Get preventive cancer vaccines [i.e., human papillomavirus (HPV)].
- Keep a healthy weight, increase eating of fruits and vegetables, and physical activity.
- Avoid the use of tobacco products and reduce alcohol use.
- Avoid unprotected sun exposure and artificial tanning.
- Keep educated about cancer prevention and get regular screening.
- Participate or promote participation of others in clinical trials.
- Advocate for legislation and/or policies that promote a comprehensive cancer prevention and control, including insurance coverage for cancer.

Hospitals and other clinical facilities

- Educate individuals about cancer prevention, screening, treatment, participation in clinical trials, survivorship, and palliative care.
- Acquire or maintain the American College of Surgeons accreditation.
- Submit timely complete cancer case reports to the Puerto Rico Cancer Central Registry.
- Ensure all individuals are properly screened, asked about tobacco use, provided with options for quitting, and received evidence-based treatment and a written follow-up care plan.
- Provide cancer patients with a written summary of their care plan.
- Ensure timely and appropriate services for cancer patients including those who are under- or uninsured.
- Establish and promote staff participation in multidisciplinary tumor boards.
- Standardize data collection, including social determinants of health (SDoH).
- Support patient navigation and survivorship programs.
- Leverage technology (e.g., robotic surgery, telehealth).
- Sponsor or co-sponsor screening and testing at communities.

Physicians and other healthcare providers

- Ensure patients are screened for cancer according to the guidelines.
- Promote having a healthy diet, a healthy weight, and exercise regularly.
- Implement a cancer screening reminder system.
- Provide appropriate and relevant information, counseling, and referrals for cancer screening tests.
- Provide cancer patients with a written summary of their care plan.
- Refer patients and encourage patients to enroll in cancer clinical trials.
- Refer patients to community survivorship resources and palliative care.
- Submit complete cancer case reports in a timely manner to the Puerto Rico Cancer Central Registry.
- Ensure that all patients, including those under- or uninsured, have access to care.
- Participate in tumor boards and continued education activities.

Community, faith-based and professional organizations

- Support cancer awareness activities, health services fairs and initiatives for cancer prevention and control across the lifespan.
- Establish healthy vending/cafeteria policies and other wellness efforts.
- Provide cancer information and resources to participants.
- Promote cancer screening among participants.
- Educate members on the importance of participate in clinical trials.
- Participate in and deliver educational training activities.
- Advocate for legislation and/or policies on cancer prevention and control.

Employers

- Establish health and wellness programs/initiatives (e.g., healthy vending policies, cancer coverage in the health insurance package, UV protecting gear, wellness centers).
- Sponsor or co-sponsor health fairs/ screening activities.
- Provide employees with paid leave for clinical preventive service appointments, such as breast, cervical, and colorectal cancer screening.

Schools and universities

- Develop educational campaigns, including stress management.
- Sponsor or co-sponsor training activities and health fairs.
- Collaborate with health providers and external organizations for more accessible screening tests.

PART II: Cancer Burden in Puerto Rico

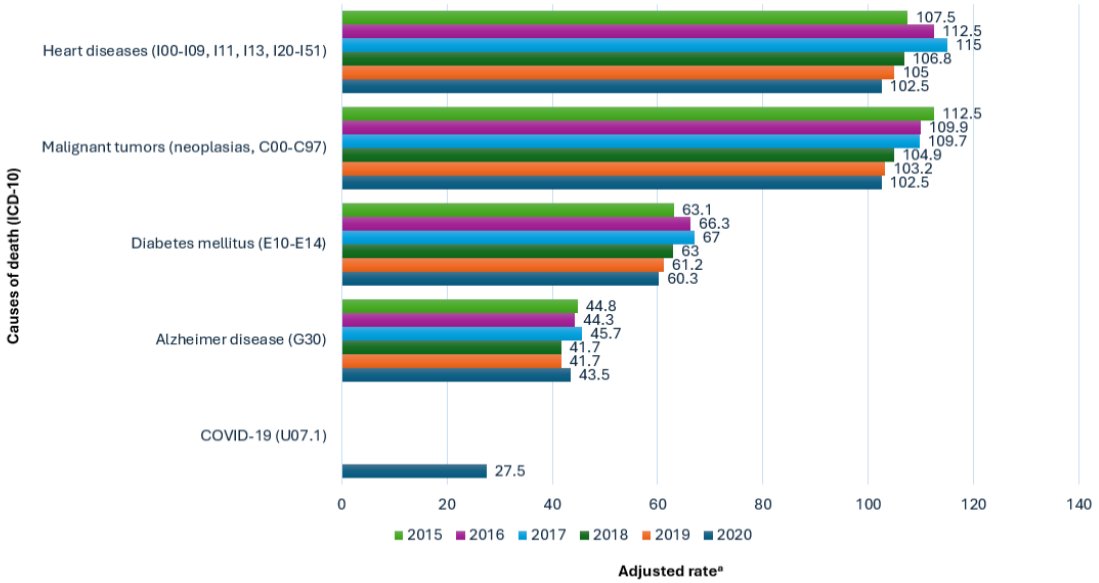
According to the U.S. Census Bureau, the population in Puerto Rico for 2020 was estimated at 3,285,874 inhabitants of which 98.9% considered themselves as Hispanic.[13] The reported median age of 44.7 years was higher than the median age in United States (39.0 years). Almost a quarter (23.5%) of the population in Puerto Rico were 65 years old and over. A report from the PRDOH stated that the population has continued aging with severe implications, including that the first four causes of dead in 2020 were due to chronic diseases and the mortality within the age group of 65 years old and over was almost 8 out of 10.[14]

Until 2015, cancer (malignant neoplasms, C00-C97) was the leading cause of death in Puerto Rico and then dropped to the second cause of death.[14] Cancer has been kept in the second position, but its frequency has continued decreasing (2017: 16.8% vs. 2020: 16.6% vs. 2022: 15.2% of all deaths in both sexes).[14,15] The reported the lifetime risk of being diagnosed with some type of cancer was approximately 41.5% based on incidence and mortality data for the period 2017 – 2019.[16]

IMPROVEMENTS

- Cancer ↓ from the 1st to 2nd cause of death in PR.
- Cancer frequency is ↓.

Leading causes of death, Puerto Rico 2015 - 2020



Note. Causes of death sorted according the first causes of death of 2020.
[a] Rates per 100,000 inhabitants.

Adapted from: Departamento de Salud de Puerto Rico. Informe Anual de Estadísticas Vitales: Defunciones, años 2017 al 2020). San Juan, PR; 2023. Secretaría Auxiliar de Planificación y Desarrollo, División de Estadísticas.

Cancer Incidence and Mortality for All Cancer Types

Two important epidemiological measures to monitor the cancer burden are incidence and mortality. According to the age-adjusted incidence rate trends for all cancer types during the period 2000 – 2019 in Puerto Rico, a significant increase in the overall frequency of cancer has been observed [from 294.2 per 100,000 in 2000 to 370.2 per 100,000 in 2019 (AAPC = 1.2; p <0.05)].[17] It is important to clarify that the 2020 incidence rate (299.4 per 100,000) was not included in the trend analysis due to the impact of COVID-19 on cancer incidence data of 2020. Nevertheless, the age-adjusted mortality rates have shown a significant reduction in the number of deaths caused by cancer [from 139.1 per 100,000 in 2000 to 102.6 per 100,000 in 2020 (AAPC = -1.6%; p <0.05)].

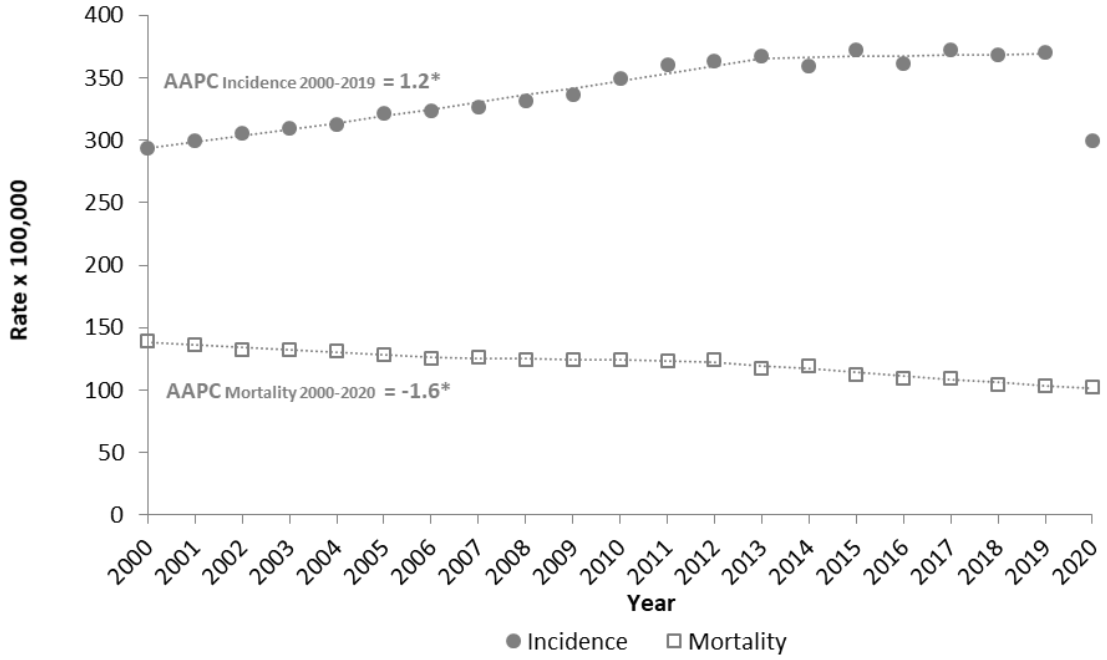
IMPROVEMENT

- Overall cancer mortality rate is ↓.

WORSENING

- Overall cancer incidence rate is ↑.

Age-adjusted incidence and mortality rates for all cancer sites, Puerto Rico 2000 – 2020[a]



[a] Rates are per 100,000 and age-adjusted to the 2000 US Standard Population.
AAPC = Average Annual Percent Change
** Indicates that the AAPC is significantly different from zero (p<0.05).*
Source. Puerto Rico Central Cancer Registry & Demographic Registry of Puerto Rico. Incidence Case File & Mortality Case File of Puerto Rico. San Juan, PR. 2023.

During the 2016 – 2020 period, a total of 71,769 persons were diagnosed with invasive cancer in Puerto Rico (52.3% men vs. 47.7% women).[16] On average, 8,344 men and 7,604 women were diagnosed with cancer each year. The possibility of being diagnosed with cancer increased with age (< 20 years: 0.8%; 20-34 years: 2.6%; 35-49 years: 9.6%; 50-64 years: 28.9%; 65-79 years: 42.7%; and >79 years: 15.3%), and the median age at diagnosis was 67 years. For the same period, a total of

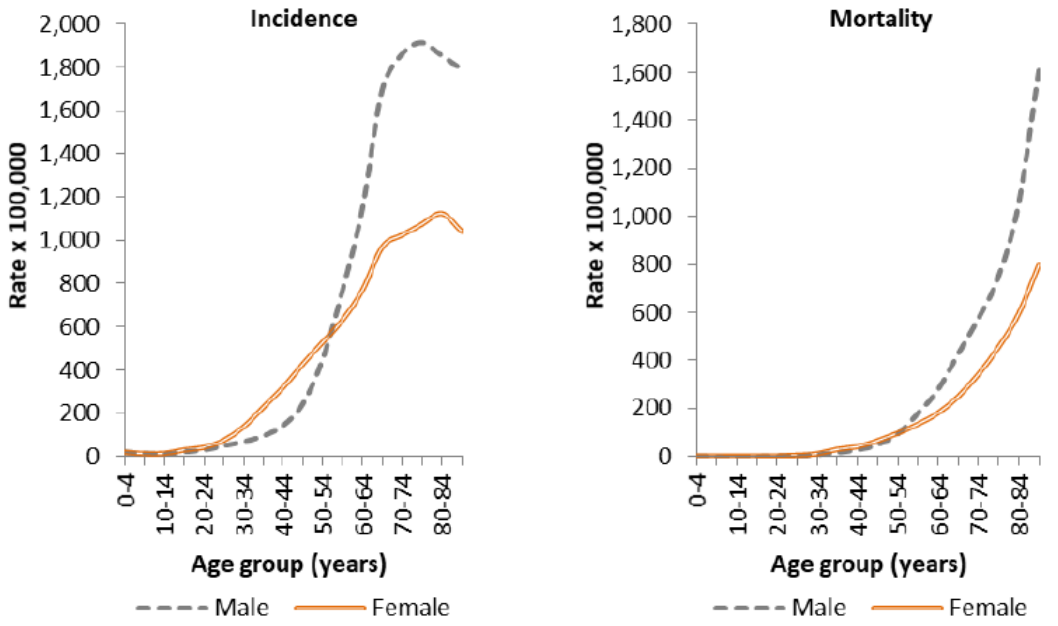
SPOTLIGHT

- Cancer incidence and mortality rates ↑ with age.
- Cancer incidence and mortality rates varied by sex, age and municipality (geographic region).

25,870 cancer deaths were registered in Puerto Rico (55.0% men vs. 45.0% women). On average, the annual number of cancer deaths were 2,848 in men and 2,326 in women. The possibility of dying from cancer mostly increased with age (< 20 years: 0.3%; 20-34 years: 0.8%; 35-49 years: 4.8%; 50-64 years: 20.0%; 65-79 years: 42.0%; and >79 years: 32.2%) and the median age at death was 73 years.

The cancer incidence and mortality rates also showed variations by sex and age.[16] During the 2016 – 2020 period, the risk of developing cancer in males increased significantly from the end of their fourth decade of life onward, whereas for females, it was observed a slow and steady increase from 25 years onward. In addition, at older age, specifically in the 70-74 age group, the risk of developing some type of cancer was almost twice in males compared to females (RR= 1.8, $p<0.05$). Respect to mortality, the risk of dying from cancer was similar for both sexes until they reach 45-49 years; after that age range, the mortality rate in males began to increase considerably faster than in females. Specifically, males 85 years and older had twice the risk of dying from cancer than females of the same age-group (RR=2.0, $p<0.05$).

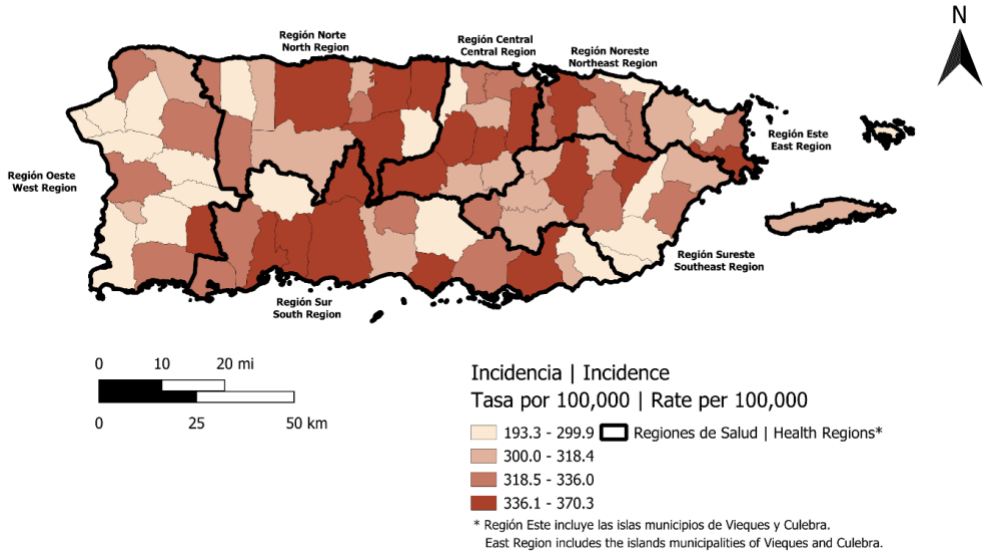
Age-specific incidence and mortality rates for all cancers by sex, Puerto Rico, 2016 – 2020



Source. Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry.

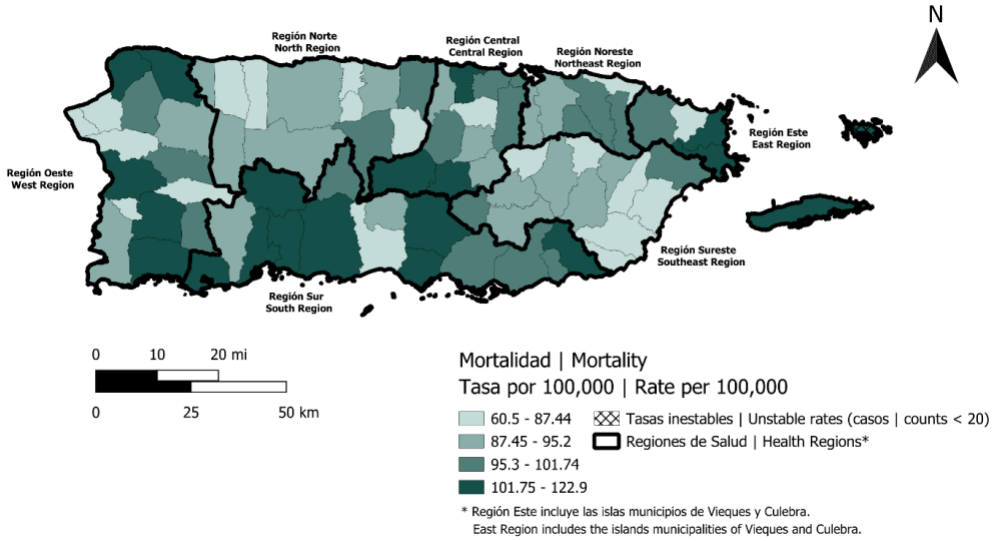
Moreover, there were observed variations in the distribution of the average annual cancer incidence and mortality rates for all types by municipality during period 2016 – 2020.[16] The higher incidence rates were presented mainly in the municipalities located in the Southern, Northern, and Central regions of Puerto Rico, whereas the higher mortality rates were observed in the Northern, and Southeast regions.

Age-adjusted incidence rates for all cancer sites by municipality, Puerto Rico 2016 – 2020[a]



[a] Rates are per 100,000 and age-adjusted to the 2000 US Standard Population.
Source. Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry.

Age-adjusted mortality rates for all cancer sites by municipality, Puerto Rico 2016 – 2020[a]



[a] Rates are per 100,000 and age-adjusted to the 2000 US Standard Population.
Source. Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry.

Leading Cancers in Puerto Rico

TOP LEADING CANCER (Incidence)

Male
- Prostate (38.3%)

Female
- Breast (30.5%)

IMPROVEMENT
- Incidence trends for lung and bronchus cancer in males.

LITTLE/ NO CHANGE
- Incidence trend for colorrectal cancer in both sexes.

WORSENING
- Incidence trend for prostate cancer (males).
- Incidence trends for breast and corpus and uterus cancer (females).

The most frequent cancers diagnosed during the 2016 – 2020 differed by sex.[16] The 2020 incidence rate was not used to calculate the incidence average annual percent change (AAPC) due to the impact of COVID-19 on cancer incidence data of 2020. Among males, the most diagnosed cancer was prostate cancer (38.3%), which had an average increase in incidence trend (AAPC = 1.7%, p<0.05) per year during the 2000 – 2019 period; followed by colon and rectum cancer (11.5%), which maintained a stable incidence trend (AAPC = 0.2%, p>0.05); and lung and bronchus cancer (5.4%), which had an average decrease per year (AAPC = -1.0%, p<0.05). The other most frequent cancer sites in males were urinary bladder, non-Hodgkin lymphoma, oral cavity and pharynx, liver and bile duct, kidney and renal pelvis, leukemia, and pancreas. Regarding females, breast cancer was the most diagnosed cancer (30.5%), which showed an average increase per year (AAPC = 1.7%, p<0.05); followed by colon and rectum cancer (10.5%), which maintained a stable incidence trend (AAPC = -0.1%, p>0.05); and corpus and uterus, not otherwise specified (NOS) cancer (9.6%), which had an average increase per year (AAPC = 4.6%, p<0.05). The other most frequent cancer sites in females were thyroid, lung and bronchus, non-Hodgkin lymphoma, cervix uteri, pancreas, leukemia, and ovary. These cancers represent approximately 80% of the cancers in males and females.

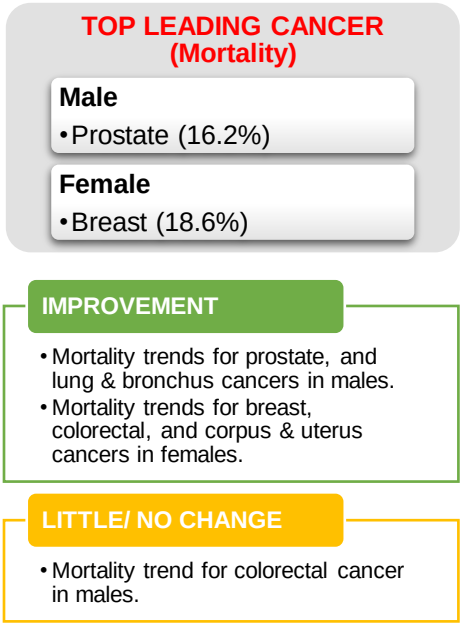
Top ten incidence cancer sites, all ages, Puerto Rico 2016 – 2020

♂ Male (N = 37,548)	%	AAPC$^{2000-2019}$	♀ Female (N = 34,221)	%	AAPC$^{2000-2019}$
Prostate	38.3	↑ 1.7*	Breast	30.5	↑ 1.7*
Colon and rectum	11.5	0.2	Colon and rectum	10.5	-0.1
Lung and bronchus	5.4	↓ -1.0*	Corpus and uterus, NOS	9.6	↑ 4.6*
Urinary bladder	4.4	0.1	Thyroid	9.5	↑ 9.0*
Non-Hodgkin lymphoma	3.9	↑ 1.8*	Lung and bronchus	4.0	0.4
Oral cavity and pharynx	3.5	↓ -0.7*	Non-Hodgkin lymphoma	3.9	↑ 2.1*
Liver and bile duct	3.5	↑ 1.9*	Cervix uteri	2.8	0.5
Kidney and renal pelvis	3.1	↑ 4.3*	Pancreas	2.5	↑ 3.1*
Leukemia	2.8	↑ 2.2*	Leukemia	2.4	↑ 2.7*
Pancreas	2.6	↑ 2.2*	Ovary	2.3	↑ 0.8*
Other sites	21.1		Other sites	21.9	

Note. Statistics were generated for malignant tumors only; includes urinary bladder cancer *in situ*.
Data Source: Puerto Rico Central Cancer Registry Incidence Case File (May 11, 2023).
Incidence cases file population of 2017 are restricted to the first 6 months of the year (January to June).
Cases from July to December were excluded due to the population change after hurricanes Irma and María.
Due to the impact of COVID-19, the 2020 incidence data is excluded from average annual percent changes (AAPC).

Source. Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry.

Likewise, the observed for the leading incidence cancer sites, the most common types of cancer as a cause of cancer death differed by sex during the period 2016 – 2020.[16] Among males, the most common cause of cancer death was prostate (16.2%), which showed an average decrease per year (AAPC = 3.4%, p<0.05) during the 2000 – 2020 period; followed by colon and rectum cancer (13.3%), which maintained a stable mortality trend (AAPC = -0.8%, p>0.05); and lung and bronchus cancer (11.5%), which had an average decrease per year (AAPC = 3.0%, p<0.05). The other most common mortality cancer sites in males were the liver and bile duct, pancreas, leukemia, stomach, oral cavity and pharynx, non-Hodgkin lymphoma, and esophagus. Among females, breast cancer was the most common cause of cancer death (18.6%), which showed an average decrease per year (AAPC = -0.6%, p<0.05); followed by colon and rectum cancer (12.7%), which had an average decrease per year (AAPC = 1.5%, p<0.05); and lung and bronchus cancer (8.9%), which had an average decrease per year (AAPC = -1.7%, p<0.05). The other most common mortality cancer sites in females were the pancreas, corpus and uterus, liver and bile duct, ovary, leukemia, stomach, and non-Hodgkin lymphoma. These cancers represent around 70% of cancers in males and females.



Top ten mortality cancer sites, all ages, Puerto Rico 2016 – 2020

♂ Male (N = 14,240)	%	AAPC[2000-2020]	♀ Female (N = 11,630)	%	AAPC[2000-2020]
Prostate	16.2	↓ -3.4*	Breast	18.6	↓ -0.6*
Colon and rectum	13.3	-0.8	Colon and rectum	12.7	↓ -1.5*
Lung and bronchus	11.5	↓ -3.0*	Lung and bronchus	8.9	↓ -1.7*
Liver and bile duct	7.9	0.1	Pancreas	6.3	↑ 0.8*
Pancreas	6.1	0.5	Corpus and uterus, NOS	5.8	↑ 1.3*
Leukemia	3.8	↓ -1.1*	Liver and bile duct	4.7	↓ -1.5*
Stomach	3.4	↓ -5.0*	Ovary	4.4	-0.5
Oral cavity and pharynx	3.3	↓ -3.0*	Leukemia	3.8	↓ -1.3*
Non-Hodgkin lymphoma	3.1	↓ -1.5*	Stomach	3.2	↓ -4.2*
Esophagus	3.0	↓ -4.2*	Non-Hodgkin lymphoma	3.0	↓ -2.1*
Other sites	28.4		Other sites	28.6	

Source. Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry.

For the period 2016 – 2020, additional variations in incidence and mortality cancer sites were observed when the rates per cancer site were categorized by sex and age group among the adult population (>19 year)[16] (Please refer to Annex III: Complementary tables and figures).

Incidence and Mortality Rates for Specific Cancer Sites

Age-adjusted cancer incidence rates using three standard populations [Puerto Rico 2000, United States 2000 (Census P25-1130), World (Segi 1960)], reflected that the highest cancer incidence rates for the period 2016 – 2020 in Puerto Rico were for prostate cancer in males (132.9 per 100,000 males), breast cancer in females (90.0 per 100,000 females), thyroid cancer in females (36.8 per 100,000), colon and rectum (35.0 per 100,000 both sexes; 42.4 per 100,000 males; 29.0 per 100,000 females), and corpus and uterus, not otherwise specified (NOS) (29.3 per 100,000 females).[16]

Incidence for specific cancer sites by sex, Puerto Rico 2016 – 2020

Sex →	Overall					Male					Female				
Cancer site† ↓	Count	Crude rate*	Age-adjusted rates Standard population:			Count	Crude rate*	Age-adjusted rates Standard population:			Count	Crude rate*	Age-adjusted rates Standard population:		
			PR	US	World			PR	US	World			PR	US	World
All Sites	71,769	487.0	325.7	351.8	251.6	37,548	536.5	363.1	391.9	271.2	34,221	442.2	299.0	323.7	238.1
Oral Cavity and Pharynx	1,848	12.5	8.2	8.9	6.3	1,325	18.9	13.1	14.1	9.9	523	6.8	4.3	4.6	3.3
Esophagus	621	4.2	2.5	2.8	1.8	522	7.5	4.8	5.2	3.5	99	1.3	0.7	0.8	0.4
Stomach	1,409	9.6	5.8	6.5	4.0	772	11.0	7.2	8.0	4.9	637	8.2	4.7	5.3	3.3
Colon and Rectum	7,894	53.6	35.0	38.1	26.3	4,317	61.7	42.4	46.1	31.7	3,577	46.2	29.0	31.7	21.8
Liver and Intrahepatic Bile Duct	1,828	12.4	7.6	8.2	5.5	1,300	18.6	12.2	13.2	8.9	528	6.8	3.8	4.2	2.7
Pancreas	1,829	12.4	7.6	8.4	5.3	958	13.7	9.0	9.9	6.4	871	11.3	6.4	7.1	4.4
Larynx	647	4.4	2.7	2.9	2.0	590	8.4	5.6	6.0	4.1	57	0.7	0.4	0.5	0.3
Lung and Bronchus	3,385	23.0	13.7	15.1	9.4	2,017	28.8	18.3	20.4	12.5	1,368	17.7	10.0	11.1	7.0
Skin Melanoma	674	4.6	3.2	3.5	2.4	391	5.6	4.0	4.4	2.9	283	3.7	2.6	2.8	2.1
Prostate	~	~	~	~	~	14,376	205.4	132.9	141.3	99.4	~	~	~	~	~
Testis	~	~	~	~	~	383	5.5	5.8	6.0	5.5	~	~	~	~	~
Breast	~	~	~	~	~	~	~	~	~	~	10,438	134.9	90.0	97.5	71.8
Cervix Uteri	~	~	~	~	~	~	~	~	~	~	970	12.5	10.9	11.9	9.5
Corpus and Uterus, NOS	~	~	~	~	~	~	~	~	~	~	3,299	42.6	29.3	31.2	23.9
Ovary	~	~	~	~	~	~	~	~	~	~	780	10.1	7.2	7.8	6.0
Urinary Bladder	2,217	15.0	8.7	9.8	5.7	1,635	23.4	14.7	16.5	9.5	582	7.5	4.1	4.6	2.7
Kidney and Renal Pelvis	1,797	12.2	8.3	8.9	6.7	1,167	16.7	11.8	12.6	9.2	630	8.1	5.5	5.9	4.5
Brain and Other Nervous System	737	5.0	4.1	4.2	3.7	396	5.7	4.9	5.0	4.5	341	4.4	3.3	3.4	2.8
Thyroid	4,096	27.8	24.1	25.6	21.3	828	11.8	9.9	10.4	8.5	3,268	42.2	36.8	39.2	32.9
Hodgkin Lymphoma	385	2.6	2.5	2.5	2.3	213	3.0	2.9	2.9	2.7	172	2.2	2.1	2.1	1.9
Non-Hodgkin Lymphoma	2,795	19.0	12.8	13.9	9.8	1,477	21.1	15.1	16.6	11.4	1,318	17.0	10.8	11.8	8.3
Myeloma	1,304	8.8	5.5	6.1	4.0	675	9.6	6.4	7.1	4.6	629	8.1	4.9	5.4	3.5
Leukemia	1,889	12.8	9.1	9.8	7.4	1,057	15.1	11.0	12.0	8.5	832	10.8	7.6	8.1	6.4

** Rates per 100,000 population. † Excludes basal and squamous cell carcinomas of the skin except when these occur on the skin of the genital organs and in situ cancers except urinary bladder. ~ Not applicable. PR = Puerto Rico; US = United States of America Source. Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry.*

In terms of mortality, the highest age-adjusted cancer mortality rates for the period 2016 – 2020 in Puerto Rico were observed for prostate cancer in males (17.8 per 100,000 males), breast cancer in females (15.6 per 100,000 females), colon and rectum (13.9 per 100,000 both sexes; 16.0 per 100,000 males; 9.6 per 100,000 females), and lung and bronchus cancer (10.6 per 100,000 both sexes; 13.3 per 100,000 males; 6.4 per 100,000 females).[16]

Mortality for specific cancer sites by sex, Puerto Rico 2016 – 2020

Sex →	Overall					Male					Female				
Cancer site ↓	Count	Crude rate*	Age-adjusted rates Standard population:			Count	Crude rate*	Age-adjusted rates Standard population:			Count	Crude rate*	Age-adjusted rates Standard population:		
			PR	US	World			PR	US	World			PR	US	World
All Sites	25,870	157.7	94.7	106.0	63.7	14,240	182.8	117.7	132.3	76.8	11,630	135.1	77.7	86.8	53.6
Oral Cavity and Pharynx	598	3.6	2.2	2.4	1.6	467	6.0	3.9	4.2	2.9	131	1.5	0.8	0.9	0.5
Esophagus	505	3.1	1.8	2.0	1.3	422	5.4	3.5	3.9	2.4	83	1.0	0.5	0.6	0.3
Stomach	858	5.2	3.1	3.5	2.0	487	6.3	4.0	4.6	2.6	371	4.3	2.4	2.7	1.5
Colon and Rectum	3,361	20.5	12.5	13.9	8.5	1,887	24.2	16.0	17.8	11.1	1,474	17.1	9.6	10.8	6.4
Liver and Intrahepatic Bile Duct	1,676	10.2	6.1	6.7	4.2	1,130	14.5	9.4	10.3	6.6	546	6.3	3.4	3.8	2.2
Pancreas	1,601	9.8	5.8	6.5	3.8	863	11.1	7.2	8.0	4.9	738	8.6	4.6	5.2	2.9
Larynx	213	1.3	0.8	0.8	0.5	193	2.5	1.6	1.7	1.1	20	0.2	0.1	0.1	0.1
Lung and Bronchus	2,664	16.2	9.5	10.6	6.2	1,634	21.0	13.3	14.9	8.8	1,030	12.0	6.4	7.3	4.1
Skin Melanoma	122	0.7	0.4	0.5	0.3	75	1.0	0.6	0.7	0.4	47	0.5	0.3	0.3	0.2
Prostate	~	~	~	~	~	2,311	29.7	17.8	21.2	9.3	~	~	~	~	~
Testis	~	~	~	~	~	32	0.4	0.4	0.4	0.4	~	~	~	~	~
Breast	~	~	~	~	~	~	~	~	~	~	2,163	25.1	15.6	17.1	11.6
Cervix Uteri	~	~	~	~	~	~	~	~	~	~	234	2.7	2.0	2.2	1.7
Corpus and Uterus, NOS	~	~	~	~	~	~	~	~	~	~	677	7.9	4.8	5.2	3.5
Ovary	~	~	~	~	~	~	~	~	~	~	507	5.9	3.6	3.9	2.6
Urinary Bladder	578	3.5	1.9	2.2	1.1	385	4.9	3.0	3.5	1.7	193	2.2	1.1	1.3	0.6
Kidney and Renal Pelvis	423	2.6	1.5	1.7	1.0	276	3.5	2.3	2.5	1.6	147	1.7	0.9	1.1	0.6
Brain and Other Nervous System	560	3.4	2.3	2.5	1.8	278	3.6	2.6	2.8	2.1	282	3.3	2.0	2.2	1.5
Thyroid	101	0.6	0.4	0.4	0.2	43	0.6	0.4	0.4	0.2	58	0.7	0.4	0.4	0.2
Hodgkin Lymphoma	73	0.4	0.3	0.3	0.2	45	0.6	0.4	0.4	0.3	28	0.3	0.2	0.2	0.1
Non-Hodgkin Lymphoma	792	4.8	3.0	3.3	2.0	442	5.7	3.8	4.3	2.5	350	4.1	2.3	2.6	1.5
Myeloma	645	3.9	2.3	2.6	1.4	335	4.3	2.7	3.1	1.8	310	3.6	1.9	2.2	1.2
Leukemia	991	6.0	3.7	4.1	2.5	546	7.0	4.6	5.2	2.9	445	5.2	3.0	3.4	2.1

** Rates per 100,000 population. † Excludes basal and squamous cell carcinomas of the skin except when these occur on the skin of the genital organs and in situ cancers except urinary bladder. ~ Not applicable.PR = Puerto Rico; US = United States of America Source. Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry.*

PART III: Implementation of the Puerto Rico Comprehensive Cancer Control Plan

The PRCCC Plan 2025 – 2030 is organized in four priority areas for action: ***prevention, screening and early detection, treatment, and survivorship and quality of life***. These priority areas address different needs within the cancer control continuum and provide updated information. Goals, objectives, and strategic actions were delineated to achieve what was proposed.

Prevention

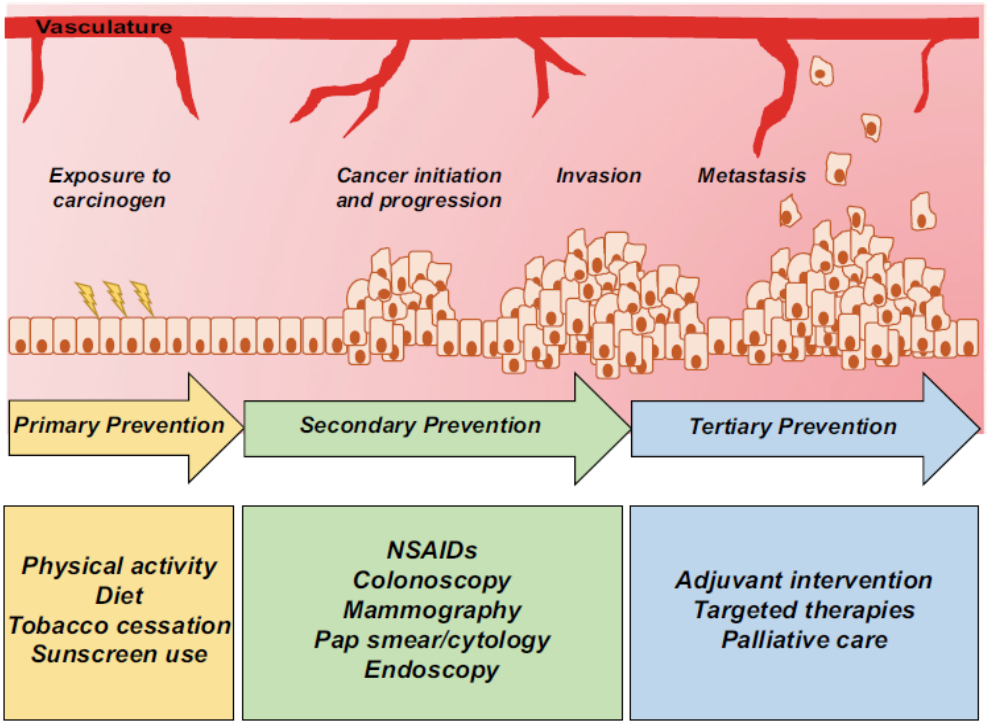
GOAL Prevent cancer in Puerto Rico through the reduction of risk factors.

Cancer prevention refers to the actions taken by individuals or communities to reduce the chance of getting cancer.[18] It can be defined as well as the reduction of cancer mortality through the reduction in cancer incidence.[19] The risk of developing cancer may be influenced by a mixture or interaction of genetic and environmental factors, including behavioral, lifestyle, and environmental exposures.[20] Among the factors associated with an increased risk for cancer are: ***cigarette/tobacco smoking and secondhand smoke, alcohol, diseases related to infectious agents (i.e., Helicobacter pylori, HBV, and HPV), poor diet, physical inactivity, obesity, diabetes, radiation (i.e., ultraviolet exposure to the sun or artificial sources), chemicals and other pollutants in the environment, chronic stress, hormones, and immunosuppression after organ transplantation***.[19,21–23] A study from van Tuijl et al.[24] did not find an association between depression or anxiety and an increased risk for cancer outcomes, except for lung cancer. On the other hand, recent literature has suggested that long COVID-19 may predispose to cancer development or accelerate cancer progression due to chronic inflammation and tissue damage.[25] It has been established in literature that about 1 out of each 10 all cancer cases are related to genetic factors whereas the remaining to the environment and lifestyles. In terms of mortality, 30% – 35% of the deaths have been related to poor diet, followed by 25% – 30% to tobacco use, 15–20% to infections, and the remaining to other risk factors.[26] However, it is important to highlight that the term ***cancer*** is not a single disease but a group of heterogeneous related diseases and that risk factors depend on the type of cancer even when some types of cancer may have risk factors in common[16,18,21] (Please refer to Annex III: Complementary tables and figures, pp. 69).

Moreover, cancer risk is not equal for all individuals within a population.[20] For example, individuals at average-risk for cancer are those in the general population. Whereas moderate-risk refers to those individuals that, because of age or exposure to risk factors, have had cancer screenings or procedures with benign findings. Finally, high-risk individuals are those with a heritable condition, cancer history in their family with genetic susceptibility or have had cancer previously.

Fortunately, **cancer prevention can occur anytime in the cancer control continuum**.[20] Several prevention measures have been identified and used to reduce cancer incidence at primary (e.g., tobacco cessation, changes in dietary patterns), secondary (e.g., screening procedures, testing), and tertiary (e.g., survival cancer plan) phases, reduce mortality and improve quality of life among survivors.

Cancer prevention through the cancer control continuum



Source: Loomans-Kropp HA, Umar A. Cancer prevention and screening: the next step in the era of precision medicine. NPJ Precis Oncol 2019:3:1-8. Figure 2 pp.3.

Opportunity

Between 30% to 50% of the cancer cases are preventable (i.e., vaccines, healthy choices) and others can be redcuced through early detection when treament work best.[21,23] However, considering that the population in Puerto Rico is aging, and that the risk of developing cancer increases with age and varies by sex and geopgraphic location, among other factors, special attention and efforts such as preventing risk factors are needed to adress the high demand of resources and reduce health disparities.

According to 2016 – 2020 data, some of the most common cancer incidence and mortality sites in Puerto Rico correspond to preventable cancers – ***lung, liver, stomach, cervix uteri***.[16] Health-related risk factors, chronic health conditions, and use of preventive services are monitored in the adult population (≥ 18 years) using the CDC Behavioral Risk Factors Surveillance System (BRFSS).[27] Among the cancer-related risk factors monitored by the Puerto Rico BRFSS (PR-BRFSS) can be mentioned: health insurance coverage, exercise, physical activity, chronic diseases - diabetes, hypertension, obesity - and some behavioral risk habits - use of tobacco, e-cigarettes, alcohol, and depression.

Data from the BRFSS showed that the prevalence of health insurance coverage in Puerto Rico for 2022 was slightly higher when compared to the median in the United States (96.2% vs. 93.0%) and has increased respect to 2010 data (96.2% vs. 92.1%).[28] Nevertheless, the prevalence of diabetes, a chronic condition that is a common comorbidity among cancer patients, has increased in Puerto Rico during the last decade (2022: 17.7% vs. 2010: 12.8%) and was also greater than the prevalence for United States (2022: PR 17.7% vs. US 11.5%). Likewise, the prevalence of hypertension has increased through the years (2021: 41.8% vs. 2009: 34.0%) and was higher than the prevalence for United States (2021: PR 41.8% vs. US 32.4%). Similarly, the prevalence of obesity and overweight has increased in Puerto Rico (2022: 70.7% vs. 2010: 65.6%) and was higher than the observed in the United States (2022: PR 70.7% vs. US 67.7%). Whereas the prevalence of physical activity has slightly decreased in the last years (2022: 56.4% vs. 2010: 57.7%) and was significantly lower than the prevalence for United States (2022: PR 56.4% vs. US 76.6%). According to 2021 data on fruit and vegetable consumption, the prevalence in Puerto Rico was lower than United States (fruits: PR 48.9% vs. US 59.2% | vegetables: PR 53.4% vs. US 80.3%). Nevertheless, the prevalence of current smoking (9.4%) and binge drinking (13.4%) in Puerto Rico for 2023 were lower than United States (14.0% and 17.2%, respectively). Likewise, the prevalence of depression in Puerto Rico was lower compared to the prevalence in United States for 2022 (PR: 17.5% vs. US: 21.5%) but slightly higher than the 2012 prevalence (2022: 17.5% vs. 2012: 12.1%).

Cancer-related risk factors in the U.S and Puerto Rico, BRFSS

Risk factor	2010		2022	
	U.S. (Md %)	PR (%)	U.S. (Md %)	PR (%)
Health insurance coverage	85.0%	92.1%↑	93.0%	96.2%↑
Diabetes	8.7%	12.8% ↑	11.5%	17.7%↑
Hypertension[a, c]	28.7%[a]	34.0%[a]↑	32.4%[c]	41.8%[c]↑
Overweight/Obesity	63.7%	65.6%↑	67.7%	70.7%↑
Physical activity (last month)	76.1%	57.7%↓	76.6%	56.4%↓
Fruit and vegetables (5+/day)[a]	23.4%[a]	17.7%[a]↓	---	---
Fruit consumption (1+/day)[b]	---	---	59.2%[b]	48.9%[b]↓
Vegetable consumption (1+/day)	---	---	80.3%[b]	53.4%[b]↓
Current smokers	17.3%	11.9%↓	14.0%	9.4%↓
Alcohol use (binge drinking)	15.1%	12.1%↓	17.2%	13.4%↓
Depression (ever)[b]	18.0%[b]	16.3%[b]↓	21.7%	17.5%↓

Note. [a] available data from 2009; [b] available data from 2012; [c] available data from 2021; --- data not available.
Source: BRFSS (https://www.cdc.gov/brfss/brfssprevalence/)

Considering that some risk factors can be controlled or changed, the following risk factors were selected to be prioritized during the next years to reduce their occurrence and thus improve cancer control in Puerto Rico. For each risk factor, objectives, prevention measures, and strategic actions were delineated.

Human Papillomavirus (HPV) Vaccination – Infection

Some HPV variants have been related to several cancer types (i.e., oral, anal, vulvar, vaginal, cervix, penile) (see Annex III – Complementary tables and figures pp. 69).[16]

Objective No. 1: By 2030, increase the percent of youth 13-15 years old that have completed HPV vaccine series.		
Measure	**Baseline (year)**	**Target 2030**
Youth 13-17 years old that have completed the HPV vaccine series (2+ doses).	67.2% (2021)	71.2 - 72.6%

Source: National Cancer Institute. Cancer State Profiles: Puerto Rico. 2024; Healthy People 2030.
Note. Due to the Healthy People 2030 recommendation of 80.0% is higher than the baseline, the 2030 target is based on 6% to 8% of improvement.

Strategic actions:

1. Continue educating physicians, nurses, and other healthcare providers on effective communication with parents and youth on HPV recommendations for complete immunization and the importance to register this data.
    a. Promote training and refreshers opportunities on the Puerto Rico Electronic Immunization System (PREIS, https://prcp1web.stchealthops.com/iweb/) that can be offered by personnel from the Division of Immunization of the Puerto Rico Department of Health (PRDOH).
    b. Promote train-the-trainers' workshops.
2. Partner with government agencies [e.g., PRDOH, Puerto Rico Department of Education (PRDOE)], clinical facilities and community organizations to:
    a. organize activities during August (Human Papilloma Virus Awareness Month Proclamation).
    b. deliver island-wide outreach and educational activities and campaigns targeted to parents and age-eligible individuals to increase public awareness of the HPV vaccine benefits through their human resources (i.e., young promoters from the Youth Advisory Council from the PRDOH and school nurses).
    c. promote the use EBIs to increase vaccination rates and educate about HPV-related cancers.
    d. conduct providers and community need assessments to assess barriers.
    e. incorporate assessments from different perspectives (patients/parents, providers, agencies) to obtain feedback about processes and outcomes to identify and reduce potential barriers.

Nutrition and Physical Inactivity

Poor diet and lack of physical activity have been related to several cancer types (i.e., colon, breast, corpus and uterus, NOS) (see Annex III – Complementary tables and figures pp. 69).[16]

Objective No. 2: By 2030, increase the percent of adults who participate in any physical activity during the past month.		
Measure	**Baseline (year)**	**Target 2030**
Adults who participate in any physical activity during the past month.	56.4% (2022)	58.6%

Source: BRFSS (https://www.cdc.gov/brfss/brfssprevalence/).
Note. The target is based on the previous 2020 target due to it not being reached.

Strategic actions:

1. Continue educating physicians, other healthcare providers, and policymakers regarding the importance of including education on physical activity as part of their assessment during their interactions with patients.

2. Advocate for policies and regulations that address access to safe and accessible spaces for physical activity.
3. Reduce the gap between knowledge and action by developing consortiums composed of different organizations (e.g., government, non-for profit, healthcare, community) and at different levels (municipal → community → neighborhood).
    a. Promote educational activities, training, and workshops, including adapted physical activities for cancer patients, older adults, and other vulnerable populations.
4. Promote educational activities and active pauses at work in public and private settings as well as activities tailored to reduce recreational sedentary screen time in non-school or non-work-related settings.
5. Advocate for the re-implementation of the physical education curriculum as a requirement at schools, thus promoting an early start to this healthy lifestyle.

Objective No. 3: By 2030, increase achievement and maintenance of a healthy weight throughout life among adults and adolescents.		
Measure	**Baseline (year)**	**Target 2030**
Adults self-reported normal weight (BMI: 18.5-24.9 kg/m^2).	26.7% (2022)	32.7%
Adolescents with obesity (BMI: ≥ 30.0 kg/m^2).	21.0% (2022)	15.5%

Source: BRFSS (https://www.cdc.gov/brfss/brfssprevalence/); YRBS (https://nccd.cdc.gov/youthonline/App/Results.aspx?LID=PR); Healthy People 2030.
Note. For adults, the target is based on the previous 2020 target due to it not being reached. For adolescents, the target is based on the Healthy People 2030.

Strategic actions:

1. Continue educating physicians and other health providers and policymakers on:
    a. the importance to incorporate education on the importance of maintaining a healthy weight, including how to calculate the BMI, what implications each category have (underweight, normal, overweight obese) and what the patient can do to keep a healthy weight as part of their assessment and talks with patients.
    b. the importance of keeping a healthy weight to reduce cancer risk.
    c. the integration of other metrics to determine healthy weight such as waist circumference measure and risk factors for diseases and conditions associated with obesity (e.g., high blood pressure, high LDL cholesterol, high blood glucose).
2. Promote educational activities at communities and clinical facilities to educate about healthy weight among the population, including the importance of measuring waist circumference and BMI as a preventive measure in the early identification of excess body fat and strategies to keep a healthy and stable weight.
3. Partner with government agencies (e.g., PRDOH, PRDOE, Puerto Rico Department of Sports and Recreation, Puerto Rico Department of Family Affairs] and community organizations to:
    a. deliver island-wide outreach and educational activities and public campaigns to promote healthy weight, including the risks of not keeping a healthy weight such as cancer risk, among others.
    b. promote the use of EBIs to reduce the number of persons with underweight, overweight or obese.
    c. promote the use of the *Clinical Practice Guideline for the Evaluation and Treatment of Children and Adolescents with Obesity* from the American Academy of Pediatrics.
    d. promote mobile or web-based education and programs, especially among youth, developed by certified professionals.

Objective No. 4: By 2030, increase the consumption of recommended services of fruits and vegetables in adults.		
Measure	**Baseline (year)**	**Target 2030**
Adults who have consumed fruits and vegetables (1 or more times per day).	32.5% (2019) 31.5% (2021)	34.7%

Source: BRFSS (https://www.cdc.gov/brfss/brfssprevalence/); Serrano-Rodríguez RA, Rodríguez-Alamo N. Cancer-Related Risk Factors, Puerto Rico 2016-2020. May 2023. Puerto Rico Behavioral Risk Factor Surveillance System, Puerto Rico Department of Health.
Note. The target is based on 10% of improvement.

Strategic actions:

1. Reinforce the adoption of healthy food guidelines and practices (e.g., provide training/refreshers) and ensure that options for healthy food are accessible in stores and vending machines at public, private, and community settings.
2. Continue promoting education through massive public campaigns that address the benefits of eating fruits and vegetables through the life course, including cancer patients and other vulnerable populations.
3. Continue supporting the development and implementation of public policies toward healthy snacks and foods at public and private settings, including schools (e.g., smart snacks).
4. Continue with the partnerships for the development of consortiums that promote healthy eating (e.g., PRDOH; PRDOE including the "Asociacion de Comedores Escolares"/School Canteens Association; Department of Agriculture, Agricultural Extension Service) and community organizations to:
    a. deliver island-wide outreach and educational activities and public campaigns to promote healthy eating and its benefits.
    b. promote the use of EBIs to increase the number of people consuming vegetables and fruits daily.
    c. promote the access and establishment of farmers markets and individual and locally grown foods.

Tobacco Use

Tobacco use has been related with lung cancer, which is the third cause of death for males and females in Puerto Rico.[16,29] It has been related to other cancer sites (i.e., oral, esophagus, stomach, liver, among others; see Annex III – Complementary tables and figures pp. 69).[16]

Objective No. 5: By 2030, decrease the prevalence of tobacco products among adults.		
Measure	**Baseline (year)**	**Target 2030**
Adults who are current smokers.	9.4% (2022)	6.1%
Adults who are current e-cigarettes users.	3.2% (2022)	3.0%

Source: BRFSS (https://www.cdc.gov/brfss/brfssprevalence/); Healthy People 2030.
Note. For current smokers, the target is based on the Healthy People 2030; whereas the e-cigarettes users target is based on 5% of improvement.

Strategic actions:

1. Keep updated physicians and other health providers on the policy recommendations for tobacco control (e.g., trainings/boosters, educational materials) and continue Increasing the number of smokers advised to quit smoking.
2. Partner with government agencies [e.g., PRDOH, PRDOE, Puerto Rico Administration of Mental Health and Anti-Addiction Services (ASSMCA)] and other organizations (e.g., Coalición para Puerto Rico Libre de Tabaco) to adopt tobacco prevention practices to:

a. promote the Puerto Rico Quitline “Déjalo ya” from the PRDOH – Tobacco Control Program (referrals).
b. promote EBIs and other educational initiatives such as the recommended in the PRDOH Puerto Rico Tobacco Control Plan for community settings, giving special attention to the different types of tobacco products on the market (i.e., cigarettes, cigars, smokeless tobacco, e-cigarettes, hookah) and cancer-related risk.
c. continue increasing the number of healthcare organizations using health information technologies to identify patients who are current smokers and advise them to quit.

3. Continue promoting island-wide campaigns to increase smokers’ awareness on smoking prevention and cessation as well as the risks of the different types of tobacco products on the market (i.e., cigarettes, cigars, smokeless tobacco, e- cigarettes, hookah) and cancer-related risks.
4. Continue enforcing compliance with laws such as Law No. 40, which prohibits the use of tobacco products in public and private environments.
5. Continue advocating for the inclusion of e-cigarettes in smoke-free laws to prohibit the use of e-cigarettes in restaurants, bars and other public places and workplaces where cigarette smoking is also prohibited.
6. Continue advocating for the adoption of policies to regulate advertising and sales of non-cigarette tobacco products, including adopting or increasing tax rates.

Objective No. 6: By 2030, decrease the percent of self-reported first tried cigarette smoking before age 13 years and current use of electronic vapor products.		
Measure	**Baseline (year)**	**Target 2030**
First tried cigarette smoking before age 13 years (even one or two puffs).	4.6% (2021)	0%
Current use of electronic vapor products among adolescents.	10.0% (2021)	9.0%

Source: YRBS (https://nccd.cdc.gov/youthonline/App/Results.aspx?LID=PR). Healthy People 2030. Puerto Rico also counts with “Consulta Juvenil”, another data source from ASSMCA, which reflected an increase in the use of tobacco products among middle and high schoolers by age and grade during 2020 – 2022.[30]
Note. For self-reported cigarette smoking before age 13 years, the target is based on the Healthy People 2030; whereas the electronic vapor products target is based on 10% of improvement due to the Healthy People 2030 recommendation of 10.5% was already surpassed.

Strategic actions:

1. Partner with government agencies (e.g., PRDOH, PRDOE, ASSMCA), clinical facilities and community organizations that provide youth services to:
   a. deliver island-wide educational activities and public campaigns for tobacco products prevention.
   b. promote EBIs and other educational initiatives such as the recommended in the PRDOH Puerto Rico Tobacco Control Plan for schools and community settings (e.g., “Mi comunidad libre de humo”), giving special attention to the different types of tobacco products on the market (i.e., cigarettes, cigars, smokeless tobacco, e-cigarettes, hookah) and cancer-related risk.
   c. reinforce education on e- cigarettes among youth.
   d. continue promoting tobacco prevention educational activities for students, parents, and school personnel and increase the number of public and private schools participating in this initiative.
   e. continue monitoring tobacco advertising near schools and reduction in the number of commerce in non-compliance with the laws that prohibit the selling of tobacco products to minors.

Objective No. 7: By 2030, increase the number of policies implemented to regulate non-cigarette tobacco products (i.e., electronically nicotine delivery system, snuff, cigars, and chewing tobacco).		
Measure	**Baseline (year)**	**Target 2030**
Number of policies to regulate non-cigarette tobacco products (e.g., electronically nicotine delivery system, snuff, cigars, and chewing tobacco).	6 (2017)	8

Source: Marrero Gerena, G, Ramírez, AL, Ruiz Serrano, K, Felici, G., Díaz García, R & Cases Rosario, A. Lo que todos deben saber del tabaquismo en Puerto Rico.2021. Programa de Control de Tabaco. Programa de Prevención y Control de Enfermedades Crónicas. Departamento de Salud de Puerto Rico.
Note. The current policies are: 1) Law No. 40 (in 1993 (which prohibits smoking in public and private environments), 2) the establishment of the Puerto Rico Quitline "Déjalo ya" in 2004, 3) amendment of Law No. 40 in 2007, 4) coverage for the smoking cessation treatment in 2008, 5) Law No. 41 in 2015 (which prohibits the sale of electronic cigarettes to minors under 18 years, and 6) Law No. 69 in 2017 (which prohibits smoking inside vehicles with minors under 18 years).[31]

Strategic actions:

1. Continue advocating for the inclusion of e-cigarettes and hookah in smoke-free laws to prohibit their use in restaurants, bars and other public places as well as workplaces where cigarette smoking is also prohibited.
2. Continue advocating for the adoption of policies to regulate advertising and sales of non-cigarette tobacco products, including adopting or increasing tax rates.
3. Partner with government agencies (e.g., PRDOH, ASSMCA) and community organizations to:
    a. organize technical support activities for the development or revision of tobacco-related policies.

Alcohol Use

Alcohol use has been related to several cancer types such as oral cavity, pharynx, larynx, esophagus, liver, colon and rectum, female breast) see Annex III – Complementary tables and figures pp. 69).[16] However, additional studies have shown a risk for stomach, pancreatic and prostate cancers as well.[32]

Objective No. 8: By 2030, decrease the prevalence of alcohol use (binge drinking) among adults.		
Measure	**Baseline (year)**	**Target 2030**
Adults who use alcohol (binge drinking)*	13.4% (2022)	12.7%

Source: BRFSS (https://www.cdc.gov/brfss/brfssprevalence/).
*Note. * Binge drinking = 5 ≥ drinks in a single occasion for men; 4 ≥ for women.*[32] *The proposed target is based on 5% of improvement due to the recommendation of the Healthy People 2030 was surpassed (25.4%).*

Strategic actions:

1. Advocate to reinforce the laws prohibiting alcohol sales to minors.
2. Advocate for the regulation of alcohol retailers.
3. Partner with government agencies (e.g., ASSMCA), clinical facilities, and community organizations to:
    a. promote educational activities and campaigns for the population on alcohol use prevention and reduction, including excessive alcohol consumption, associated risks, and underage drinking.
    b. promote alcohol screening and brief motivational interventions during physicians and other health providers interactions with patients.

Radiation – Ultraviolet (UV) Exposure

Ultraviolet exposure has been related to several cancer types (i.e., skin, oral cavity, and pharynx).[16]

Objective No. 9: By 2030, increase the use of sunscreen protection among the population of Puerto Rico.		
Measure	**Baseline (year)**	**Target 2030**
Use of sunscreen protection (always/ often).	24.6% (2016)	25.8%

Source: HINTS PR; Niu Z, Tortolero-Luna G, Lozada C, Heckman CJ, Coups EJ. Correlates of Sun Protection Behaviors Among Adults in Puerto Rico. Int J Behav Med. 2022 Feb;29(1):36-45.
Note. The 2016 HINTS-PR data also showed other common sun protection behaviors among the Puerto Rican adults such as staying in shade or umbrella (70.7%), wearing a long-sleeved shirt (24.6%), and a wide-brimmed hat (16.4%).[33] The target for sunscreen protection is based on 5% of improvement.

Strategic actions:

1. Advocate for policies and regulations on sun protection behaviors and preventive measures.
2. Partner with government agencies (e.g., PRDOH, PRDOE), clinical facilities and physicians, and other health providers (e.g., dermatologists) to:
    a. gather data on the percent of population using sunscreen protection and other metrics.
    b. organize activities during May (Skin Cancer Awareness Month Proclamation).
    c. promote educational activities for the population on the types of UV exposure, the cancer related risks, the importance of using and reapplying sunscreen, in both, indoor and outdoor activities, the benefits of wearing a long-sleeved shirt, wide-brimmed hat and staying in the shade or under an umbrella.
    d. disseminate existing skin cancer prevention education and resources, such as the PRDOH initiative "*Rayito cuida tu piel*".
3. Seek for the establishment and possible cultural adaptation of data collection on radiation and other skin cancer prevention measures using the HINTS data source (https://hints.cancer.gov/). In 2009, a demonstration project was conducted in Puerto Rico using the existing PR-BRFSS infrastructure.

Screening and Early Detection

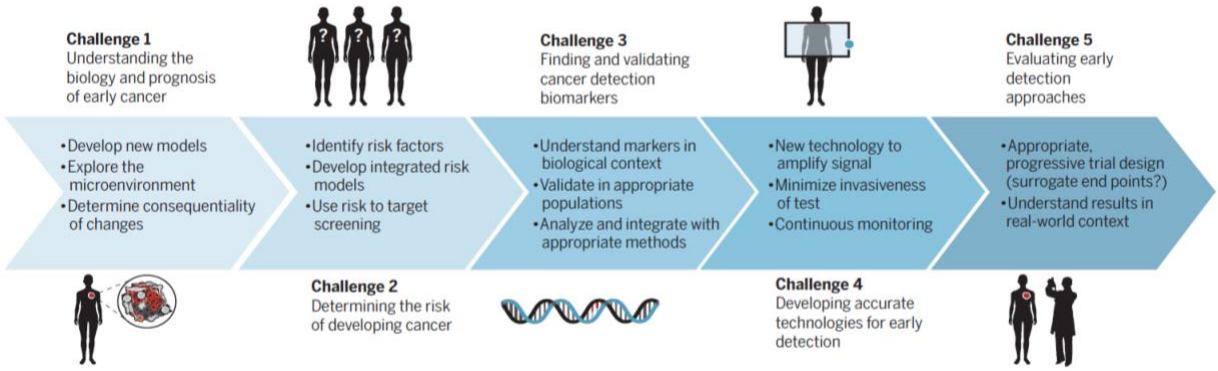
GOAL Increase the early detection of cancer.

Early detection refers to the identification of cancer or precancerous changes as early as possible, before they have had a chance to grow and spread, to increase the chances of successful treatment and survival.[34–37] Early detection can take place across several windows during cancer progression (precancerous changes → malignant transformation → prognostic detection → relapse and recurrence).[35] It consists of two components: early diagnosis and screening.[37] Whereas **early diagnosis** focuses on detecting cancer in symptomatic patients as early as possible, **screening** involves testing individuals across an apparently healthy population to identify those who have a cancer, but do not yet have symptoms.[36,37]

The strategies used for early detection vary according on the type of cancer and may include clinical examination, diagnostic imaging, laboratory tests, endoscopic examination, or a combination of those procedures.[35,38] Research on early detection of cancer has shown that the established screening approaches for cervical, breast, and colorectal cancers, have been useful

to reduce the number of cases diagnosed at later stages and mortality.[35] CDC also supports screening for lung cancer.[39] However, CDC does not recommend screening for other types of cancer, such as ovarian pancreatic, and prostate cancer due to screening has not been shown to reduce deaths. It is important to highlight that in Puerto Rico, the most common types of cancer are those with supported screening approaches – breast, colon, cervix but also prostate cancer (pp.13-14). A summary of the current cancer screening guidelines for individuals at average risk from the American Cancer Society (ACS), the United States Preventive Services Taskforce (USPSTF) and the American College of Obstetrics and Gynecology (ACOG) for some of the cancers with supported screening approaches are available in Annex III: Complementary tables and figures (pp. 69). However, in addition to the balance between the benefits and harms of screening, there are other challenges to take in count to achieve early detection of cancer.

Challenges for early cancer detection



Source: Crosby D, Bhatia S, Brindle KM, et al. Early detection of cancer. Science 2022;375:eaay9040.

Cancer screening is one of the most effective ways to reduce the burden of cancer at the population level.[40] However, this approach is not exempt of disparities (i.e., limited access to clinical facilities among those who live in remote areas, cultural beliefs, lack of knowledge about cancer screening, lack of follow-up exams).

Early Detection of Cancer in Puerto Rico

Data from the BRFSS reflected variations in screening for different types of cancer in Puerto Rico.[41] For the of Papanicolaou (Pap) test used for cervical screening, it was observed a slight increase in women aged 21-65 that reported have had a Pap smear within the last three years in Puerto Rico (2020: 79.3% vs. 2012: 77.0%) and it was also slightly greater when compared to the U.S. (2020: PR 79.3% vs. US 77.7%). In regards of mammogram screening for breast cancer, it was observed a slightly decrease in women aged 40 and older that reported having had a mammography within the last two years in Puerto Rico (2022: 75.6% vs. 77.5%) even when it is higher than the U.S. (2022: PR 75.6% vs. US 70.2%). However, the mammogram screening among women aged 50 and older was increasing in Puerto Rico (2022: 84.2% vs. 79.3%) and was higher than the observed for the U.S. (2022: PR 84.2% vs. US 76.3%). Respect to colonoscopy and sigmoidoscopy screening for colorectal cancer, it was increasing in Puerto Rico (2018: 52.3% vs. 2012: 47.2%) but this increase is still lower than the U.S. (2018: PR 52.3% vs. US 66.2%). BFRSS measures for fecal occult blood test (FOBT), another screening test for colorectal cancer, changed the age range respect to the one used as reference in the previous PRCCC Plan. Nevertheless, 2022 data showed a substantially higher prevalence for Puerto Rico

compared to U.S. (27.3% vs. 5.7%). In terms of prostate-specific antigen (PSA) screening for prostate cancer, it was observed a significant decrease in men aged 40 and older that reported have had a PSA within the last two years in Puerto Rico (2020: 56.4% vs. 76.8%) even when it is still higher than the U.S. (2020: PR 56.4% vs. US 31.8%).

Cancer screening in U.S. and Puerto Rico, BRFSS

Screening Test	2012		2022	
	U.S. (Md %)	PR (%)	U.S. (Md %)	PR (%)
Pap test:				
21-65 yrs. /≤3 yrs.	85.0%	77.0%↓	77.7%[b]	79.3%[b]↑
18+yrs. /≤3 yrs.	78.0%	71.0%↓	---	---
Mammography:				
40+ yrs. /≤2 yrs.	74.0%	77.5%↑	70.2%	75.6%↑
50+ yrs. /≤2 yrs.	77.0%	79.3%↑	76.3%	84.2%↑
Colonoscopy/ sigmoidoscopy[a]	67.3%	47.2%↓	66.2%[a]	52.3%[a]↓
Fecal occult blood test (FOBT):				
50+ yrs./last 2 yrs.	14.2%	26.4%↑	---	---
45-75 yrs./last yr.	---	---	5.7%	27.3%↑
Prostate-specific antigen (PSA):				
40+ yrs./last 2 yrs.	45.2%	76.8%↑	31.8%[b]	56.4%[b]↑

[a] data available was from 2018; 2020. --- data not available.
Source: BRFSS (https://www.cdc.gov/brfss/brfssprevalence/).

The following are cancers with supported screening that were selected to be prioritized during the next years to reduce their occurrence and thus improve cancer control in Puerto Rico. For each type of cancer, objectives, prevention measures, and strategic actions were delineated.

Breast Cancer

Breast cancer is the most common type of cancer among women in Puerto Rico in terms of incidence but also mortality (see pp. 12-13). During the period 2016 – 2020, female breast cancer accounted for 30.5% and 18.6% of all cancers' incidence and deaths, respectively among women of different age groups (see Annex III – Complementary tables and figures pp. 69).[16] However, the 5-year relative survival rate among those diagnosed between 2012 and 2016 was 86.8%. Specific risk factors that have been related to female breast cancer are: genetic, lifestyles, and exposure to hormones. The best method for early detection is mammography.

Objective No. 1: By 2030, increase the percent of women 40 years and older who have had a mammogram in the last two years.		
Measure	**Baseline (year)**	**Target 2030**
Women 40 and older who have had a mammogram in the last two years.	75.6% (2022)	80.3%

Source: BRFSS (https://www.cdc.gov/brfss/brfssprevalence/); Healthy People 2030.
Note. The target is based on the Healthy People 2030.

Objective No. 2: By 2030, increase the percent of women 40 and older who are in health disparity due to not having a health insurance who have had a mammogram in the last two years.		
Measure	**Baseline (year)**	**Target 2030**
Women 40 and older who have no health insurance who have mammogram in the last two years.	42.9% (2020) 37.1% (2022)	40.8%

Source: Serrano-Rodríguez RA, Rodríguez-Alamo N. Cancer-Related Risk Factors, Puerto Rico 2016-2020. May 2023. Puerto Rico Behavioral Risk Factor Surveillance System, Puerto Rico Department of Health; PR-BRFSS, 2024 (not published).
Note. The target is based on 10% of improvement.

Objective No. 3: By 2030, decrease the percent of late-stage disease of female breast cancer for women 40-74 years who have been diagnosed with breast cancer.		
Measure	**Baseline (year)**	**Target 2030**
Women 40 - 74 with late-stage breast cancer.	35.5% (2010-2019) 35.0% (2010-2021)	34.5%

Source: PRCCR.
Note. The target is based on a recommendation of the working group.

Strategic actions:

1. Promote professional development of physician and other health providers regarding the updated clinical guidelines for breast cancer screening, follow-up, and early diagnosis, including the use of breast cancer risk assessment tool (online calculator) such as https://bcrisktool.cancer.gov/.
2. Partner with government agencies (e.g., PRDOH), clinical facilities (e.g., Centers 330) and community organizations to:
    a. organize activities during October (Breast Cancer Awareness Month Proclamation).
    b. promote public awareness and outreach on breast cancer screening and importance to follow the recommended guidelines among women, especially those who are never or rarely screened, have familiar history of cancer or live at rural communities (e.g., mobile units).
    c. conduct provider and community assessments to identify barriers for women to receive screenings, including barriers experienced during the recent ecological events experienced in Puerto Rico.
    d. promote the use of EBIs to educate women on breast cancer (i.e., modifiable risk factors, screening, and early diagnosis).
    e. advocate for breast cancer screening and early detection programs among women who have no health insurance.
    f. promote the development and integration of interactive web tools that patients and their families can access for free to learn about their screening options and other important information.
    g. promote work-site wellness initiatives and policies at public and private settings that facilitate breast cancer prevention and screening efforts.
3. Promote community education and awareness through massive campaigns and social media messages with information about indications, importance of mammogram and how to overcome barriers for screening.
    a. Enhance screening promotion among women in the subgroups that showed the greatest percentages of not having a mammogram within the past two years (40-45 years and those 65 and over) and those with a genetic predisposition.
4. Promote the implementation of patient navigation programs among the healthcare systems.
5. Promote the use of electronic health records (EHR) data to identify risk population.

6. Educate and promote awareness of hereditary breast cancer and the use of genetic testing.
7. Promote among primary physicians the use of risk evaluation tools.

Cervical Cancer

Cervical cancer is among the top incidence and mortality cancer sites, especially observed in women on the younger age groups (see Annex III – Complementary tables and figures pp. 69).[16] During the period 2016 – 2020, cervical cancer accounted 2.8% of all cancers in women and 2.0% of all cancer deaths. The 5-year relative survival rate for those diagnosed between 2012 – 2016 was 67.6%. The main risk factor for cervical cancer is HPV; other factors linked include: sexual history (e.g., several sexual partners), prolonged use of oral contraceptives, history of cigarette smoking, low socioeconomic status, and a diet deficient in fruits and vegetables. The best screening tests for cervical cancer are the Pap test and the HPV test.

Objective No. 4: By 2030, increase the percent of women 21-65 years who have had a recent cervical cancer screening.

Measure	Baseline (year)	Target 2030
Women 21-65 years who have had a recent cervical cancer screening (including a Pap test during the past three years).	79.3% (2020) 72.9% (2022)	80.0%

Source: BRFSS (https://www.cdc.gov/brfss/brfssprevalence/); PR-BRFSS, 2024 not published; Healthy People 2030.
Note. According to the Healthy People 2030 recommendation (79.2%), Puerto Rico met the target in 2020. However, in 2022 this percentage decreased to 72.9%. Due to this, the new target will be kept in 80.0%.

Objective No. 5: By 2030, increase the percent of women 21-65 years who are in health disparity due to not having a health insurance who have had a cervical cancer screening.

Measure	Baseline (year)	Target 2030
Women 21-65 years with no health insurance who have had a recent cervical cancer screening (including a Pap test during the past three years).	75.2% (2020)	79.2%

Source: Serrano-Rodríguez RA, Rodríguez-Alamo N. Cancer-Related Risk Factors, Puerto Rico 2016-2020. May 2023. Puerto Rico Behavioral Risk Factor Surveillance System, Puerto Rico Department of Health; Healthy People 2030.
Note. The target is based on the Healthy People 2030.

Strategic actions:

1. Promote professional development of physicians and other health providers regarding the updated clinical guidelines for cervical cancer screening, follow-up, and early diagnosis. Also, promote continuing education on other procedures that assist in the early detection of cervical cancer (i.e., colposcopy, excisional biopsies).
2. Promote the use of co-testing (Pap-test and hrHPV testing) among healthcare providers.
3. Partner with government agencies, clinical facilities, and community organizations (e.g., PRDOH, Centers 330) to:
    a. organize activities during January (Cervical Cancer Awareness Month Proclamation) and August (Human Papillomavirus Awareness and Prevention Week Proclamation).
    b. promote public awareness and outreach on cervical cancer screening, its links with HPV, and the importance to follow the recommended guidelines among women, especially those aged 21 to 64, who are never or rarely screened or that live at rural communities.

c. conduct provider and community assessments to identify barriers for women to receive screenings, including barriers experienced during the recent ecological events experienced in Puerto Rico.
d. promote the use of EBIs to educate women on cervical cancer (i.e., modifiable risk factors, screening, early diagnosis, and HPV vaccination).
e. advocate for cervical cancer screening and early detection programs among women who have no health insurance.
f. promote the development and integration of interactive web tools that patients and their families can access for free to learn about their screening options and other important information.

4. Promote community education and awareness through massive campaigns and social media messages with information about indications, importance of cervical cancer prevention through screening and early diagnosis.
    a. Enhance screening promotion among women in the subgroup that showed the greatest percents of not receiving a pap test within the past 3 years (21-25 years).
5. Promote the implementation of patient navigation programs among the healthcare systems.
6. Promote that primary physicians perform cervical cancer screening and stay updated on new technologies (e.g., FDA approved self-tests for cervical cancer).

Colorectal Cancer

Colorectal cancer is the second most common type of cancer among men and women in Puerto Rico in terms of incidence but also mortality (see pp12-13).[16] During the period 2016 – 2020, colorectal cancer accounted for 11.5% of all cancers in men and 10.5% of all cancers in women (see Annex III – Complementary tables and figures pp. 69). It also accounted for 13.3% of all cancer deaths in men and 12.7% of all cancer deaths in women. However, the risk of developing colorectal cancer was 1.4 times higher in men than women (95% CI: 1.3, 1.5); whereas the risk of dying from colorectal cancer was 1.6 times higher in men than women (95% CI: 1.5, 1.8). The 5-year relative survival rate for colorectal cancer among those diagnosed between 2012 – 2016 was 64.5%. Specific risk factors linked to colorectal cancer are: family history of polyps, ulcerative colitis, Crohn's disease, a diet high in fat and calories and low in fruits and vegetables, cigarette smoking, and physical inactivity. Among the tests for the early detection of colorectal cancer are fecal tests and colonoscopy or CT colonography.

Objective No. 6: By 2030, increase the percent of individuals 45-75 years who have fully met the United States Preventive Services Task Force (USPSTF) recommendations.

Measure	Baseline (year)	Target 2030
Adults aged 45-75 years who have fully met the USPSTF recommendations.	55.5% (2022)	68.3%

Source: BRFSS (https://www.cdc.gov/brfss/brfssprevalence/); Healthy People 2030.
Note. The target is based on the Healthy People 2030.

Objective No. 7: By 2030, increase the percent of uninsured individuals 45-75 years who have fully met the United States Preventive Services Task Force (USPSTF) recommendations.		
Measure	**Baseline (year)**	**Target 2030**
Adults aged 45-75 uninsured individuals who have fully met the United States Preventive Services Task Force (USPSTF) recommendations.	TBD	TBD

TBD: To be determined.
Source: PR-BRFSS

.**Strategic actions:**

1. Promote professional development of physicians and other health providers regarding the updated clinical guidelines for colorectal cancer screening, follow-up, and early diagnosis.
2. Encourage cancer screening referrals by primary physicians.
3. Partner with government agencies, clinical facilities and community organizations (e.g., PRDOH, Centers 330) to:
    a. organize activities during March (Colorectal Cancer Awareness Month Proclamation).
    b. promote public awareness and outreach on colorectal cancer screening, and the importance of following the recommended guidelines, especially those that are never or rarely screened or that live in rural communities.
    c. conduct provider and community assessments to identify barriers to receive screenings, including barriers experienced during the recent ecological events experienced in Puerto Rico.
    d. promote the use of EBIs to educate the population on colorectal cancer (i.e., modifiable risk factors, screening, and early diagnosis).
    e. advocate for colorectal cancer screening and early detection programs for those uninsured.
    f. promote the development and integration of interactive web tools that patients and their families can access for free to learn about their screening options and other important information (e.g., colorectal cancer screening decision aid tool used in the VA Caribbean Healthcare System).
4. Promote community education and awareness through massive campaigns and social media messages with information about colorectal cancer prevention through screening and early diagnosis, including those with a genetic predisposition.
5. Promote the implementation of patient navigation programs among the healthcare systems.
6. Educate and promote awareness of hereditary colorectal cancer and use of genetic testing.

Prostate Cancer

Prostate cancer is the most common type of cancer among men in Puerto Rico in terms of incidence but also mortality (see pp12-13).[16] During the period 2016 – 2020, prostate cancer accounted for 38.3% of all cancers in men and 16.2% of all cancer deaths in men (see Annex III – Complementary tables and figures pp. 69). The 5-year relative survival rate for those diagnosed between 2012 – 2016 was 99.7%. Prostate cancer can be detected in its early stages by the PSA test but also the digital rectal exam (DRE). Specific risk factors related to prostate cancer are: age (>45 years), having a family history of prostate cancer, a history of high-grade intraepithelial neoplasia, and a diet rich in animal fat or meat.

Objective No. 8: By 2030, increase the percent of men 40 years and older who have done a PSA test within the last two years.		
Measure	**Baseline (year)**	**Target 2030**
Men 40 years and older who have done a PSA test within the last two years.	56.4% (2020)	59.2%

Source: BRFSS (https://www.cdc.gov/brfss/brfssprevalence/).
Note. The target is based on 5% of improvement.

Strategic actions:

1. Collaborate with PR-BRFSS to:
    a. continue gathering information regarding the percent of men 40 years and older who have talked with healthcare providers about PSA advantages and disadvantages.
    b. develop a question regarding informed decision making on prostate cancer screening to include in data surveillance systems.
2. Encourage physician and other health providers to educate male patients about prostate cancer prevention, benefits and risks of the PSA screening test as well as risk factors.
3. Promote professional development of physicians and other health providers on prostate cancer screening guidelines.
4. Partner with government agencies (e.g., PRDOH), clinical facilities (e.g., Centers 330) and community organizations to:
    a. organize activities during September (Prostate Cancer Awareness Month Proclamation).
    b. promote public awareness and outreach on prostate cancer screening, especially among men that are never or rarely screened or that live at rural communities.
    c. conduct provider and community assessments to identify barriers to receive screenings, including barriers experienced during the recent ecological events experienced in Puerto Rico.
    d. promote the use of EBIs to educate men on prostate cancer (i.e., risk factors, screening, and early diagnosis).
    e. advocate for prostate cancer screening and early detection programs among those without health insurance.
    f. promote the development and integration of interactive web tools that patients and their families can access for free to learn about their screening options and other important information.
5. Promote community education and awareness through massive campaigns and social media messages with information about indications, importance of prostate cancer prevention through screening and early diagnosis.
    a. Enhance screening among the subgroups that presented the higher percents of not having done a PSA test within the last two years (40 – 49 and 50 – 59 years).
6. Promote the implementation of patient navigation programs among the healthcare systems.

Lung and Bronchus Cancer

Lung and bronchus cancer is the third most common type of cancer among men in Puerto Rico and the fifth in women in terms of incidence; and the third cause of death in both sexes.[16] During the period 2016 – 2020, lung and bronchus cancer accounted for 5.4% of all cancers in men and 4.0% of all cancer deaths in men (see Annex III – Complementary tables and figures pp. 69). The risk of developing lung and bronchus cancer was 1.8 times higher in men than women (95% CI: 1.7, 2.0). The 5-year relative survival rate for those diagnosed between 2012 – 2016 was 22.6%. The specific risk factors are: tobacco consumption, smoking cigars/pipes, secondhand smoke, exposure to environmental carcinogens, other lung diseases (e.g., tuberculosis), and family history.

Objective No. 9: By 2030, increase the percent of persons aged 50-80 and former smokers who have done a CAT/CT scan in the last year.		
Measure	**Baseline (year)**	**Target 2030**
Persons aged 50-80 who are current and former smokers who had CAT/CT scan in last year.	5.4% (2022)	7.5%

Source: BRFSS (https://www.cdc.gov/brfss/brfssprevalence/).
Note. The target is based on the Healthy People 2030.

Strategic actions:

1. Collaborate with PR-BRFSS to:
    a. continue gathering information regarding lung and bronchus cancer screening.
    b. develop additional questions/module.
2. Encourage physicians and other health providers to talk about lung and bronchus cancer as well as risk factors (i.e., tobacco use) and screening benefits and risks.
3. Promote professional development of physicians and other health providers on lung cancer screening guidelines.
4. Partner with government agencies, clinical facilities and community organizations (e.g., PRDOH, Centers 330).
5. Promote the implementation of patient navigation programs among the healthcare systems.
6. Educate and promote genetic testing.
7. Promote use the EHR to identify risk population.

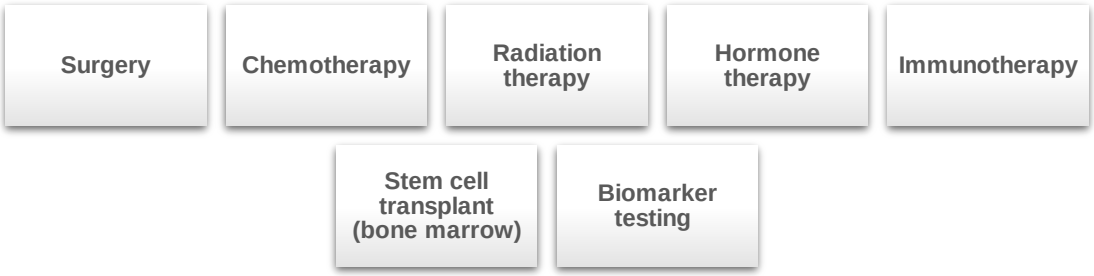
Treatment

GOAL Increase availability and quality of cancer care programs.

After cancer detection and diagnosis, additional tests and evaluations are used to measure the spread of cancer from its origin and to provide a **stage at diagnosis**.[42,43] For example, the CDC uses the staging system called *Summary Stage*, which characterizes invasive cancers as localized (confined to the primary site), regional (spread directly beyond the primary site or to regional lymph nodes), or distant (spread to other organs or remote lymph nodes).[42] It is also possible to have some cancers not staged because this data is unknown or unspecified. Another staging system widely used is the one developed by the American Joint Committee on Cancer.[44]

Cancer treatment is defined as the use of surgery, radiation, medications, or other therapies with the goal of curing, shrinking, or stopping the progression of cancer.[45] There are many types of cancer treatments. The decision to use one or various cancer treatments is based on a discussion between the provider and the patient, according to the patient's circumstances, disease stage, and treatment goals.[46,47] Clinical trials are a treatment option for patients. Access to timely and appropriate cancer treatment and care is crucial to enhance the survival and quality of life of cancer patients.[43]

Common types of cancer treatment



Source: Centers for Disease Control and Prevention, 2023f; National Cancer Institute, no date.

Goals of cancer treatments

The goals of cancer treatment can vary depending on the type and stage of cancer, as well as the patient's overall health and preferences. Here are the primary goals[45,48]:

1. **Cure:** The goal is to completely eradicate cancer, allowing the patient to live a normal life span. This is often referred to as treatment with curative intent.
2. **Control:** If a cure is not possible, the aim is to control the disease. This involves shrinking tumors, slowing the growth of cancer cells, and preventing the spread of cancer. This can help prolong life and improve quality of life.
3. **Palliation:** When cancer is advanced and cannot be controlled, the goal shifts to palliative care. This focuses on relieving symptoms and improving the patient's comfort and quality of life.
4. **Primary Treatment:** This is the main treatment used to remove or kill cancer cells. Surgery is often the primary treatment for many cancers, but it can also include radiation therapy or chemotherapy.
5. **Adjuvant Treatment:** This is additional treatment given after the primary treatment to eliminate any remaining cancer cells and reduce the risk of recurrence. Common adjuvant therapies include chemotherapy, radiation therapy, and hormone therapy.
6. **Neoadjuvant Treatment:** This is treatment given before the primary treatment to shrink a tumor, making it easier to remove or treat effectively.

Each patient's treatment plan is unique and tailored to their specific situation. It's important to discuss these goals with the healthcare team to understand the best approach for each individual case.[45]

A key determinant of outcomes in cancer treatment is the time elapsed between a formal cancer diagnosis and initiation of treatment, also known as **treatment delay** or **time-to-treatment**.[49] Access to **standard-of-care (SOC)** treatments is essential to comprehensive cancer care. There are other important factors that may influence the outcomes of cancer treatment such as those related to patients (e.g., demographic, psychological, social, cultural, financial), healthcare provider and system (e.g., access, policy, delivery, healthcare workforce, infrastructure available) and disease (e.g., cancer site, size and growth rate) that should be addressed too.[40,43,49] The Commission on Cancer of the American College of Surgeons seeks to improve survival and the

quality of life for cancer patients focusing on setting and raising standards of cancer care.[50] They accredit cancer programs that meet rigorous standards for quality cancer care.

Clinical trials have become an alternative treatment strategy offered to patients. These studies are essential to bring new advances in cancer treatment to improve survival and quality of life of patients.[40] These are medical research studies in which cancer patients may volunteer to take part.[51] However, a report from the American Association for Cancer Research pointed out that enrollment in cancer clinical trials is extremely low especially among minority groups.[40] Community outreach and patient navigation programs can serve as tools to enhance participation in clinical trials. A **patient navigator program** is an innovative approach that provides whole-patient care through intensive case management.[52] Professionals trained as patient navigators work one-on-one with patients to encourage continued commitment and adherence to medical treatments, provide access to social services, improve communication with the healthcare team, address disparities and prompt re-engagement in care.

Cancer Treatment in Puerto Rico

In Puerto Rico, over 90% of the population has access to health insurance, of which almost half (46.9%), are eligible due to their income level and medical needs. These are covered by the Government Health Insurance Plan (GHIP) through the federal programs – Medicaid or the Medicare-expansion Children's Health Insurance Program (CHIP) to children under age 19.[53–55] GHIP uses a managed care delivery system to provide acute, primary, specialty, and behavioral health services. Its beneficiaries have the option to enroll into any of the managed care plans contracted by the "Administración de Seguros Salud de Puerto Rico (ASES, by its Spanish acronym)" to provide island wide medical services.[53,56] However, there are documented disparities in Puerto Rico with respect to health insurance coverage. One study from Chance and collaborators,[57] found underuse of postoperative radiation therapy after breast conservation surgery in women with stage I or II invasive breast cancer treated in Puerto Rico. Patients enrolled in Medicare (OR: 2.14; 95%CI: 1.46 to 3.13; p< .01) and those with dual enrollment (Medicaid and Medicare) (OR: 1.61; 95% CI: 1.14 to 2.27; p < .01) were more likely to receive postoperative radiation therapy compared with patients with Medicaid alone. In addition, this study identified significant geographic variations. Additional data on other studies is available in the section *Social Determinants of Health in Cancer Care* (pp .55).

Other factors affecting cancer treatment and care in Puerto Rico include access to cancer services, health literacy, number of healthcare workforce available and disruptions to continue oncology care related to the major public health emergencies experienced since 2017 (see sections *Social Determinants of Health in Cancer Care* pp. 55 and *Cancer Related to Environmental and Occupational Exposures* pp. 59).

According to the NIH, the Hispanic/Latino representation in NCI-funded clinical trials is less than 10%, showing the gap in achieving an equitable participation of these underrepresented groups in cancer research that may help to find ways to prevent, diagnose, and treat cancer.[58] A study that assessed the factors influencing the participation in clinical trials among a sample of breast cancer survivors in Puerto Rico through focus groups, found that 41.2% have heard about clinical trials, 32.4% have been invited to participate, and 6 out of 10 indicated a willingness to participate in future clinical trials. In addition, participants showed a basic knowledge and understanding of clinical trials.[59] Among the motivations to participate in clinical trials were: desire to help others, non-monetary incentives received, self-benefits, readiness to participate based on the phases of illness, and enhanced relationships with the clinical trial recruitment team. Among the concerns

expressed were limited knowledge about trial procedures and results, lack of transportation, childcare, and support from the family.

The following are objectives and strategies to continue promoting a timely and adequate access to quality cancer treatments in Puerto Rico.

Treatment Summary Plan

The National Academy of Medicine (previously known as the Institute of Medicine) has recommended the development of patient-centered cancer treatment plans to improve the quality of cancer care.[60] These plans are designed to ensure that patients receive coordinated, patient-centered care throughout their cancer journey. They help improve communication between the patient and the healthcare teams.

Objective No. 1: By 2030, increase the percent of cancer patients who received a treatment summary plan.		
Measure	**Baseline (year)**	**Target 2030**
Number of cancer patients who received a treatment summary plan.	59.6% (2022)	62.6%

Source: Serrano-Rodríguez RA, Rodríguez-Alamo N. Insights into Cancer Survivorship: 2022 Data Report. February 2024. Puerto Rico Behavioral Risk Factor Surveillance System, Puerto Rico Department of Health.
Note. The target is based on 5% of improvement.

Strategic actions:

1. Advocate for the proactive delivery of cancer treatment plans to patients by their healthcare teams.
2. Educate primary care physicians and specialists (Hematologist, Oncologist, and others) about the importance of providing and discussing treatment plans with cancer patients in each visit.
3. Educate patients about the importance of having a treatment plan and discuss it with their provider in each visit.
4. Engage patient navigators and care coordinators to assist patients in having access to their individual cancer treatment plan.
5. Collaborate with local cancer groups and organizations to increase the level of health literacy of cancer patients related to their disease.

Access to Treatment

In a systematic review and meta-analysis published in the British Medical Journal, the authors found that even a four-week delay in cancer treatment (surgery, radiotherapy, and systemic treatment modalities) was associated with increased mortality.[61] Since timely access to cancer treatment is critical to positive clinical outcomes, identifying the barriers that cancer patients and health care face becomes an imperative objective towards reducing or eliminating these factors. There are only a few publications about these factors in Puerto Rico. In a recent study, patients reported several factors that represent barriers to access to cancer care including financial, health insurance, communication, among others.[62] As expected, access to cancer care is also impacted by natural disasters. In a recent publication,[63] the investigators found that cancer survivors in Puerto Rico faced increased barriers in accessing medical care after Hurricane Maria.

Objective No. 2: By 2030, identify at least one (1) barrier affecting patients, providers, and infrastructure to access or continue cancer care and establish actions to reduce them (including the experiences lived during recent public health emergencies).		
Measure	**Baseline (year)**	**Target 2030**
Number of barriers identified affecting patients, providers, and infrastructure to access or continue cancer care	TBD	TBD
Number of actions established to reduce barriers (patient, providers, infrastructure) to access or continue cancer care	TBD	TBD

TBD: To be determined.
Potential source: PR-BRFSS; PRCCR.

Strategic actions:

1. Collaborate with PR-BRFSS and/or government agencies (e.g., PRDOH) and clinical facilities (e.g., Centers 330) to:
    a. develop additional questions or modules to gather information regarding barriers (e.g., timely treatment, access to a specialist/subspecialist) and actions taken to continue cancer care from three perspectives (patients, providers, infrastructure).
    b. distribute educational materials to patients and their families (e.g., emergency preparedness plan that contains information tailored for cancer patients).
    c. educate patients through physicians and other healthcare providers (i.e., health educators) on treatment alternatives including a customized treatment care plan and importance of making informed decisions (empowerment).
2. Promote the use of telemedicine, decentralized care and the use of new technologies such as molecular tests, medications, and novel therapies.
3. Advocate for the revision of Law No. 79 of 2020 *"Ley Especial para Asegurar el Acceso al Tratamiento y Diagnóstico de los Pacientes de Cáncer en Puerto Rico*" so that it is updated to include new technologies.
4. Promote training and continuing education to physicians and other healthcare providers in topics such as emergency preparedness, continuity of cancer care, and new technologies.
5. Advocate for parity in payments to healthcare providers.
6. Partner with healthcare organizations, government, and community-based organizations to reduce barriers to access cancer treatment and care (including health insurance pre-authorizations, communication with providers, and financial issues).

Patient Assistant and Navigation Programs

Patient assistance programs play an important role in cancer treatment for several reasons: financial support for expensive treatments, access to medications, support services, educational resources, and counseling.

Objective No. 3: By 2030, increase the percent of clinical facilities that provide information about patient assistance programs and resources.		
Measure	**Baseline (year)**	**Target 2030**
Number of clinical facilities that provide information about patient assistance programs and resources.	TBD	TBD

TBD: To be determined.
Potential source: PRCCCP, PRCCR.

Strategic actions:

1. Conduct a survey to identify the clinical facilities that currently provide cancer patients with information about patient assistance programs.
2. Partner with hospitals, clinical facilities, health insurance, industry, and not-for-profit organizations to:
    a. gather data on patient assistance programs and resources for patients, their caregivers and families, and assess how many of them are doing it as part of their practice.
    b. educate patients and healthcare providers on these assistance programs, their resources, and benefits (e.g., discounts, timely access to treatment, referrals/connection to specialists).
3. Promote the distribution of educational materials with information about patient assistance programs and resources available and/or have the information in a patient-friendly webpage or mobile application.
4. Develop programs that focus on supporting cancer patients with their physical and mental health.

Studies have demonstrated that patient navigation programs improve access to care and optimize treatment outcomes.[64] They impact treatment initiation, adherence, quality of care, and patient satisfaction. In fact, in 2023, the Centers for Medicare and Medicaid Services (CMS) announced their decision to reimburse patient navigation services for cancer patients. Thus, the availability of patient navigation programs must be included in any cancer control and care plan. Unfortunately, there is only one abstract publication about one cancer patient navigation program in Puerto Rico, so there is very limited information available.[65]

Objective No. 4: By 2030, increase the percent of patients enrolled in patient navigation programs that assist them with services and barriers for timely diagnosis, treatment, and recovery.		
Measure	**Baseline (year)**	**Target 2030**
Patients enrolled in patient navigation programs that assist them with services and barriers for timely diagnosis, treatment, and recovery.	TBD	TBD

TBD: To be determined.
Potential source: PRCCCP, PRCCR.

Strategic actions:

1. Partner with hospitals, health insurances, and other clinical facilities to gather data on patients enrolled in patient navigation programs.
2. Advocate for adequate and consistent funding for patient navigation programs at clinical facilities.
3. Promote the establishment of patient navigation programs for the most common types of cancers in Puerto Rico (i.e., prostate, breast, colorecta, lung) at clinical facilities.
4. Promote orientations on patient navigation programs at clinical facilities.
5. Develop and implement a data collection plan for patient navigation programs.
6. Promote continued education to healthcare providers on patient navigation and workforce diversity.

Facilities

The three current cancer treatment accredited facilities are: 1) Hospital Oncológico Dr. Isaac González-Martínez (accredited since 1952, located in Metro health region), 2) Hospital Pavia Caguas (before HIMA•San Pablo Oncology Hospital, located in Humacao health region) and 3) VA Caribbean Healthcare System (located in Metro health region). The hospital of the UPRCCC (operating since 2018) is also in the process of obtaining accreditation. An increase in the number of facilities with this accreditation should result in improved quality and more consistent care for

cancer patients. In addition, the accreditation process helps enhance the organization and coordination of cancer programs, leading to more efficient and effective care delivery.[66]

Objective No. 5: By 2030, increase the number of cancer treatment centers accredited by the American College of Surgeons, Commission on Cancer (CoC) to increase the number of patients that receive care at CoC accredited facilities and affiliated centers.		
Measure	**Baseline (year)**	**Target 2030**
Number of cancer treatment facilities accredited by CoC to increase the number of patients that receive care at CoC accredited facilities and affiliated centers.	3 (2023)	5

Source: American College of Surgeons' Commission on Cancer (2024); PRCCCP.
Note. The proposed target for 2030 is five facilities.

Strategic actions:

1. Promote education and encourage non-accredited facilities in and outside the Metro health region to comply with national practice standards of care (SOC) of the CoC and apply for accreditation.
2. Promote and emphasize care delivery at CoC accredited hospitals/ centers to maintain their accreditation.
3. Support partnerships of non-accredited facilities with accredited hospitals/ centers to foster collaborations, increase services provided and compliance with national SOC.
4. Deliver training and/or boosters CoC guidelines to physicians and other oncology healthcare providers (e.g., nurses, navigators, supporting staff).
5. Monitor, track, and evaluate the implementation of the CoC guidelines.
6. Promote the integration and participation of CoC accredited hospitals/ centers in quality improvement programs.
7. Partner with CoC accredited facilities and affiliated centers to gather data on the number of patients receiving cancer care. After getting preliminary data, determine a baseline target.
8. Advocate for free or low-cost transportation and/or housing options for patients and their caregivers.
9. Promote the use of EBIs on cancer care for patients at their facilities.
10. Conduct patients need assessments and satisfaction assessments.

There has been a steady decline in the availability of healthcare professionals in Puerto Rico for more than a decade.[66] One of the key drivers for this decline is the migration from Puerto Rico to the United States.[67] However, there is no published study on the statistics of cancer care professionals who are actively practicing in Puerto Rico and how this has changed over the last several years. If these professionals follow similar trends as the general healthcare group, this will negatively impact cancer patients.

Objective No. 6: By 2030, reduce the turnover of healthcare professionals who manage cancer patients (e.g., oncology physicians, oncology-certified registered nurses, nurses, patient navigators).		
Measure	**Baseline (year)**	**Target 2030**
*Percent of turnover of healthcare professionals who manage cancer patients (e.g., physicians, oncology **registered** nurses, nurses, patient navigators).*	TBD	TBD

TBD: To be determined.
Potential source: CoC; PRCCCP, PRCCR.

Strategic actions:

1. Partner with CoC accredited facilities, clinical centers, and the Puerto Rico Institute of Statistics to gather data on the turnover of healthcare providers (e.g., oncology physicians, oncology-certified registered nurses, nurses, patient navigators).
2. Advocate for parity in payments to physicians (MDs, Medicare) and improvement of salary conditions for other healthcare providers (e.g. special incentives, productivity bonuses).
3. Advocate for Increasing the recruitment of healthcare providers at clinical facilities and strategies for retention [e.g., offering free continuing education units (CEUs)].
4. Advocate for new medical residencies, updated education programs at academic institutions and processes to obtain their licenses, credentials, and certifications.
5. Promote initiatives such as internships or advanced practice programs at clinical facilities.

Participation in Clinical Trials

Objective No. 7: By 2030, increase the percent of participation and retention of cancer patients in clinical trials.		
Measure	**Baseline (year)**	**Target 2030**
Cancer patients participating in clinical trials (as part of their cancer treatment).	8.4% (2021)	10.0%

Source: PR-BRFSS – Cancer Survivorship module 2021; The Cancer Letter. Participation by minority racial, ethnic groups in NCI-funded trials nearly doubles in 20 years. 2020 Jun 26; 46(26).
Note. Based on NIH data, the target is 10.0%. The UPRCCC is working towards obtaining the National Cancer Institute's Designated Cancer Center designation and recently incorporated the All of Us program, which will increase patient participation in clinical trials. Nonetheless, there is awareness of the possibility of an overestimation of patients in clinical trials since the survivorship module of the PR-BRFSS uses "clinical study" as part of the question. This could be interpreted as any imaging or other study for clinical evaluations. Thus, it is important to work towards the clarification and specificity of this question.

Strategic actions:

1. Continue implementing the cancer survivorship module of the PR-BRFSS to gather data on cancer patients participating in clinical trials (var label: CSRVCLIN).
2. Partner with hospitals, other clinical facilities, and research centers to provide information to the PRCCCP regarding patients participating in or referred to clinical trials.
3. Continue promoting education and public awareness on the benefits of participating in clinical trials and disseminate information of those actively recruitment.
4. Promote cancer patient enrollment in the NIH *All of Us* Research Program [webpage: https://www.joinallofus.org/PuertoRico/UPRCCC; email: allofus@cccupr.org; phone: (800) 981-0084] and other volunteer registries (e.g., Alliance volunteer registry).
5. Collaborate in developing a Spanish-language website where cancer patients can find information about ongoing cancer research and clinical trials in Puerto Rico.
6. Promote physician referrals of cancer patients to ongoing clinical trials.
7. Advocate for increasing the number of physician-scientists and continuing education on clinical and translational research and minority underserved populations.
    a. Development and/or promotion of courses and curriculums for them.
8. Promote the use of electronic health record systems and health information technologies as well as barriers (e.g., transportation) to support recruitment and retention of patients in cancer clinical trials.
9. Encourage researchers and agencies applying for funding to increase infrastructure resources necessary to deliver cancer treatment clinical trials and to expand geographic access of clinical trials (including the top 10 most prevalent cancers).
10. Convene a workgroup of all Puerto Rico's institutions offering cancer clinical trials to discuss collaborative plans and strategies for effective recruitment and retention of patients.
11. Promote community outreach activities to support enrollment in clinical trials and to disseminate results.

12. Expand the definition in participation of cancer patients in clinical trials beyond their enrollment to treatment trials by including additional indicators such as biorepository, registry, genetic, diagnostic, quality of life, and economic studies as recommended by the following publication from Unger and collaborators[68] based on Commission on Cancer Accreditation Data: https://ascopubs.org/doi/full/10.1200/JCO.23.01030.

Survivorship and Quality of Life

GOAL Assure cancer survivor quality of life in Puerto Rico.

In addition to monitoring cancer incidence and mortality, cancer survival is another important component of epidemiological surveillance.[16] **Cancer survivor** refers to someone who has ever been diagnosed with cancer,[69] including "people who have no signs of cancer after finishing treatment, people receiving extended treatment over a longer period of time to control cancer or reduce risk of its recurrence, and people with advanced cancer".[70]

In the United States, the number of cancer survivors continues increasing due to the growth and aging of the population and advances in early detection and treatment.[71] As of January 1st, 2022, there were more than 18 million cancer survivors compared to 13.7 million for the same date but a decade ago.[71,72] In addition, 53% of survivors were diagnosed within the past 10 years, 18% with ≥20 years ago and 67% at age of 65 years or older.[71] Whereas data from the U.S. Cancer Statistics Working Group revealed that the US 5-year relative survival for cancer for all cancers was 66.4%.[73] However, it is important to note that survival rates vary by type of cancer as well as the stage of detection, diagnosis, and treatment.[74]

Even when early detection of cancer can improve outcomes and survival,[35,36] cancer survivors must cope with several aspects such as the physical effects of cancer and its treatment, potential functional and cognitive impairments as well as other psychological and economic factors.[71] The survivorship experience also takes in count factors related to follow-up care , late effects of treatment, cancer recurrence, second cancers, quality of life as well as the inclusion of the family members, friends, and caregivers.[75] The Commission on Cancer of the American College of Surgeons promotes the establishment of survivorship programs that include as part of their offerings to patients, services such as[50] :

Treatment summaries	Survivorship care plans (SCP)	Screening programs for cancer recurrence	Screening for new cancers
Seminars to survivors	Rehabilitation services	Physical activity programs	Nutritional services
Psycological support and psychiatric services	Support groups	Formalized referrals to experts (e.g., fertility counseling)	Financial support services

Cancer Survivorship and Quality of Life in Puerto Rico

In Puerto Rico, according to data from the Puerto Rico Central Cancer Registry (PRCCR) for the period 2012 – 2016, the prevalence of cancer survivors in Puerto Rico was higher for prostate cancer (n=14,046) and female breast cancer (n=9,130), colorectal cancer (n=7,634), thyroid cancer (n=4,987), corpus and uterus NOS cancer (2.826) and lung and bronchus cancer (n=2,618).[16] Most of the cases were diagnosed at early (localized) stage for prostate cancer (10,158 out 14,046), female breast cancer (5,257 out of 9,130), thyroid cancer (3,819 out 4,987) and corpus and uterus NOS (1,855 out of 2,826). However, for pancreas, colorectal, and lung and bronchus cancers diagnoses were made at later stages. Additional data on the 1-, 3-, and 5-year estimates by specific cancer sites and tumor stage for the same period with a follow-up to 2019 is available in Annex III: Complementary tables and figures, pp. 69).

Research has been done in Puerto Rico regarding issues cancer survivors may cope with. For example, a study of Tirado-Gómez and collaborators (2016) that aimed to describe physical-activity levels and barriers in a sample of women that had finished their chemotherapy and/or radiotherapy for breast cancer, a highly prevalent cancer, found that 3 out of each 4 patients did not reported moderate or vigorous intensity activity and if they are invited to participate of an physical activity EBI, they prefer (72%) that be in group settings. They expressed that they would like to obtain more information about physical exercises, but few indicated having received any guidance or direction from healthcare providers regarding exercise activities and did not believe that adequate physical activity could help to prevent cancer. Another study among a sample of anal cancer survivors living in Puerto Rico assessed the impact of their cancer diagnosis and treatments on their quality of life using a standardized scale.[76] Findings showed that patients that also had HIV had a significantly lower quality of life when compared to those without HIV (58 vs. 75, $p<0.05$).). In addition, those that perceived that radiotherapy continues to affect their quality of life had lower median scores than those who did not in the physical (73 vs. 93), emotional (75 vs. 92), and social functional scales (67 vs. 100) ($p<0.05$) and had higher median scores for the scales of the symptoms of pain (33 vs 17) and insomnia (67 vs 33) ($p<0.05$). Similar results were obtained among those had a surgery – lower median scores in the role (75 vs 100) and cognitive (75 vs 100) functional scales, and higher median scores for the symptoms scales of pain (33 vs 17) and insomnia (67 vs 33) ($p<0.05$).

Aware of the importance of the survivorship programs in cancer care, the PRCCCP and the American Cancer Society developed **Survivorship Care Plans (SCPs)** with helpful information for patients, their families, and caregivers and monitoring post treatment care. The SCPs can be used or adapted at clinical facilities and community organizations. A copy of these plans is available in Annex IV: Resources (pp. 82).

Survivorship ≥ 5 Years

Objective No. 1: By 2030, increase the percent of cancer survivors living 5 years or longer after diagnosis.		
Measure	**Baseline (year)**	**Target 2030**
Cancer survivors living ≥5 years after diagnosis. *Breast cancer* *Cervical cancer* *Colorectal cancer* *Prostate cancer* *Lung cancer*	(2012-2016) 88.6% 67.6% 64.5% 99.7% 22.6%	66.2%

Source: Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry;. Healthy People 2030.
Note. The target is based on the Healthy People 2030.

Strategic actions:

1. Educate cancer survivors and its caregivers about the importance of preventive care visits after treatment completion to help them reduce or control the late or long-term effects of treatment (e.g., hearing loss, depression, insomnia), reduce cancer recurrence or complications, and keep healthy lifestyles.
2. Create a Directory of Resources for cancer survivors and their caregivers with external economic resources to supplement the costs of their cancer treatment as well as financial, legal, and community resources.
3. Develop coalitions and work on the available resources to assist the survivors in their re-integration to work (e.g., Puerto Rico Department of Labor, PRDOE sections of Cancer & Careers).
4. Develop a survivorship surveillance system for preventive and screening tests (e.g., mammography, PAP, PSA, colonoscopy) for (5) five years after first diagnosis or first encounter in which the patient was notified of cancer.

Survivorship Plan, Services and Resources

Objective No. 2: By 2030, increase the percent of cancer survivors who receive a survivorship care plan as a quality standard of care in oncology.		
Measure	**Baseline (year)**	**Target 2030**
Cancer survivors who receive a survivorship care plan (SCP) as quality standard of care in oncology.	TBD	TBD
Did any doctor, nurse, or other health professional ever give you a written summary of all the cancer treatments that you received?	59.6% (2021)	62.6%
Have you ever received instructions from a doctor, nurse, or other health professional about where you should return or who you should see for routine cancer check-ups after completing treatment for cancer?	81.4% (2021)	85.5%

TBD: To be determined.
Source: PR-BRFSS – Cancer Survivorship module.
Note. The targets are based on 5% of improvement.

Strategic actions:

1. Continue implementing the cancer survivorship module in the PR-BRFSS to gather data on the cancer survivors who receive a survivorship care plan (SCP) as quality standard of care in oncology and review/add additional questions.

2. Promote the use of flexible, updated, customized SCPs that take in count issues that may affect a patients' compliance (e.g., patients attending many facilities to get their diagnostic and cancer care, patients that live away of the facilities).
    a. Encourage facilities and organizations to disseminate SCPs templates in webpages and social media.
3. Assess physician's knowledge toward follow-up care for cancer survivors in a collaborative effort between physician associations and other partners, using SPARCCS (Survey of Physicians Attitudes Regarding the Care of Cancer Survivors).
4. Adopt the strategies and proposed interventions of the report titled "Improving Treatment Summary and Survivorship Care Plan Accessibility for Cancer Patients", conducted by FARO LLC from July 2023 to June 2024 in Puerto Rico[77] :
    a. Developing Survivorship Clinics where oncologists could refer patients to receive comprehensive post-treatment services and support, including developing and discussing SCPs.
    b. Establishing Regional Cancer Education Centers focused on improving cancer literacy among patients, caregivers, and the community and empowering patients to understand better and manage their care.
    c. Advocating for Policy and Regulatory Changes that support the reimbursement of SCP-related services by insurance providers including the Vital Health program (Medicaid) and integrate these plans as a standard requirement to obtain the CoC cancer care certification.
    d. Involving other Non-Oncologist Healthcare Providers in the administration and discussion of the SCP and equipping them with the necessary training to manage the plan effectively, relieving the burden on oncologists and ensuring consistent delivery of survivorship care.
    e. Enhancing Patient Education by developing plain language materials in Spanish that cover key aspects of survivorship care (i.e., disease management, post-treatment monitoring, and strategies for improving quality of life) and providing training for oncologists and their staff on improving communication strategies to engage patients in discussions about their care.

Objective No. 3: By 2030, increase the use of survivorship services and resources among cancer survivors, families, and caregivers.		
Measure	**Baseline (year)**	**Target 2030**
Use of survivorship services and resources among cancer survivors, families, and caregivers.	TBD	TBD

TBD: To be determined.
Potential source: PRCCCP.

Strategic actions:

1. Partner with clinical facilities to gather data on the survivorship services and resources given to cancer patients.
2. Promote collaboration among cancer centers, healthcare professionals, community-based organizations, governmental and private agencies to increase the utilization of supportive services among cancer survivors and caregivers.
3. Diversify strategies to disseminate survivor resources and services (i.e., clinical facilities webpages, social media pages, mobile applications, send materials by mail, give them on hand during health fairs at communities).
4. Promote the implementation of EBIs or other educational initiatives on cancer survivorship and/or quality of life for cancer survivors, their caregivers, and families.
    a. Annual virtual and in-person follow-up talks or workshops for survivors, their families and caregivers about the latest trends and health resources and support groups.

b. Develop recorded educational capsules and educational material on resources for cancer patients and survivor care plans and partner with facilities to project/distribute them in the waiting rooms as well as in different mass media (e.g., social networks, radio, television).

Objective No. 4: By 2030, increase number of educational, wellness and alternative activities for cancer survivors and caregivers.		
Measure	**Baseline (year)**	**Target 2030**
Number of educational, wellness and alternative activities for cancer survivors and caregivers.	TBD	TBD

TBD: To be determined.
Potential source: PRCCCP.

Strategic actions:

1. Create permanent survivorship support groups that offer emotional and holistic support.
2. Promote continued education to physicians and other healthcare providers on cancer survivorship and the SCPs.
3. Develop fairs, workshops, and conventions to support the physical, mental, and emotional health of survivors and caregivers, as well as other recreational activities.
4. Educate survivors about hereditary cancers and the use of genetic testing, genetic counseling and educate about new current methodologies accessible to them.

Economic Impact

Objective No. 5: By 2030, reduce the economic impact of cancer care by decreasing the direct medical costs and indirect costs for all cancers and by cancer type.		
Measure	**Baseline (year)**	**Target 2030**
Direct medical costs for all cancers and by cancer type.	TBD	TBD
Indirect costs for all cancers and by cancer type.	TBD	TBD

TBD: To be determined.
Potential source: PRCCCP.

Strategic actions:

1. Partner with hospitals, clinical facilities, ASES, and private health insurances to gather data on medical costs related to cancer.
2. Partner with professors and/or students from academic institutions to consult on this objective.
3. Advocate for legislation and public policy that require monitoring of the excess costs imposed by providers or health insurances on cancer treatments and regulation of non-coverage costs.

Palliative Care and Pain Management

Objective No. 6: By 2030, increase number of facilities that provide services for palliative care and pain management.		
Measure	**Baseline (year)**	**Target 2030**
Number of facilities that provide services for palliative care and pain management.	TBD	TBD

TBD: To be determined.
Potential source: PR-BRFSS, PRCCCP.

Objective No. 7: By 2030, increase the percent of cancer survivors who had pain caused by disease or treatment under control.		
Measure	**Baseline (year)**	**Target 2030**
Percent of cancer survivors who had pain caused by disease or treatment under control.	66.8% (2022)	70.1%

Source: Serrano-Rodríguez RA, Rodríguez-Alamo N. Insights into Cancer Survivorship: 2022 Data Report. February 2024. Puerto Rico Behavioral Risk Factor Surveillance System, Puerto Rico Department of Health.
Note. The target is based on 5% of improvement.

Strategic actions:

1. Improve access to pain treatments throughout the survivor's treatment with integrated and timely services of pharmacology, alternative therapy, non-pharmacological therapy.
2. Integrate a short- and long-term patient contact and surveillance system into SCP, monitoring the response to pain, according to the needs presented by each patient.
3. Maintain a communication system (interoperability) with primary physicians for the sending and discussion of pain management plans established for patients, mitigating problematic opioid use.
4. Development of smoking cessation programs for the surveillance and continuity of care of surviving patients.
5. Establish palliative care programs where discussion of advanced medical care and pain management guidelines is encouraged under the primary physician.
6. Offer medical accessibility in palliative care by granting credentialing to doctors specialized in palliative medicine and pain management.
7. Educate physicians in palliative care and offer education to patients about pain management and alternatives and determine resources that patients have through existing programs.
8. Adopt the following recommendations from the American Cancer Society[78]:
    a. Use of state policies and regulations to define standards and services for palliative care.
    b. Expand or establish the number of providers within insurers to allow for the provision of palliative care in all areas.
    c. Allow Medicaid to pay for high-value services beneficial to those suffering from a serious illness using existing codes.
    d. Add palliative care coverage requirements in all settings to the contracts of Medicaid managed care organizations, including special considerations for pediatrics, adolescents, and young adults.
    e. Incorporate quality measurement reporting requirements for serious illnesses and/or incentive programs in contracts with providers and managed care organizations.
    f. Review state professional licensing requirements for health and continuing education to include a minimum number of instructional hours in both communication skills and basic knowledge of palliative medicine.
    g. Increase the role of state public health agencies in promoting palliative care by creating a public awareness campaign.

PART IV: Emerging Priorities

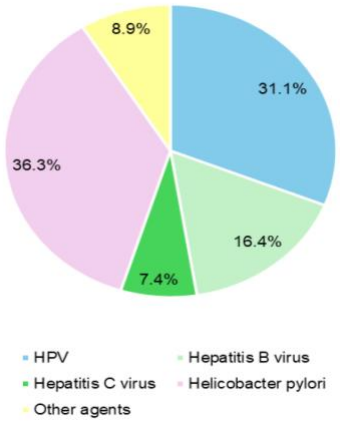
Infection-related Cancers

Infection-related cancers are those attributable to infections, and account for around 15% of all new cancer cases occurring annually worldwide.[79–81] Around 150,000 cancer cases in Latin American and the Caribbean are caused annually by infections agents,[81] that include certain viruses, bacteria, and parasites that can cause or increase the risk of developing cancer by disrupting the cell signaling pathways (growth, division, proliferation), weakening the immune system, and causing chronic inflammation.[82] According to the International Agency for Research on Cancer (IARC),[80] the following 10 infectious agents have been classified as well-established carcinogenic agents in humans according to the scientific evidence (group 1): hepatitis B virus (HBV), hepatitis C virus (HCV), human papillomavirus (HPV high-risk types), Epstein–Barr virus (EBV), human herpesvirus type 8 (HHV-8), human T-cell lymphotropic virus type 1 (HTLV-1), *Helicobacter pylori (H.pylori)*, *Opisthorchis viverrini*, *Clonorchis sinensis*, and *Schistosoma haematobium*. Nevertheless, there are other infection agents classified as probably carcinogenic to humans (group 2A), possibly carcinogenic to humans (group 2B) or not classifiable as carcinogenic to humans (group 3).[80,83]

SPOTLIGHT

- Infection-related cancers account for around 15% of all new cancer cases occurring annually worldwide.
- Most common infection agents worldwide are Helicobacter pylori, HBV, and HCV.
- Most common infection-related cancers worldwide are gastric, liver, and cervix.

Figure 1. Most common infectious agents, 2018 worldwide.



Source: International Agency for Research on Cancer. Cancers attributable to infections. 2024.

Most common infection-related cancers in PR

Cervix, liver, gastric.

The most common infection agents attributable to cancer development are *H. pylori*, HPV, HBV, and HCV, accounting for 8 of each 10 infection-related cancers worldwide.[79] Consequently, the most common infection-related cancers worldwide are gastric, cervix, and liver cancer.

SPOTLIGHT

- Infection-related cancers are preventable through early screening, vaccines and drug therapies.

Given the high burden of infection-related cancers in Latin America and the Caribbean, this section will align with the goals of the first edition of the Latin American and the Caribbean Code Against Cancer, developed as part of a collaboration between the IARC, the Pan-American Health Organization (PAHO) and the World Health Organization (WHO). As part of this Code, 17 evidence-based recommendations for cancer prevention were developed

to guide cancer control efforts in the region, including three or the prevention of infection-driven malignancies.[84] For infection-related cancers, recommendations include HBV and HPV vaccination, and HPV screening for cervical cancer, among others.

In Puerto Rico, infection driven malignancies are a public health concern, with research showing increased burden of infection driven malignancies in this population, similar to what is observed in US Hispanics as compared to Non-Hispanic Whites.[85–87] As an example, Puerto Rico has the highest incidence rates of cervical cancer in the US (12.0 vs 7.5 per 100,000 for the 2016-2020 period) , being the jurisdiction further away from achieving the goal of elimination (<4 cases per 100,000 women) established by WHO.[88–90] To achieve elimination, countries must strengthen vaccination, screening and timely treatment[88] to provide evidence-based information about the use of this test as a cervical cancer screening tool.[91]

HPV-related cancers

HPV is the most common sexually transmitted infection worldwide and it can cause several cancers, including cervical, anal, penile, oropharyngeal, vaginal, and vulvar cancer.[92] The most common HPV-related cancer in PR is cervical cancer with an incidence of 11.5 per 100,000 persons, being the territory of the US with the highest incidence. HPV-related cancers are preventable through vaccination[92], recommended for individuals aged 11-26 years, and approved for use for adults up to the age of 45. Since 2018, PR is one of five territories with a school entry policy for HPV vaccination in children aged 11 to 12 years and amended in 2020 to expand the age range for children aged 11 to 16 years old.[93,94] HPV-related cancers screening guidelines only exist for cervical and anal cancer.[95,96] Screening guidelines for these cancers may differ for high-risk populations such as people living with HIV (PLWH), women with a history of gynecological cancers, and organ transplants. It is important to highlight that screening has shown to result in increased survival in Puerto Rican women[97], and that disaster situations have resulted in disruptions in prevention services.[98,99]

Table 1. Proportion of cancers attributable to HPV.

HPV-related cancers	Proportion of cancer attributable to HPV.
Cervix	91%
Anus	91%
Oropharyngeal	70%
Penile	63%
Vaginal	75%
Vulva	69%

Source: National Program of Cancer Registries SEER*Stat Database: U.S. Cancer Statistics Incidence Analytic file 1998–2020. United States Department of Health and Human Services, Centers for Disease Control and Prevention. Released June 2023, based on the 2022 submission.

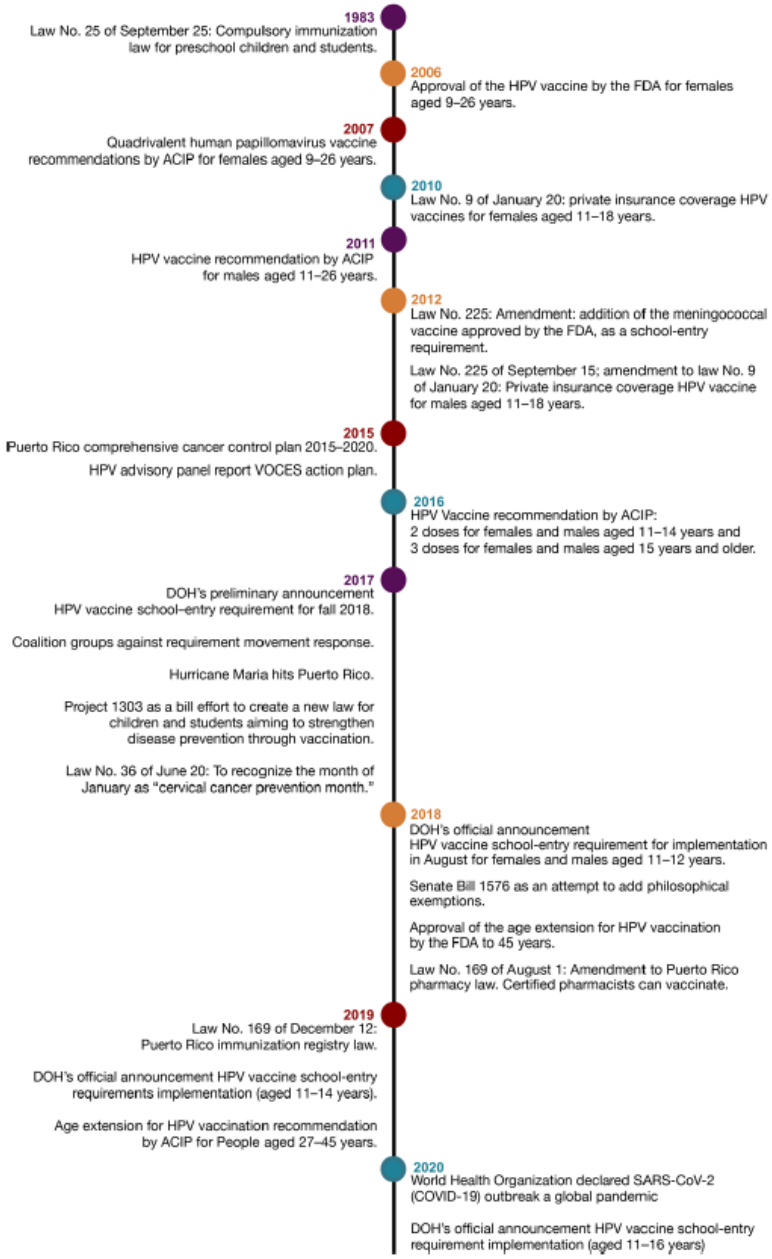
Table 2. Incidence and mortality rates for HPV-related cancers in Puerto Rico (2017-2021)

HPV-related cancers	Incidence (per 100,000 persons)	Mortality (per 100,000 persons)
Cervix	11.5	2.2
Anus	1.6	0.1
Oropharyngeal	8.6	2.4
Penile	2.3	0.4
Vaginal	1.1	0.2
Vulva	1.3	0.2

Source: Incidence and mortality file of the Puerto Rico Central Cancer Registry. March 2024

One significant achievement toward HPV prevention in Puerto Rico, was the new policy was established since 2018 requiring HPV vaccination for school entry in children aged 11 to 12 years and amended in 2020 to expand the age range for children aged 11 to 16 years.[98]

Timeline of efforts to reduce the HPV burden in Puerto Rico



Source: Colón-López V, Vázquez-Otero C, Rivera-Figueroa V, et al. HPV Vaccine school entry requirement in Puerto Rico: historical context, challenges, and opportunities. Prev Chronic Dis 2021; Aug 5;18:E77.

Liver cancer

Hepatitis B and C are liver infections caused by HBV and HCV agents. [100] HBV is spread through blood, semen, and other body fluids from an infected person, while HCV is spread through contact with blood of an infected person. Chronic HBV and HCV could cause serious health issues such as cirrhosis and liver cancer. Around 65% of liver cancers are due to HBV (15%) and HCV (50%).[101] HBV could be preventable through vaccination; administration of this vaccine is recommended within the first 12 hours of birth.[102] Although no vaccine is available for HCV, it could be prevented by avoiding risky behaviors such as sharing contaminated syringes.[100] Screening for HBV and HCV is recommended for all people aged 18 years or more at least one time in their lives and pregnant women; routine screening is recommended for high-risk populations such as PLWH and injectable drug users. Early detection of HCV is important to provide timely treatment (8-12 weeks after diagnosis). Hepatitis infections are considered a public health threat in the US and the Viral Hepatitis National Strategic Plan: 2021-2025 has the overarching goal of eliminating hepatitis in the US by 2030.[103]

Table 3. Incidence and mortality rates for liver cancer Puerto Rico (2017-2021)

Liver cancer	Incidence (per 100,000 persons)	Mortality (per 100,000 persons)
Overall	8.0	6.8
Men	13.0	4.0
Women	10.4	3.8

Source: Incidence and mortality file of the Puerto Rico Central Cancer Registry. March 2024.

Gastric cancer

H. Pylori affects approximately half of the population worldwide.[104] Infection with H. Pylori is usually acquired during childhood, especially in populations that live in poverty, crowded spaces, and poor sanitation.[105] The infection can be transmitted from person to person through oral contact with saliva, stool, and vomit. H. Pylori is associated with gastric cancer, the leading infection-related cancer.[104,106] Approximately 75% of gastric cancers are attributable to an infection with H. Pylori.[107] Although in the US the incidence of gastric cancer has been decreasing and is not among the most common causes of death from cancer[106,108], in Puerto Rico it is among the first 15 diagnoses of cancer and among the first 10 causes of death by cancer (7th in men and 9th in women).[86] Although there are no established guidelines for the prevention of gastric cancer, the National Cancer Institute makes recommendations for reducing gastric cancer risk, which include smoking cessation and the elimination of H. Pylori infection.[109] Although there is not much evidence in this regard, the National Cancer Institute highlights that excessive consumption of salt and not eating fresh fruits and vegetables increases the risk of gastric cancer.

Table 4. Incidence and mortality rates for gastric cancer in Puerto Rico (2017-2021)

Liver cancer	Incidence (per 100,000 persons)	Mortality (per 100,000 persons)
Overall	6.5	3.3
Men	7.9	4.4
Women	5.4	2.4

Source: Incidence and mortality file of the Puerto Rico Central Cancer Registry. March 2024.

Areas of opportunities

1. Support research efforts focused on cervical HPV self-sampling.[91]
2. Support research efforts for the development of information that will guide the creation and implementation of screening guidelines for oropharyngeal, vaginal, vulva, and penile cancers.
3. Train dentists to screen for oral cancers and establish standardized oropharyngeal cancer screening.
4. Collaborate with community organizations for the implementation of syringe sharing and use of syringe services programs among people who inject drugs.

GOAL	Prevent infection-related cancers in Puerto Rico.

Objective No. 1: By 2030, reduce the incidence and mortality of infectious-related cancers.

Measure	Baseline (year)	Target 2030
Incidence rate of cervical cancer per 100,000 persons.	12.0 (2016-2020)	TBD
Incidence rate of liver & bile duct cancer per 100,000 persons.	8.2 (2016-2020)	TBD
Incidence rate of stomach cancer per 100,000 persons.	6.5 (2016-2020)	TBD

TBD: To be determined.
Source: CDC Cancer Statistics: Data Visualizations (https://gis.cdc.gov/Cancer/USCS/#/StateCountyTerritory/).

Strategic actions:

1. Promote awareness and knowledge to the community regarding infectious-related cancers, including education activities during proclamation months (e.g., August – Human Papilloma Virus Awareness, July – Hepatitis Awareness).
2. Promote the implementation of patient navigator programs to increase timely treatment (e.g. identification of cervical pre-cancerous lesions).
3. Promote the importance of adherence to screening guidelines among the population.

Objective No. 2: By 2030, increase the percent of HPV-related cancers screening uptake.

Measure	Baseline (year)	Target 2030
Anal Cancer Screening: People living with HIV 35 years or older who had an anal Pap test every 12 months.	TBD	TBD

TBD: To be determined.
Potential source: UPRCCC.

Strategic actions:

1. Support the use of reminder phone calls from medical offices for anal and cervical screening follow ups.
2. Support physicians' training on High Resolution Anoscopy (HRA) test for anal cancer screening.
3. Collaborate with clinics that provide services to people living with HIV/AIDS (PLWH) to educate about the anal cancer screening guidelines.
4. Establish a collaboration agreement with the Puerto Rico Health Insurance Administration and the Puerto Rico HIV/AIDS Surveillance Program to have access to the anal screening utilization data.

NOTE: *Additional objectives and indicators on HPV vaccination and cervical screening can be found in Part III – Prevention section (pp. 22) and Screening & Early Detection section (pp. 31).*

Objective No. 3: By 2030, promote awareness and knowledge of Helicobacter Pylori and the risk factors for gastric cancers through collaborations with stakeholders.		
Measure	**Baseline (year)**	**Target 2030**
Number of collaborations with stakeholders related to awareness and knowledge of Helicobacter Pylori and the risk factors for gastric cancers.	TBD	40 collaborations (8 per year)

TBD: To be determined.
Source: Healthy People 2030.
Note. The target is based on the Healthy People 2030.

Strategic actions:

1. Develop educational materials (videos, flyers, manuals, curriculums) focused on H. Pylori risk factors, diagnosis, and treatment.
2. Establish collaborations agreements with:
    a. physicians to improve their knowledge about H. Pylori risks factors and its association with gastric cancer.
    b. hospitals to increase awareness and knowledge of H. Pylori among their staff and patients through seminars and educational campaigns.
    c. Office of Community Engagement of the UPRCCC to disseminate educational material about Helicobacter Pylori and its association with gastric cancer.
    d. academic institutions to promote research opportunities focus on assessing H. Pylori awareness and knowledge.

Objective No. 4: By 2030, reduce the transmission of hepatitis B and C infection.		
Measure	**Baseline (year)**	**Target 2030**
Incidence rate of HBV cases per 100,000 persons	1.8 (2022)	0.1
Percent of people with HCV (confirmed)	29.9% (2022)	20.0

Source: Departamento de Salud de Puerto Rico. Plan para la eliminación de las hepatitis virales en Puerto Rico: 2023-2027 (borrador). Sin fecha; Healthy People 2030.
Note. Target is based on the Healthy People 2030.

Strategic actions:

1. Promote the importance of being up to date with the HBV vaccine among children aged 24-months.
2. Collaborate with the PRDOH for the elimination of viral hepatitis in Puerto Rico (e.g., screening high-risk populations such as healthcare workers, PLWH, and individuals with a history of injection drug use).
3. Collaborate with community organizations for the implementation of safe syringe practices.
4. Create awareness about the importance of early detection, care, and timely treatment of HBV and HCV.
5. Support study interventions focus on reducing the exposure and infection of HBV and HCV such as condom use and safe syringe practices.

Social Determinants of Health in Cancer Care

Social determinants of health (SDOH) are the nonmedical factors in which people are born, grow, work, live, and age, that may have an influence on their health outcomes, including their chances of developing and dying from cancer.[110,111] SDOH are estimated to contribute to around 70% of cancer cases, raising the risk of death.[112–114] These factors have a greater impact on people's well-being and quality of life than genetic factors and access to healthcare alone, and they drive disparities and inequities across the cancer care continuum.[115] As a result, SDOH have become central to identifying best practices and tools to serve diverse populations, recognizing that people grow and develop under varied circumstances leading to different health outcomes. Addressing SDOH is now one of the eight goals established in the 2023 National Cancer Plan.[12]

SPOTLIGHT

- SDOH account for up to 70% of all cancer cases.

To systematically address these factors, Healthy People 2030 groups SDOH into five key areas: ***health care access and quality, education access and quality, social and community context, economic stability, and neighborhood and built environment***.[115] Meanwhile, the CDC has developed a six-pillar framework for addressing SDOH through **data and surveillance, evaluation and evidence-building, partnerships and collaboration, community engagement, infrastructure and capacity, and policy and law**.[110]

Social determinants of health (SDOH): Key areas

Adapted from: Healthy People 2030. Social determinants of health. 2023. U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion.

CDC's framework for addressing SDOH

Source: Centers for Disease Control and Prevention. Social Determinants of Health at CDC. Atlanta, GA; 2022.

In Puerto Rico, there is a pressing need to address SDOH. The archipelago of 78 municipalities and 3.2 million people experiences unique geographic diversity, leading to notable differences among its residents. Though it is a small territory, its combination of urban areas, mountains, rivers, and location in the Caribbean contributes to the distinctive health challenges that vary by location.

SDOHs in PR

- 4 in 10 persons live below the poverty level.
- Physician migration and distribution (access to care).

Currently, 41.7% of the population lives below the poverty line, relying on Medicaid or Medicare for health insurance coverage.[13] Additionally, 6.4% of individuals under 65 lack health insurance, further intensifying cancer disparities.[55] .). The most recent cancer incidence and mortality report highlights disparities by municipality, particularly affecting rural communities.[16]

Concerning healthcare access and quality, Puerto Rico faces issues like physician migration and an aging healthcare workforce. From 2016 to 2018, the median age of active physicians was 55.2 years (52.8 for generalists and 56.3 for specialists).[116] Physician availability also varies widely; for example, San Juan has 87.67 licensed physicians per 10,000 residents, while Toa Alta has only 5.34 per 10,000.[116,117] Recent reports indicate that 114 oncologists are available to manage approximately 16,000 new cancer cases per year, alongside 65,000 cancer survivors.[118,119] Challenges remain in accessing and monitoring the quality and availability of approved treatments covered by health insurance, further compounding disparities.

Alongside these healthcare challenges, Puerto Rico's population is aging rapidly, with a general drain of young talent accentuating the already high median age, which rose from 36.9 years in 2010 to 45.2 years in 2020.[120] As demand increases for healthcare services to treat chronic conditions like cardiovascular disease, cancer, and diabetes, the role of SDOH becomes even

more pronounced.[14] Although cancer mortality has decreased, incidence rates continue to rise, further highlighting the importance of addressing SDOH.

IMPROVEMENT

- Healthy literacy (on COVID-19) among cancer patients in PR seems to reduce the cancer burden.

WORSENING

- Having a public health plan and untimely access to care in PR among colocteral cancer patients seems to increase the cancer burden.

In Puerto Rico, economic stability is a critical SDOH, as many individuals cannot afford essentials like healthy foods, healthcare, and housing. Even those with steady employment often struggle to meet these needs due to low wages, underscoring the importance of policies supporting access to food, housing, healthcare, and education to reduce poverty and improve overall health. Education access and quality also profoundly impact health; individuals with higher education levels tend to live longer, healthier lives. Limited access to quality education reduces opportunities for stable, well-paying jobs, perpetuating economic instability and health disparities. Additionally, neighborhood and built environment conditions shape cancer risks. Improving neighborhood safety and accessibility—by adding sidewalks and bike lanes, for example—can promote health, safety, and quality of life, ultimately reducing cancer risks across communities. Research[121–123] about certain SDOH and its relationship with cancer care in Puerto Rico has found that SDOHs such as type of health insurance coverage, access to cancer care services and health literacy may be contributing to the cancer burden.

Type of health insurance coverage

- A study from Ortiz-Ortiz et al. published in 2014 using 5-year survival estimates for colorectal cancer found that was more common to observe this type of cancer at advance stages in patients with public health plan (Government Health Plan) when compared with those that had non-public plan (44.3% vs. 40.2% regional stage and 13.6% vs. 10.4% distant stage, respectively) even when the public health plan contains a provision for cancer coverage that begins upon the confirmation of a cancer diagnosis. Additionally, patients in the age groups 50–64 years (RR = 6.59; CI: 2.85–15.24) and ≥65 years (RR = 2.4; CI: 1.72–4.04) with public health plan showed a greater excess risk of death when compared with those in the same age groups but with non-public plan.

Access to cancer care services

- Another study from the Ortiz-Ortiz and colleges published in 2016, evaluated factors associated with a late stage at diagnosis among colorectal cancer patients with public health plan during 2012. Authors found that 6 out of each 10 colorectal cancer patients diagnosed at late stage. Having a diagnostic delay of more than 59 days (AOR: 2.94, 95%CI: 1.32 to 6.52) and having the first visit through the emergency room (AOR: 3.48, 95%CI: 1.60 to 7.60) were factors significantly associated with being diagnosed with colorectal cancer at a late stage, after adjusting for other factors.

Health literacy

- A study on COVID-19 vaccination from Rodriguez and collaborators (2021) found that patients with a self-reported cancer diagnosis were two times more likely to get COVID-19 vaccine than healthy participants (95% CI: 1.00–4.30). In addition, those with self-reported cancer diagnosis and other chronic conditions showed significantly higher perceived COVID-19 susceptibility and severity.

GOAL	Mitigate the impact of SDOHs across the cancer care continuum. *(Aspirational: Leverage health equity through cancer structural changes that increase the general health of the population)*

Objective No. 1: Education Access and Quality: By 2030, reduce self-reported prevalence of cancer by education status.		
Measure	**Baseline (year)**	**Target 2030**
Self-reported prevalence of cancer by education status among those with an education status ≤ high school.	(2022) 57.1%	54.2%

Source: PPR-BRFSS COVID-19 Data Report 2022.
Note. Target is based on 5% of improvement.

Objective No. 2: Economic Stability: By 2030, reduce self-reported prevalence of cancer by income.		
Measure	**Baseline (year)**	**Target 2030**
Self-reported prevalence of cancer by income among those with an annual income: *< $15,000* *$15,000 - < $25,0000*	(2022) 40.6% 28.6%	 38.6% 27.2%

Source: PPR-BRFSS Health Disparities Report 2022.
Note. Target is based on 5% of improvement.

Strategic actions:

1. Increase health care access by partnering with government agencies, clinical facilities and community organizations (e.g., PRDOH, Centers 330) to:
    a. deliver health fairs and mobile clinics close to where underserved groups live and provide cancer education and free screening services.
    b. provide incentives (e.g., transportation, childcare services).
    c. promote the integration of patient's navigation programs.
    d. perform community health needs assessments.

NOTE: *Additional objectives and indicators related to health insurance among breast and cervical cancer patients can be found in Part III – Screening & Early Detection section (pp. 30 and 31). Another potential source of SDOH data is the All of Us initiative.*

Cancer Related to Environmental and Occupational Exposures

Occupational Exposures and Cancer

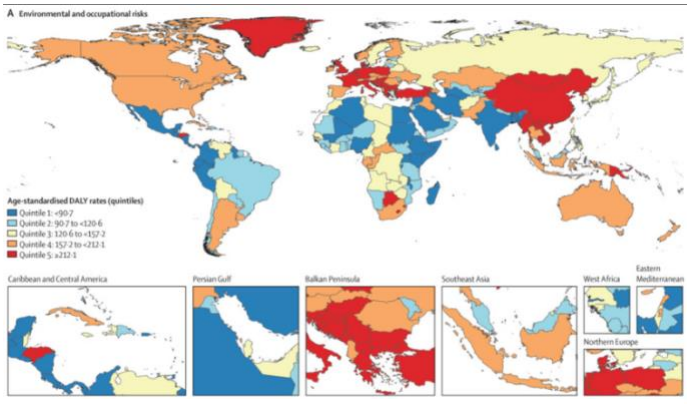
The link between cancer and environmental and occupational factors is intricate; while some factors are well-established cancer causes, others remain more uncertain. Environmental and lifestyle factors have already been established and identified as contributors to about 50% of the global cancer burden.[124] Cancer-causing agents can affect the body through various routes, each with distinct impacts. These agents can enter our body through inhalation, skin contact, or ingestion. Furthermore, our grasp of cancer development is typically limited to studying one chemical or physical hazard at a time, leaving us with a limited understanding of the complex interactions and risks associated with exposure to multiple hazards over an individual's lifetime. The National Toxicology Program (NTP)'s Report on Carcinogens has identified the chemical substances listed below as known human carcinogens[125]:

Substance	Listing Status	Description
Chronic infection with *H. pylori*	Known to be a human carcinogen	Bacterium
Antimony trioxide	Reasonably anticipated to be a human carcinogen	Chemical compound
Bromochloroacetic acid (BCA)	Reasonably anticipated to be a human carcinogen	Water disinfection byproduct
Bromodichloroacetic acid (BDCA)	Reasonably anticipated to be a human carcinogen	Water disinfection byproduct
Chlorodibromoacetic acid (CDBA)	Reasonably anticipated to be a human carcinogen	Water disinfection byproduct
Dibromoacetic acid (DBA)	Reasonably anticipated to be a human carcinogen	Water disinfection byproduct
Dichloroacetic acid (DCA)	Reasonably anticipated to be a human carcinogen	Water disinfection byproduct
Tribromoacetic acid (TBA)	Reasonably anticipated to be a human carcinogen	Water disinfection byproduct

Source: NTP (National Toxicology Program). Report on Carcinogens, Fifteenth Edition.; 2021.

Two key principles are central to the current discussions on occupational and environmental cancer. First, the public health prevention principle advocates for reducing exposures by taking preventive measures when there is a reasonable suspicion of a potential threat, even if the exact risk level or nature is not fully understood. Second, the concept of **environmental justice (EJ)** emphasizes equitable treatment and active involvement of all individuals, regardless of race, color, national origin, or income, in the creation, enforcement, and execution of environmental laws and policies. The EJ principle aims to ensure that everyone has the same level of protection from environmental hazards and equal opportunities to participate in decision-making processes, thereby promoting a healthy environment for living, learning, and working.

This section outlines the links known between environmental and occupational exposures and cancer. Global map of age-standardized DALY rate quintiles for risk-attributable cancer burden, both sexes combined, 2019 for



Source: Tran KB, Lang JJ, Compton K, et al. The global burden of cancer attributable to risk factors, 2010–19: a systematic analysis for the Global Burden of Disease Study 2019. The Lancet. 2022:400(10352):563-591.

Environmental and Occupational Risks. This map represents estimates at the national level. Quintiles are based on age-standardized DALY rates per 100 000 person-years. DALYs=disability-adjusted life-years.[126]

Occupational Hazards

Occupational exposures, for this cancer plan's purpose, refers to the contact or interaction workers have with potentially harmful agents or conditions in their workplace that could increase their risk of developing cancer. These exposures can include chemicals, physical agents, biological agents, and other hazardous conditions encountered during the performance of job duties. Occupational exposures are critical factors in cancer prevention and control strategies, as they directly impact workers' health and safety. Examples of occupational exposures include:

- **Asbestos:** Strongly associated with lung cancer, mesothelioma (a rare cancer of the lining of the lungs or abdomen), and other respiratory cancers. Workers in construction, shipbuilding, and manufacturing industries are particularly at risk.
- **Benzene:** a well-known carcinogen linked to leukemia and other blood cancers. It is commonly found in industries such as petrochemical manufacturing, oil refineries, and printing.

While there have been significant advancements in managing many workplace hazards, exposure to cancer-causing agents, or carcinogens, remains a concern in various industries. The CDC reports that less than 2% of chemicals produced or processed in the U.S. have undergone carcinogenicity testing. It is estimated that occupational exposures contribute to 3% to 6% of global cancers, which translates to 45,000 to 91,000 new cancer cases annually in the U.S., including Puerto Rico. Additionally, some research indicates notable racial disparities, with Black, Indigenous and People of Color (BIPOC) experiencing higher cancer rates compared to Whites.[127] Although the exact reasons for these disparities are not fully understood, variations in exposure levels are believed to explain at least part of the difference. The International Labor Organization estimates 666,000 deaths that are caused by occupational cancer globally every year, with lung cancer accounting for 54–75% of occupational cancers.[128]

Employment trends have evolved, but ongoing surveillance for occupational cancer remains essential, along with the collection and analysis of data on both current and past jobs as potential risk factors.[129] Additional details about occupational cancers can be found on the CDC's website: https://www.cdc.gov/niosh/cancer/about/index.html

Outdoor Air Pollution

Air pollution consists of a complex blend of chemicals, many of which are known or suspected carcinogens from various sources. While the cancer risk from airborne chemicals is relatively low compared to other exposures, public health professionals remain concerned about air quality due to the widespread exposure to pollutants and the potential for individuals to encounter poor air quality throughout their lives.[130] Most hazardous air pollutants (HAPs) come from mobile sources, like vehicles, and stationary sources, such as industries[131,132]. Substantial evidence supports a causal link between outdoor (ambient) air pollution, with lung cancer incidence and mortality,[133] while epidemiological evidence on outdoor air pollution and risk of other types of cancer, such as bladder cancer or breast cancer, is more limited.

Calculating the risks of individual chemical hazards in the air is challenging, so estimates are made using models like the EPA National-Scale Air Toxics Assessment. However, these are

approximations, and more precise monitoring is needed in Puerto Rico. The United States Environmental Protection Agency (EPA) provides publicly available data on air quality for all states and territories, including Puerto Rico, through their website: https://www.epa.gov/outdoor-air-quality-data. This website allows individuals to download daily air quality data, visualize through air quality trackers and explore summary reports. Data for Puerto Rico provided through the EPA website was collected in partnership with the Puerto Rico Department of Environmental and Natural Resources. In addition, the EPA released the Air Data Air Quality Monitors app, a mapping application available on the web and on mobile devices that displays monitor locations and monitor-specific information. It also allows the querying and downloading of data daily and annual summary data. More information about Air Data Air Quality Monitors app is available through their website: https://www.epa.gov/outdoor-air-quality-data/interactive-map-air-quality-monitors.

Additionally, the American Lung Association grades United States counties on air quality, including disparities in air quality across counties in Puerto Rico: https://www.lung.org/research/sota/city-rankings/states/puerto-rico

Waterborne Exposures

Water sources can be contaminated by naturally occurring substances, human activities, or by-products formed during water disinfection for drinking purposes. To safeguard Puerto Rico's surface waters, such as lakes and streams, water quality standards are enforced. Public drinking water systems are regulated by the Safe Drinking Water Act. The Puerto Rico Department of Health monitors all public and private water systems for approximately 90 contaminants and determines compliance with the National Primary Drinking Water Regulation.

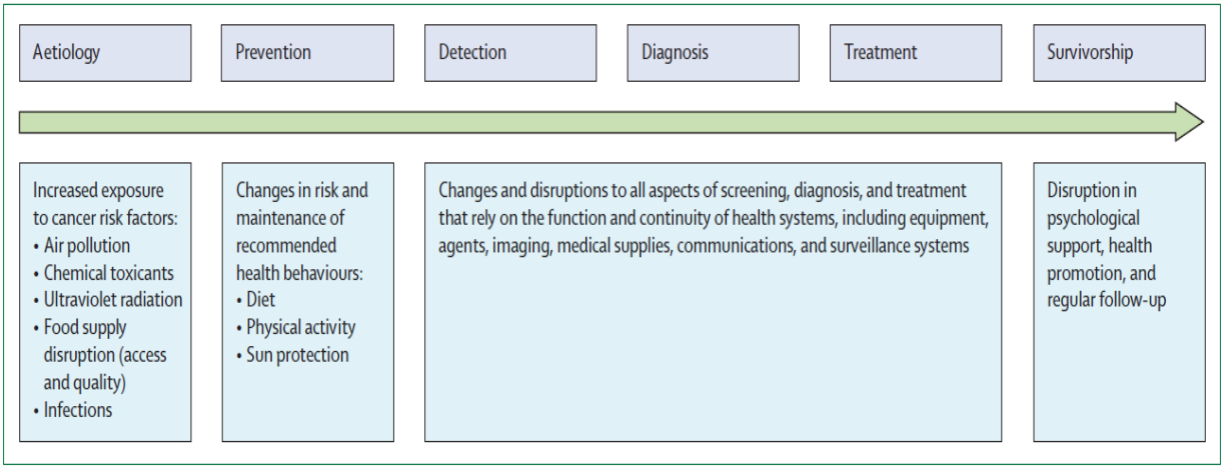
The Drinking Water Program maintains in its inventory and under its supervision, 463 public water systems.[134] f these, 160 are operated by the Puerto Rico Water and Sewerage Authority (PRASA) and 303 non-Authority systems, known as Non PRASA. Of the Non PRASA systems, 241 are communal systems (operated by communities) and 62 systems are private (industries, pharmaceuticals, etc.). PRASA operates Puerto Rico's public water supply and wastewater systems. Such systems provide water and wastewater services to approximately 97% and 59% of Puerto Rico's population, respectively (1.264,321 active clients).[135] Households connected to PRASA can verify their water quality reports at by water systems in their website: https://www.acueductos.pr.gov/cumplimiento/informe-sobre-la-calidad-del-agua. However, private well owners are responsible for ensuring the safety of their well water once it has been approved. For information on how to maintain safe private well water, visit the CDC's page at: https://www.cdc.gov/healthywater/drinking/private/wells/maintenance.html

Climate Change and Cancer

Climate extreme events are of interest worldwide given their potential for substantial impacts on social, ecological, and technological systems. Human induced climate change is already having immediate human costs. Consequently, extreme weather and disasters have worsened through the years (i.e., droughts, heat waves, wildfires, flooding, tropical storms and hurricanes, extreme weather) with direct or indirect impacts on the healthcare system, healthcare providers, the health of cancer patients, their families, caregivers, and communities, in addition to environmental effects.[136,137] The health and economy of island states and territories are particularly vulnerable to extreme events associated with climate change, atmospheric conditions, and marine hazards.[138] Communities in the US Caribbean are systematically excluded from welfare, education, and other societal services and benefits that help sustain good health conditions.

These climate related disasters to long-term shifts in weather patterns may have adverse effects on the cancer control continuum by increasing cancer incidence and mortality, delaying cancer prevention efforts, and reducing cancer survival.[136,137,139] That is due to patients with cancer are a vulnerable population at higher risk of medical complications and death due to the collapse of or disruptions of the healthcare services as well as the community infrastructure, and the complexity of the cancer care.[140]

Effects of climate change-related disasters across the cancer control continuum



Source Hiatt RA, Beyeler N. Cancer and climate change. Lancet Oncol. 2020 Nov;21(11): e519-e527. Figure 1 pp.e520.

Ecological disasters recently experienced in PR

Hurricanes, earthquake/ aftermaths, COVID-19.

According to Méndez-Lázaro et al.[138] in the 5th National Climate Assessment for the US Caribbean, Puerto Rico is "particularly vulnerable to extreme weather events that are being exacerbated by human-driven climate change". This report also identifies five vulnerabilities affecting the archipelago: culture, access to resources, access to information, governance, fiscal and economic situation. On September of 2017 the US Caribbean Territories (Puerto Rico and USVI) suffered one of the most catastrophic hurricane seasons in recent history. Many of these affected territories (especially Puerto Rico) experienced major disruptions in essential services (e.g. potable water and electric power, telecommunications) and environmental health issues (e.g. water sanitation, contaminant exposure, vector borne diseases, food hygiene, and exposure to mold). Recent studies showed that heat and uncomfortable temperatures, air pollution (air quality), noise pollution and mosquitoes were the top ranked environmental concerns reported in the aftermath of the hurricanes Irma and Maria, followed by floods, rats and winds. Hurricane Maria also created disruptions in the Oncology Care System.[141] A case-control study from Rodriguez-Rabassa et al.,[63] delivered 4-months after the landfall of hurricane Maria, showed that cancer survivors had increased levels inflammatory of cytokines but did not show significant differences in terms of anxiety, stress, and post-traumatic symptoms when compared to the non-cancer participants. Whereas other study conducted through focus groups and key-informant interviews documented the experiences of patients with gynecologic cancer while receiving oncology care in Puerto Rico also by the time of the hurricanes Irma and Maria.[141] Results grouped in the four themes exposed the following areas of opportunity for cancer care:

Disruptions to continue oncology care – lack of basic services (i.e., electricity, potable water), severe infrastructure and roads damage caused by winds and flooding made that some clinical facilities were closed and others operating with limited services using power generators whereas the diesel supply lasted, problems with some medical equipments (i.e., radiotherapy) that required specific room temperature to function properly causing delays in treatments.

Challenges in communication between oncology providers and patients – prior the hurricanes, no plan was given communicate with them to ensure continuity of care neither a copy of their records, telecommunication systems were down for a long period and restoring it was slow provoking additional difficulties to get an appointment, and news about open clinics and services were accessed mainly through radio or by word of mouth.

Patient resilience to resume care – several patients decided to go to clinics with the expectation of finding them open, driving rute to clinical facilites took more time than usual due to affected roads and traffic lights not working.

Social support and resources received – from neighbors, community leaders, clinical facilities, inlcuding hot meals, fuel for generators, and transportation.

Regarding the COVID-19 pandemic, in Puerto Rico the first cases were documented since March 2020. Research on the impact of COVID-19 on colorectal screening using data claims from the Public Health System of Puerto Rico from 2016 to 2020 found a significant decrease of 34% in the numbers of colorectal cancer screening claims (PR_{adj}: 0.66, 95%CI: 0.64, 0.67) even after adjusting for several variables such as sex and health region.[142] Similarly, a study on cervical cancer screening among Medicaid patients during the hurricanes and the COVID-19 pandemic during the same period also found a significant decrease in screening utilization (2016: 2.81 per 100 person-months vs. 2020: 0.72 per 100 person-months).[99] In addition, the screening rates were even lower right after the hurricanes (September 2017: 1.02 per 100 person-months) and after the COVID-19 lockdown (April 2020: 0.37 per 100 person-months).

Even when there is a debate if earthquakes are related to climate change or not.[143] it is important to mention the effects that this type of disaster can have on cancer care in the light of the Puerto Rico's experience with the 6.4 magnitude earthquake of January 7, 2020, in the Southern region and the aftermaths. A study from Peña-Vargas and collaborators[144] found a significant relationship between exposure to seismic activity, the barriers to health care ($p < 0.001$) and the five subscales assessed using the Barrier to Care Questionnaire ($p < 0.01$) in patients with different cancer types (i.e., breast, uterus, colon, prostate, thyroid, skin) that attended community clinics and were recruited for a longitudinal case-control cohort study.

The subscales were:

Pragmatics	Accessibility, quality, and cost issues, which might prevent or delay services.
Skills	Strategies to navigate and function within the health care system.
Expectations	Quality of care received from providers and facilities.
Marginalization	Negative experience within the health care system - e.g., visits.
Knowledge and belief	Patient and physician's ideas and beliefs about the nature and treatment of illness.

Under these new challenging climate scenarios, the 2022-2031 plan for Global Change Research Needs and opportunities of the National Academies of Sciences, Engineering, and Medicine calls for federal agencies to broaden participation in the sciences, to enhance participatory approaches especially with underserved and disadvantaged communities, and to integrate equity and justice into all research programs.[145]

These disruptions in the cancer control continuum due to climate change-related disasters highlight the need of having updated preparedness and response plans that take in count cancer care[140,141] (Please refer to Annex IV: Resources). The report of the 5th National Climate Assessment for the US Caribbean[138] recommends the use of cancer control plans as this one to mitigate the impact of extreme weather and maintain adequate cancer control during and after.

Objective No. 1: By 2030, establish a literacy baseline about climate stressors through educational initiatives.

Measure	Baseline (year)	Target 2030
Participant literacy among climate stressors.	TBD	10.0%

TBD: To be determined.
Potential source: UPRCCC initiatives (e.g. CARIB-CARES, All of US).

Strategic actions:

1. Promote workshops and educational activities for health professionals to promote awareness about climate stressors.
2. Encourage the development of public campaigns that address the following issues:
    a. Heatwaves health effects among cancer patients
    b. Hurricanes and cancer survivorship
3. Collaborate with public and private sectors to co-products the following educational activities:
    a. Educational capsules
    b. Interviews with Specialists
    c. Information sheet (printed, social media)
4. Promote cancer timeliness screening among Puerto Rican's.

Objective No. 2: By 2030, strengthen emergency preparedness plans across cancer survivors, caregivers, and health professionals.

Measure	Baseline (year)	Target 2030
Establish preparedness plans or sections of the plan for:		
1) cancer patients and survivors	TBD	1
2) cancer caregivers	TBD	1
3) oncology professionals	TBD	1
4) oncology care services	TBD	1

TBD: To be determined.
Potential source: UPRCCC initiatives (e.g. CARIB-CARES, All of US).

Strategic actions:

1. Uphold the implementation of legislation, requiring emergency preparedness plans to hospitals and care services centers.
2. Promote and disseminate existing emergency preparedness education and resources among cancer survivors, caregivers, oncology professionals and care services.

NOTE: *An additional objective and indicator on ultraviolet exposure can be found in Part IV – Prevention section (pp. 27).*

Objective No. 3: By 2030, increase knowledge about environmental pollution as risk factor for selected cancers.		
Measure	**Baseline (year)**	**Target 2030**
Participant literacy about cancer causing substances in the environment.	TBD	10.0%

TBD: To be determined.
Potential source: UPRCCC initiatives (e.g. CARIB-CARES, All of US).

Strategic actions:

1. Identify at risk-communities living nearby established carcinogen contaminated sites to establish a registry of the most vulnerable communities to develop educational interventions.
2. Include up to five questions regarding environmental awareness about air and water pollutants in the BRFSS.
3. Promote policies that increase the periodicity of safety information about drinking water to trimestral reports including chemicals of concern for cancer.
4. Conduct educational activities for caregivers and healthcare professionals regarding the harmful effects of environmental pollution.

ANNEXES

ANNEX I: Acronym list

AAPC	Average annual percent changes
CDC	Centers for Disease Control and Prevention
EBI	Evidence-based intervention
EBV	Epstein–Barr virus
HER	Electronic health records
EJ	Environmental justice
HBV	Hepatitis B virus
HCV	Hepatitis C virus (HCV)human
HHV-8	human herpesvirus type 8
HPV	Human Papillomavirus, high-risk types
HTLV-1	human T-cell lymphotropic virus type 1
ICD-10	International Classification of Diseases, tenth edition
NCI	National Cancer Institute
NCCCP	National Comprehensive Cancer Control Program
NIH	National Institutes of Health
NOS	Not otherwise specified (cancer)
PLWH	People living with HIV
PR-BRFSS	Puerto Rico Behavioral Risk Factor Surveillance System
PRCCC	Puerto Rico Comprehensive Cancer Control
PRCCR	Puerto Rico Central Cancer Registry
PRCCCP	Puerto Rico Comprehensive Cancer Control Program
PRDOE	Puerto Rico Department of Education
PRDOH	Puerto Rico Department of Health
PSA	Prostate-Specific Antigen
PSE	Policy, Systems, and Environment
SDOH	Social determinants of health
SCP	Survivorship care plan
SOC	Standard of care
UPRCCC	University of Puerto Rico Comprehensive Cancer Center

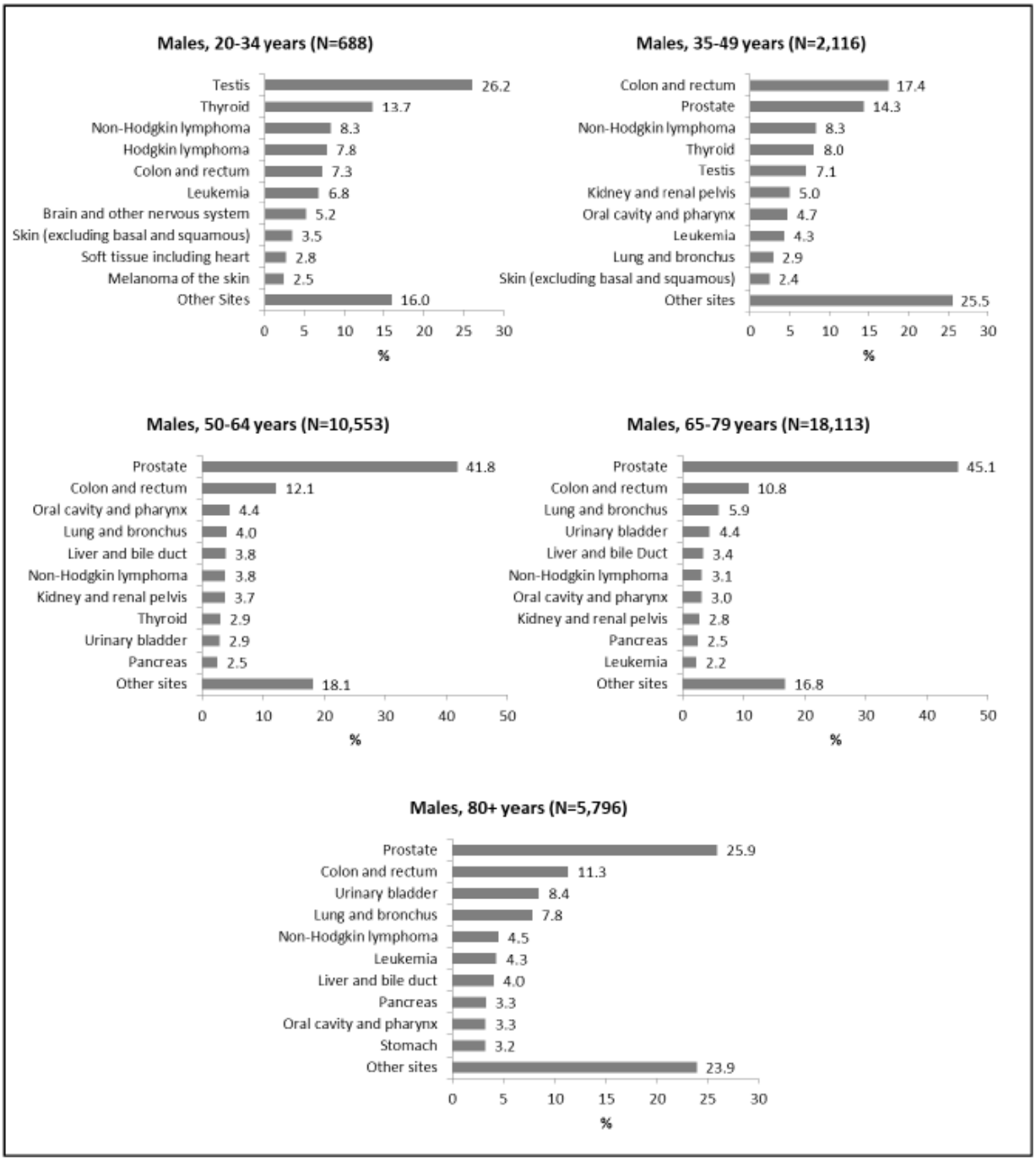
ANNEX II: Glossary of terms

Age-adjusted rates: An incidence or mortality rate statistically modified to eliminate the effect of different age distributions in the different populations; usually expressed as the number of new cases or deaths per 100,000 persons in a population.
Age-specific rates: An incidence or mortality rate limited to a particular age group. The numerator is the number of new cases or deaths within a specific age group whereas the denominator is the number of persons in that age group in the population; calculated per 100,000 people.
Behavioral Risk Factor Surveillance System (BRFSS): Is the nation's premier system of health-related telephone surveys that collect state data about U.S. residents regarding their health-related risk behaviors, chronic health conditions, and use of preventive services. BRFSS collects data in all 50 states as well as the District of Columbia and three U.S. territories.
Body mass index (BMI): A measure that relates body weight to height. BMI is sometimes used to measure total body fat and whether a person is a healthy weight. Excess body fat is linked to an increased risk of some diseases including heart disease and some cancers. Also called body mass index.
Bona Fide Agent: Also known as Administrative Partner (AP) is an organization that supports a governmental entity, such as a health department, with processing federal grants and assuring compliance with grant requirements. The goals of an administrative partnership are to increase the competitiveness of the health department in applying for and accepting federal funding and to expedite implementation of grant activities. Ultimately, the AP and the health department aim to improve the public's health and safety in the most efficient and effective manner.
Cancer prevention: Action taken by individuals or communities to reduce the chance of getting cancer.
Cancer survivorship: An individual is considered a cancer survivor from the time of diagnosis, through the balance of his or her life. Family members, friends, and caregivers are also impacted by the survivorship experience and are therefore included in this definition.
Climate change: A process of long-term shifts in weather patterns, largely from anthropogenic processes.
Clinical trials: Medical research studies in which cancer patients may volunteer to take part.
Continuum of care: In medicine, describes the delivery of health care over a period of time. In patients with a disease, this covers all phases of illness from diagnosis to the end of life.
Early detection: Identification of cancer or precancerous changes as early as possible, before they have had a chance to grow and spread, to increase the chances of successful treatment and survival.
Early diagnosis: Detection (of cancer) on symptomatic patients as early as possible.
Evaluation: The systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments about them, improve their effectiveness, and/or inform decisions about future development.
Evidence-based intervention (EBI): An approach to prevention or treatment that is validated by some form of documented scientific evidence.
Five-year survival rate: The percent of patients who are alive 5 years after their (cancer) diagnosis or treatment initiation.
Incidence: The number of new cases (of cancer) diagnosed during a specific time period.

Incidence rate: A measure of the frequency of occurrence of new (cancer) cases in a defined population during a specified interval of time.
Infection-related cancers: Cancers for which there is well-established evidence of a causal link with certain infectious agents, including viruses, bacteria, and parasites.
Invasive Cancer: Cancer that has spread beyond the layer of tissue in which it developed and is growing into surrounding, healthy tissues. Also called infiltrating cancer.
Mortality: The number of deaths from cancer diagnosed during a specific period. The cause of death was coded using the International Classification of Diseases, 10th edition (ICD-10).
Mortality rate: A measure of the frequency of occurrence of (cancer) deaths in a defined population during a specified interval of time.
Palliative care: Relief of symptoms and suffering caused by cancer and other life-threatening diseases. Palliation helps a patient feel more comfortable and improves the quality of life but does not cure the disease or alter the course of the disease.
Patient navigation program: An innovative approach that provides whole-patient care through intensive case management.
Prevention: Action taken to decrease the chance of getting a disease or condition. For example, cancer prevention includes avoiding risk factors (such as smoking, obesity, lack of exercise, and radiation exposure) and increasing protective factors (such as getting regular physical activity, staying at a healthy weight, and having a healthy diet).
Prevalence: The number or proportion of cases or events or conditions in a given population.
Quality of life: Is a broad multidimensional concept that usually includes subjective evaluations of both positive and negative aspects of life.
Recurrence (of cancer): Cancer comes back after treatment; can be classified as local, regional, or distant recurrence depending on the proximity regarding to the original cancer.
Rehabilitation: A process to restore mental and/or physical abilities lost to injury or disease, to function in a normal or near-normal way.
Relative risk: The relationship between the observed survival from all causes in a group of people with cancer and the expected survival from all causes in a similar group of people who do not have cancer.
Screening (of cancer): Checking for disease when there are no symptoms. Since screening may find diseases at an early stage, there may be a better chance of curing the disease. Examples of cancer screening tests are the mammogram (breast), colonoscopy (colon), and the Pap test and HPV test (cervix). Screening can also include checking for a person's risk of developing an inherited disease by doing a genetic test.
Social determinants of health (SDOH): Nonmedical factors that influence health outcomes.
Stage (at cancer diagnosis): The measure of the cancer spread from its origin. Most common classifications used are from CDC (SEER Summary Stage) and American Joint Committee on Cancer (TNM stage).
Standard of care (SOC): Treatment medically recommended and used as the most proper for a certain type of disease (e.g., cancer); also, unknown as standard therapy or best practice.
Surveillance: The continuous, systematic collection, analysis, and interpretation of health-related data needed for the planning, implementation, and evaluation.
Survivorship care plan: Record of a patient's cancer history and recommendations for follow-up care. The plan should define responsibilities of cancer-related, non-cancer-related, and psychosocial providers.
Treatment: Management and care of a patient or the combating of disease or disorder.

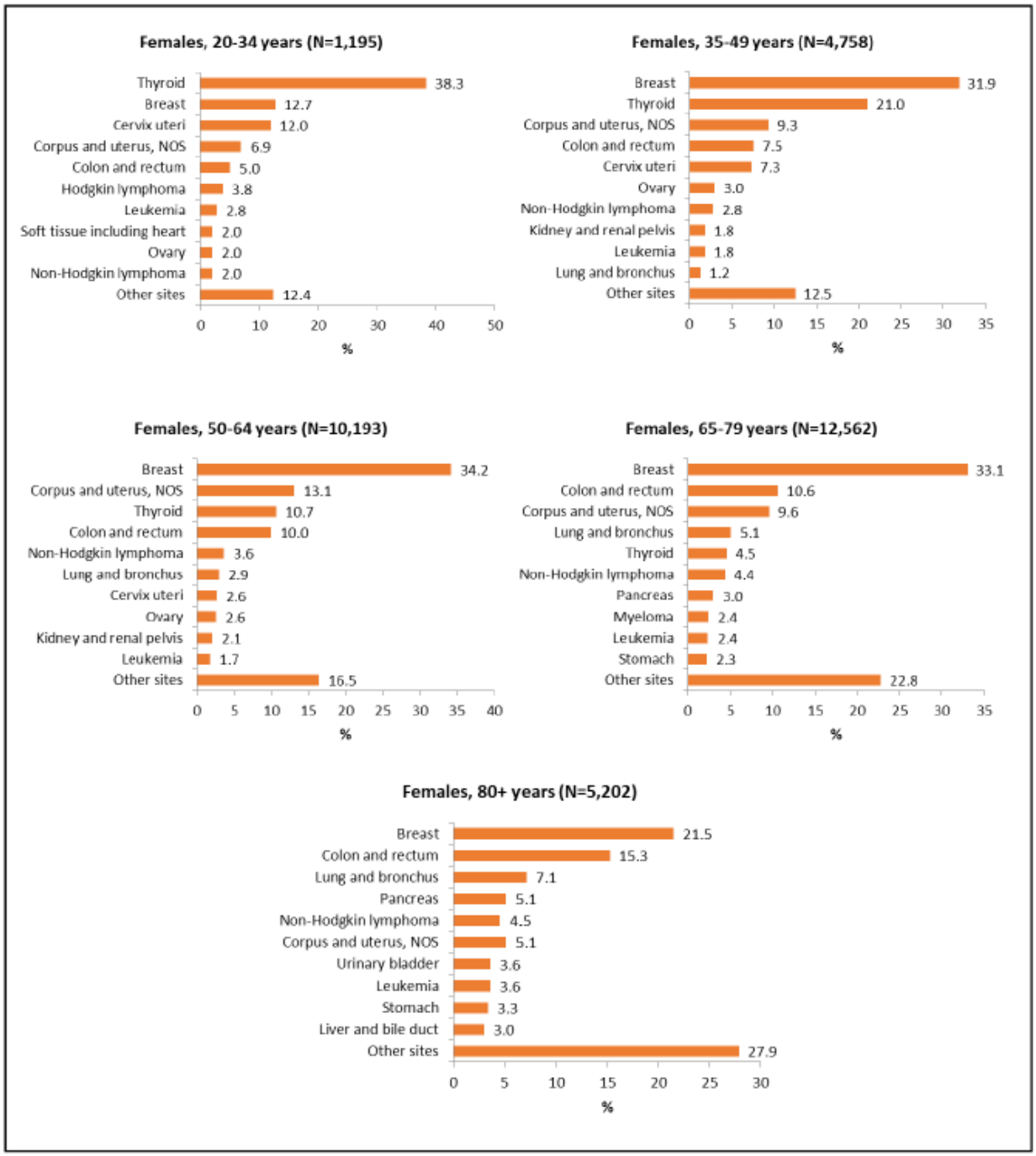
ANNEX III: Complementary tables and figures

Leading incidence cancer sites by age in males, Puerto Rico, 2016 – 2020



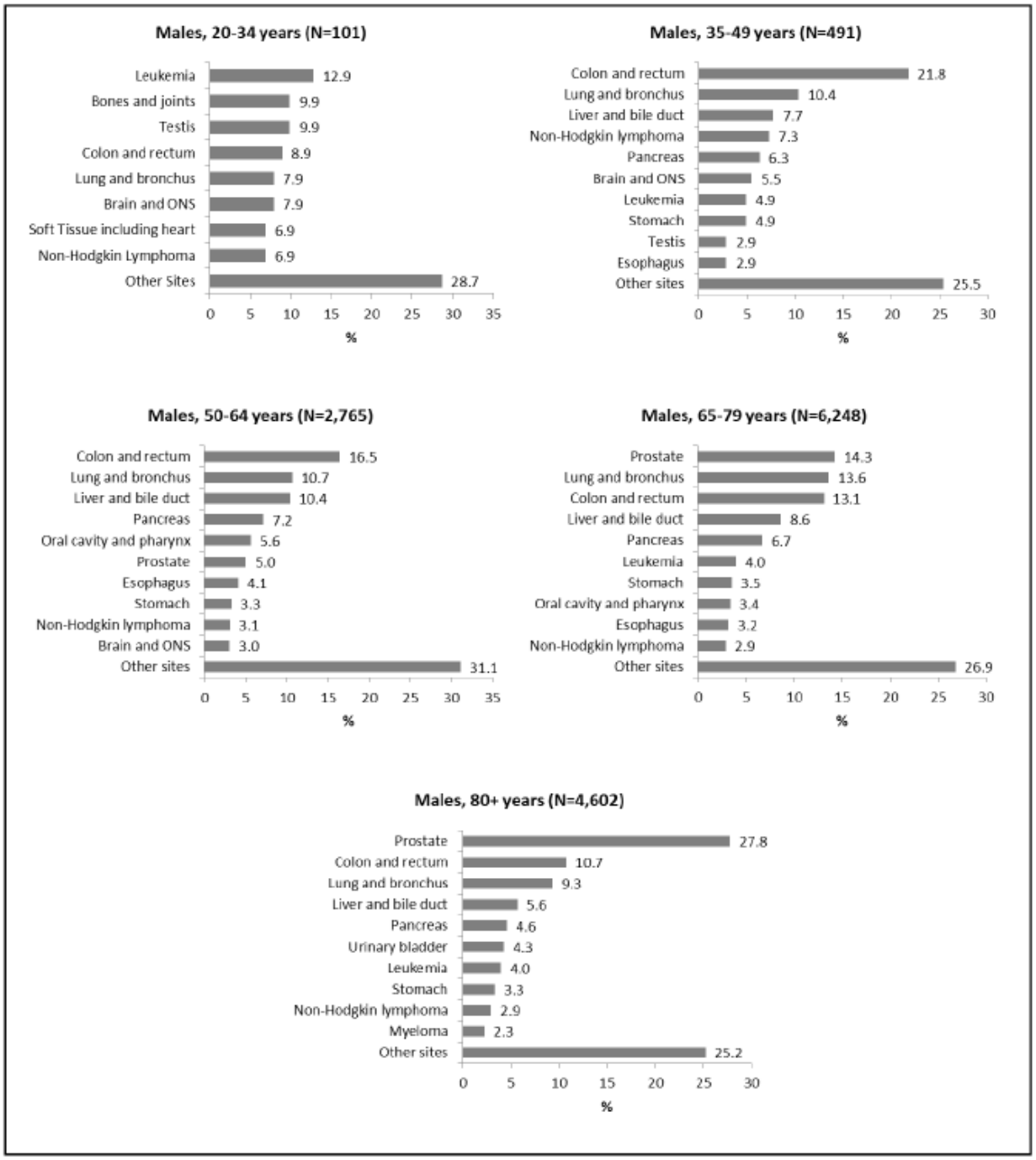
Source. Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry.

Leading incidence cancer sites by age in females, Puerto Rico, 2016 – 2020



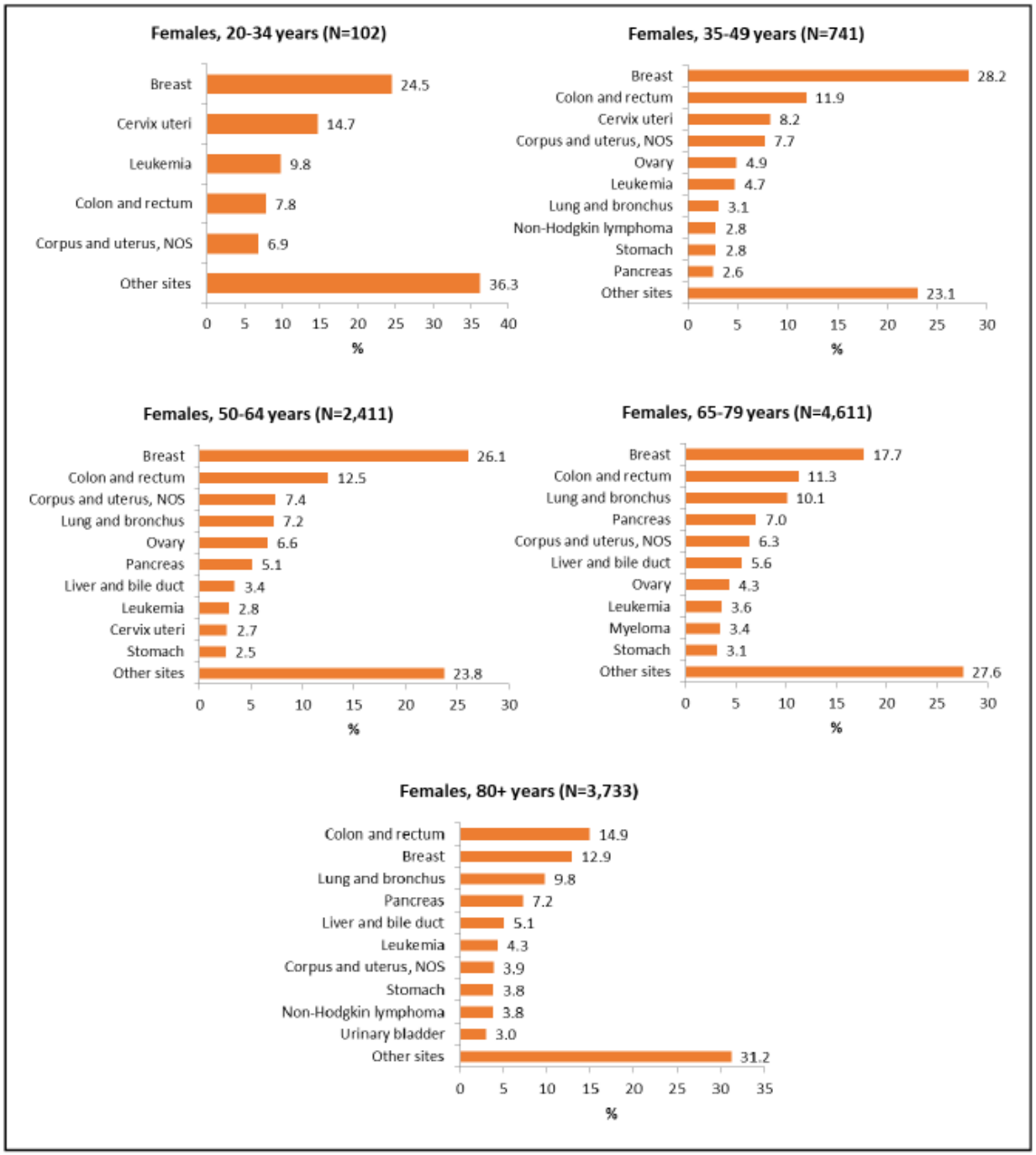
Source. Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry.

Leading mortality cancer sites by age in males, Puerto Rico, 2016 – 2020



Source. Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry.

Leading mortality cancer sites by age in females, Puerto Rico, 2016 – 2020



Source. Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry.

Risk Factor-Associated Cancers

Tobacco-Associated Cancers[6]

Cancer	ICD-O-3 site codes	ICD-O-3 histology codes	Additional restrictions
Lip, oral cavity, pharynx	C00.0–14.8	8000–9049, 9056–9139, 9141–9589	
Esophagus	C15.0–15.9	8000–9049, 9056–9139, 9141–9589	
Stomach	C16.0–16.9	8000–9049, 9056–9139, 9141–9589	
Colon and rectum	C18.0–20.9, C26.0	8000–9049, 9056–9139, 9141–9589	
Liver	C22.0	8000–9049, 9056–9139, 9141–9589	
Pancreas	C25.0–25.9	8000–9049, 9056–9139, 9141–9589	
Larynx	C32.0–32.9	8000–9049, 9056–9139, 9141–9589	
Trachea, lung, bronchus	C33.9–34.9	8000–9049, 9056–9139, 9141–9589	
Cervix uteri	C53.0–53.9	8000–9049, 9056–9139, 9141–9589	Restrict to females
Kidney and renal pelvis	C64.9–65.9	8000–9049, 9056–9139, 9141–9589	
Urinary bladder	C67.0–67.9	8000–9049, 9056–9139, 9141–9589	
Acute myeloid leukemia		9840; 9861; 9865–9869; 9871–9874; 9895–9898; 9910–9911; 9920	

Source. Centers for Disease Control and Prevention. Definitions of risk factor-associated cancers. 2023.

Alcohol-Associated Cancers[2,7]

Cancer	ICD-O-3 site codes	ICD-O-3 histology codes	Additional restrictions
Lip, oral cavity, pharynx	C00.0–14.8	8000–9049, 9056–9139, 9141–9589	
Esophagus	C15.0–15.9	8000–9049, 9056–9139, 9141–9589	
Colon and rectum	C18.0–20.9, C26.0	8000–9049, 9056–9139, 9141–9589	
Liver	C22.0	8000–9049, 9056–9139, 9141–9589	
Larynx	C32.0–32.9	8000–9049, 9056–9139, 9141–9589	
Female breast	C50.0–50.9	8000–9049, 9056–9139, 9141–9589	Restrict to females

Source. Centers for Disease Control and Prevention. Definitions of risk factor-associated cancers. 2023.

Human Papillomavirus-Associated Cancers[3, 8–11]

Cancer	ICD-O-3 site codes	ICD-O-3 histology codes	Additional restrictions
Oropharyngeal squamous cell carcinoma	C01.9, 02.4, 02.8, 05.1–05.2, 09.0–09.1, 09.8–09.9, 10.0–10.4, 10.8–10.9, 14.0, 14.2, 14.8	8050–8086, 8120–8131	Restrict to microscopically confirmed
Anal and rectal squamous cell carcinoma	C21.0–21.8, 20.9	8050–8084, 8120–8131	Restrict to microscopically confirmed
Vulvar squamous cell carcinoma	C51.0–51.9	8050–8084, 8120–8131	Restrict to females and restrict to microscopically confirmed
Vaginal squamous cell carcinoma	C52.9	8050–8084, 8120–8131	Restrict to females and restrict to microscopically confirmed
Cervical carcinoma	C53.0–53.9	8010–8671, 8940–8941	Restrict to females and restrict to microscopically confirmed
Penile squamous cell carcinoma	C60.0–60.9	8050–8084, 8120–8131	Restrict to males and restrict to microscopically confirmed

Source. Centers for Disease Control and Prevention. Definitions of risk factor-associated cancers. 2023.

Obesity-Associated Cancers[4, 5, 12]

Cancer	ICD-O-3 site codes	ICD-O-3 histology codes	Additional restrictions
Esophageal adenocarcinoma	C15.0–15.9	8140–8575	Restrict to microscopically confirmed
Gastric cardia	C16.0	8000-9049, 9056–9139, 9141–9589	
Colon and rectum	C18.0–20.9, C26.0	8000–9049, 9056–9139, 9141–9589	
Liver	C22.0	8000–9049, 9056–9139, 9141–9589	
Gallbladder	C23.9	8000–9049, 9056–9139, 9141–9589	
Pancreas	C25.0–25.9	8000–9049, 9056–9139, 9141–9589	

Source. Centers for Disease Control and Prevention. Definitions of risk factor-associated cancers. 2023.

Obesity-Associated Cancers[4, 5, 12]

Cancer	ICD-O-3 site codes	ICD-O-3 histology codes	Additional restrictions
Multiple myeloma	C42.1	9732	
Postmenopausal female breast	C50.0–50.9	8000–9049, 9056–9139, 9141–9589	Restrict to females and restrict to age ≥50 years
Corpus and uterus, NOS (not otherwise specified)	C54.0–54.9, C55.9	8000–9049, 9056–9139, 9141–9589	Restrict to females
Ovary	C56.9	8000–9049, 9056–9139, 9141–9589	Restrict to females
Kidney	C64.9	8000–9049, 9056–9139, 9141–9589	
Meningioma	C70.0-70.1, 70.9	9530-9539	
Thyroid	C73.9	8000–9049, 9056–9139, 9141–9589	

Source. Centers for Disease Control and Prevention. Definitions of risk factor-associated cancers. 2023.

Physical Inactivity-Associated Cancers[5, 12]

Cancer	ICD-O-3 site codes	ICD-O-3 histology codes	Additional restrictions
Colon	C18.0–18.9, C26.0	8000–9049, 9056–9139, 9141–9589	
Postmenopausal female breast	C50.0–50.9	8000–9049, 9056–9139, 9141–9589	Restrict to females and restrict to age ≥50 years
Corpus and uterus, NOS (not otherwise specified)	C54.0–54.9, C55.9	8000–9049, 9056–9139, 9141–9589	Restrict to females

Source. Centers for Disease Control and Prevention. Definitions of risk factor-associated cancers. 2023.

Cervical cancer screening guidelines by ACS, USPSTF, and ACOG (average-risk women)

	ACS 2021	USPSTF 2018 endorse ACOG 2021
Age to start	***Age 25***	***Age 21***
Women 21-24 years	Not recommended.	***Women 21 to 29 years*** ▪ Cytology alone every 3 years.
Women 25-65 years	FDA-approved primary hrHPV testing every 5 years OR co-testing (combine hrHPV test with a Papanicolaou (Pap) test every 5 years OR a Pap test alone every 3 years.	***Women 30 to 65 years*** ▪ Cytology alone every 3 years OR FDA-approved primary hrHPV testing alone OR co-testing (hrHPV testing in combination with cytology) every 5 years.
Women > 65 years	Stop screening: ▪ if have had regular screening in the past 10 years with normal results and no history of pre-cancer or more serious diagnosis (CIN2 or +) within the past 25 years.	No screening recommended adequate negative prior results and are not otherwise at high risk for cervical cancer.
Total hysterectomy	Stop screening: ▪ if have had a total hysterectomy and it reason was not due to treatment for cervical pre-cancer or cancer. Continue screening: ▪ if have had a hysterectomy without removal of the cervix.	No screening recommended for those who have had a hysterectomy with removal of the cervix and do not have a history of a high-grade precancerous lesion (i.e., cervical intraepithelial neoplasia [CIN] grade 2 or 3) or cervical cancer.
Screening among HPV vaccinated	Must follow screening guidelines of the corresponding age group.	Not reviewed.

Sources: ACOG, 2021; ACS, 2021; USPSTF, 2018.

Breast cancer screening guidelines by ACS and USPSTF (average-risk women)

Exam/ Procedure	**ACS 2023**	**USPSTF 2024**
Mammography (low-dose x-rays of the breast)	***Women 40-44 years*** ▪ Optional (annual). ***Women 45-54 years*** ▪ Annual ***Women > 54 years*** ▪ Can switch from annual to every other year or can choose to continue yearly mammograms.	***Women 40 to 74 years*** ▪ Biannual ***Women 50 to 74 years*** ▪ Biannual Women > 74 years ▪ Insufficient evidence regarding the balance of benefits and harms.
Clinical Breast Exam (CBE)	▪ Not recommended at any age.	▪ Not reviewed.
Other methods (i.e., breast ultrasonography, magnetic resonance imaging)	▪ Not reviewed.	***Women with dense breasts*** ▪ Insufficient evidence regarding the balance of benefits and harms of supplemental screening (i.e., breast ultrasonography or MRI on an otherwise negative screening mammogram.

*Note. Women who are at **high risk** should get a breast MRI and a mammogram every year, typically starting at age 30.*

Source: ACS, 2023; USPSTF, 2024.

Colorectal cancer screening guidelines by ACS and USPSTF (average risk population)

Exam/ Procedure	ACS, 2024 Men & Women 45-75 years[a] Frequency	USPSTF, 2021 Men & Women 50-75 years[b] Frequency
Fecal immunochemical test (FIT)	▪ Annual	▪ Annual
Fecal occult blood test (gFOBT)	▪ Annual	▪ Annual
Fecal DNA test	▪ Every 3 years	No recommendation provided. Instead recommend the use of sDNA-FIT test every 1 to 3 years.
Colonoscopy	▪ Every 10 years	▪ Every 10 years
CT colonography (virtual colonoscopy)	▪ Every 5 years	▪ Every 5 years
Flexible sigmoidoscopy (FSIG)	▪ Every 5 years	▪ Every 5 years Also recommends the use of flexible sigmoidoscopy every 10 y + FIT every year.

[a] For those 76-85 years, the decision to be screened should be based on a person's preferences, life expectancy, overall health, and prior screening history, whereas for those over 85, it is not recommended.
[b] For those 45-49 years it is also recommended colon cancer screening (grade B) with a moderate net benefit. For those 76-85 years it is recommended that clinicians selectively offer screening.
Note: People are at average risk if they do not have: personal history of colorectal cancer or certain types of polyps, family history of colorectal cancer, personal history of inflammatory bowel disease, confirmed or suspected hereditary colorectal cancer syndrome, such as familial adenomatous polyposis, or Lynch syndrome, personal history of getting radiation to the abdomen or pelvic area to treat a prior cancer
Source: ACS, 2024; USPSTF, 2021.

Lung cancer screening guidelines by ACS, USPSTF, American Academy of Family Physicians (AAFP), American College of Chest Physicians (ACCP) (average risk population)

Exam/ Procedure	ACS, 2023 & USPSTF 2021, AAFP, ACCP Men & Women 50-80 years who smoke or used of smoke and have at least 20 pack-year smoking history. Frequency
Low-dose computed tomography (LD-CT)	▪ Annual Stop screening if a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have a lung surgery.
Other	▪ Receive smoking cessation counseling.

Source: ACS, 2023; USPSTF, 2021.

1-, 3- , and 5-year relative survival percentage for specific cancer sites by tumor stage, Puerto Rico, 2012 – 2016 (follow-up to 2021)

Cancer site	Total cases	1-year survival (95% CI)	3-year survival (95% CI)	5-year survival (95% CI)
Oral cavity and pharynx	1,727	75.04 (72.84-77.10)	56.65 (54.11-59.13)	52.52 (49.87-55.12)
Localized	456	88.88 (85.37-91.70)	78.95 (74.42-82.94)	75.37 (70.39-79.88)
Regional	664	75.21 (71.61-78.46)	53.26 (49.15-57.24)	47.43 (43.22-51.58)
Distant	285	59.46 (53.38-65.05)	29.73 (24.34-35.34)	24.01 (18.95-29.48)
Unknown	322	68.83 (63.27-73.80)	55.93 (49.90-61.64)	55.99 (49.64-62.07)
Esophagus	539	43.46 (39.15-47.71)	20.90 (17.42-24.62)	16.57 (13.34-20.13)
Localized	163	51.23 (43.10-58.85)	29.55 (22.37-37.18)	25.69 (18.69-33.40)
Regional	112	57.63 (47.71-66.44)	27.77 (19.52-36.74)	20.13 (12.88-28.70)
Distant	120	28.14 (20.31-36.49)	8.03 (3.95-14.04)	5.71 (2.34-11.35)
Unknown	144	36.46 (28.52-44.47)	16.58 (10.82-23.48)	12.69 (7.59-19.25)
Stomach	1,321	51.40 (48.60-54.13)	36.50 (33.76-39.25)	32.63 (29.89-35.41)
Localized	417	67.15 (62.23-71.64)	58.33 (53.03-63.35)	54.88 (49.33-60.23)
Regional	370	57.33 (51.99-62.34)	28.15 (23.45-33.04)	20.72 (16.48-25.36)
Distant	306	21.11 (16.67-25.93)	8.44 (5.58-12.06)	5.22 (2.99-8.36)
Unknown	228	53.72 (46.85-60.15)	47.94 (40.93-54.71)	48.17 (40.91-55.25)
Colon and rectum	7,634	83.39 (82.48-84.26)	70.76 (69.62-71.89)	64.54 (63.29-65.78)
Localized	3,133	94.38 (93.37-95.28)	89.98 (88.56-91.30)	86.88 (85.18-88.48)
Regional	2,771	85.77 (84.31-87.13)	71.20 (69.28-73.05)	62.29 (60.18-64.34)
Distant	1,201	51.53 (48.60-54.38)	22.83 (20.42-25.33)	14.06 (12.06-16.22)
Unknown	529	78.12 (74.16-81.61)	63.82 (59.18-68.17)	59.20 (54.29-63.90)
Liver and intrahepatic bile duct	964	42.10 (38.91-45.27)	23.59 (20.84-26.44)	18.32 (15.78-21.02)
Localized	360	52.95 (47.54-58.10)	37.58 (32.32-42.87)	29.75 (24.75-34.98)
Regional	128	43.98 (35.12-52.54)	19.17 (12.69-26.75)	15.73 (9.75-23.11)
Distant	146	23.17 (16.61-30.40)	8.04 (4.26-13.40)	6.11 (2.86-11.14)
Unknown	330	37.91 (32.59-43.24)	16.92 (12.95-21.37)	12.26 (8.80-16.34)

Source. Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry.

1-, 3- , and 5-year relative survival percentage for specific cancer sites by tumor stage, Puerto Rico, 2012 – 2016 (follow-up to 2021), cont.

Cancer site	Total cases	1-year survival (95% CI)	3-year survival (95% CI)	5-year survival (95% CI)
Pancreas	1,155	32.95 (30.21-35.72)	16.70 (14.54-18.99)	13.64 (11.64-15.81)
Localized	155	52.85 (44.53-60.56)	40.29 (32.23-48.30)	35.17 (27.31-43.24)
Regional	336	48.67 (43.12-54.01)	20.50 (16.23-25.16)	16.32 (12.41-20.74)
Distant	577	18.08 (15.02-21.38)	6.99 (5.05-9.35)	4.95 (3.32-7.05)
Unknown	87	35.33 (25.32-45.52)	24.25 (15.63-34.02)	22.51 (14.06-32.32)
Lung and bronchus	2,618	44.83 (42.87-46.77)	27.93 (26.14-29.75)	22.58 (20.88-24.34)
Localized	524	72.57 (68.37-76.35)	58.19 (53.50-62.65)	50.75 (45.90-55.49)
Regional	493	55.39 (50.77-59.79)	32.36 (28.06-36.76)	24.40 (20.42-28.63)
Distant	1,227	28.07 (25.55-30.66)	12.56 (10.71-14.57)	9.24 (7.61-11.06)
Unknown	374	47.04 (41.78-52.14)	30.12 (25.31-35.12)	24.53 (19.94-29.44)
Female breast	9,130	96.57 (96.11-96.99)	90.88 (90.14-91.58)	86.84 (85.96-87.69)
Localized	5,257	99.75 (99.37-100.06)	98.41 (97.72-99.03)	96.93 (96.02-97.77)
Regional	2,782	96.86 (96.03-97.56)	87.54 (86.08-88.89)	80.19 (78.43-81.86)
Distant	472	70.62 (66.20-74.60)	42.70 (38.07-47.28)	31.53 (27.22-35.96)
Unknown	619	88.04 (85.04-90.53)	78.71 (74.90-82.11)	73.52 (69.32-77.38)
Cervix uteri	1,100	86.91 (84.72-88.82)	72.48 (69.65-75.12)	67.63 (64.64-70.45)
Localized	455	95.08 (92.54-96.84)	88.08 (84.54-90.95)	85.25 (81.35-88.51)
Regional	327	86.55 (82.26-89.91)	62.74 (57.12-67.88)	54.81 (49.05-60.24)
Distant	93	49.83 (39.25-59.55)	20.80 (13.18-29.65)	17.65 (10.62-26.16)
Unknown	225	86.21 (80.82-90.26)	76.44 (70.01-81.81)	71.24 (64.40-77.17)
Corpus and uterus, NOS	2,826	93.16 (92.09-94.10)	84.72 (83.20-86.13)	81.52 (79.84-83.11)
Localized	1,855	97.62 (96.68-98.36)	94.08 (92.65-95.32)	91.89 (90.20-93.40)
Regional	566	90.53 (87.66-92.83)	74.13 (70.06-77.80)	68.83 (64.47-72.85)
Distant	154	63.74 (55.50-70.91)	31.55 (24.23-39.15)	25.28 (18.53-32.61)
Unknown	251	84.09 (78.75-88.28)	71.76 (65.38-77.31)	67.72 (61.00-73.74)

Source. Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry.

1-, 3- , and 5-year relative survival percentage for specific cancer sites by tumor stage, Puerto Rico, 2012 – 2016 (follow-up to 2021), cont.

Cancer site	Total cases	1-year survival (95% CI)	3-year survival (95% CI)	5-year survival (95% CI)
Ovary	753	74.68 (71.33-77.71)	57.36 (53.60-60.95)	49.50 (45.69-53.22)
Localized	163	95.86 (91.16-98.3)	90.5 (84.35-94.66)	84.34 (77.14-89.79)
Regional	171	83.48 (76.82-88.47)	68.9 (61.04-75.64)	62.46 (54.25-69.8)
Distant	370	64.17 (58.97-68.93)	39.38 (34.24-44.49)	29.12 (24.38-34.04)
Unknown	49	52.1 (37.13-65.26)	41.24 (26.94-55.33)	40.77 (26.16-55.46)
Prostate	14,046	99.81 (99.52-100.00)	99.67 (99.17-100.00)	99.71 (99.06-100.00)
Localized	10,158	100	100	100
Regional	731	100	100	100
Distant	377	77.47 (72.63-81.66)	54.13 (48.49-59.53)	38.33 (32.83-43.92)
Unknown	2,780	98.38 (97.51-99.11)	96.31 (94.92-97.58)	95.82 (94.08-97.44)
Urinary bladder	1,652	86.76 (84.85-88.49)	76.54 (74.04-78.91)	70.90 (68.07-73.63)
In situ	754	98.17 (96.35-99.49)	94.41 (91.48-96.89)	88.51 (84.73-91.91)
Localized	691	82.37 (79.07-85.27)	66.55 (62.41-70.45)	61.38 (56.89-65.70)
Regional	81	71.40 (59.73-80.52)	53.21 (40.83-64.63)	38.60 (26.79-50.89)
Distant	58	37.30 (24.85-49.85)	14.92 (6.98-25.84)	13.73 (6.03-24.83)
Unknown	68	65.20 (52.20-75.73)	59.65 (45.92-71.62)	58.78 (44.27-71.88)
Kidney and renal pelvis	1,431	88.61 (86.73-90.27)	84.24 (81.95-86.33)	82.03 (79.49-84.40)
Localized	994	98.09 (96.72-99.09)	97.28 (95.36-98.84)	96.10 (93.71-98.13)
Regional	205	82.58 (76.39-87.42)	74.37 (67.20-80.46)	69.30 (61.59-76.13)
Distant	154	43.60 (35.57-51.38)	25.13 (18.42-32.42)	19.62 (13.55-26.59)
Unknown	78	72.28 (60.52-81.30)	60.49 (47.94-71.36)	59.30 (46.20-70.97)
Thyroid	4,987	99.95 (99.66-100.00)	100	100
Localized	3,819	100	100	100
Regional	937	99.70 (98.79-100.00)	99.73 (98.47-100.00)	99.72 (98.17-100.00)
Distant	86	86.05 (76.43-92.18)	78.56 (67.61-86.62)	74.43 (62.81-83.54)
Unknown	145	98.95 (94.70-100.00)	97.51 (92.13-100.00)	97.44 (91.43-100.00)

Source. Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry

1-, 3- , and 5-year relative survival percentage for specific cancer sites by tumor stage, Puerto Rico, 2012 – 2016 (follow-up to 2021), cont.

Cancer site	Total cases	1-year survival (95% CI)	3-year survival (95% CI)	5-year survival (95% CI)
Non-Hodgkin lymphoma	2,613	78.10 (76.39-79.70)	71.54 (69.61-73.40)	69.06 (66.98-71.06)
Localized	869	80.08 (77.15-82.71)	73.65 (70.31-76.74)	72.08 (68.52-75.41)
Regional	341	74.09 (68.94-78.58)	68.66 (63.05-73.72)	67.49 (61.59-72.89)
Distant	722	74.47 (71.01-77.62)	64.66 (60.77-68.32)	60.21 (56.11-64.14)
Unknown	681	81.41 (78.12-84.30)	77.60 (73.89-80.96)	75.34 (71.31-79.05)
Leukemia	1,626	75.78 (73.55-77.87)	66.22 (63.69-68.65)	63.25 (60.57-65.84)

Source. Torres-Cintrón CR, Suárez-Ramos, T, Román-Ruiz Y, Ortiz-Ortiz KJ, De Jesús-Monge V, Gierbolini-Bermúdez A, Zavala-Zegarra D, Tortolero-Luna G. Cancer in Puerto Rico, 2016-2020. San Juan, PR. 2023. Puerto Rico Central Cancer Registry

ANNEX IV. Resources

Cancer Patients and Survivors Bill of Rights Act

Ley de la "Carta de Derechos de los Pacientes y Sobrevivientes de Cáncer"

Ley Núm. 275 de 27 de septiembre de 2012, según enmendada

(Contiene enmiendas incorporadas por las siguientes leyes:
Ley Núm. 82 de 15 de mayo de 2018
Ley Núm. 79 de 1 de agosto de 2020
Ley Núm. 165 de 8 de agosto de 2024)

Para establecer la "Carta de Derechos de los Pacientes y Sobrevivientes de Cáncer"; determinar los derechos y responsabilidades con relación a los servicios de salud médico-hospitalarios y otros servicios relacionados; la administración e implementación de programas y asuntos relacionados; el financiamiento; la creación de la Junta Asesora sobre el Cuido y Tratamiento del Paciente y Sobreviviente de Cáncer; y para otros fines relacionados.

EXPOSICION DE MOTIVOS

Ha sido un compromiso de esta Asamblea Legislativa velar por que todo ciudadano disfrute de igual protección de sus derechos a través de la aprobación de leyes. Preocupados por hacer valer los derechos de toda persona que se vea afectada por una enfermedad catastrófica como lo es el cáncer, nos disponemos a dar paso y aprobar una carta de derechos para los pacientes y sobrevivientes de cáncer. Con esto se persigue encaminar a nuestra sociedad a lograr una mayor sensibilidad y conciencia de la necesidad de salvaguardar la dignidad y seguridad de aquellos cuya salud se ve afectada, lo que los hace vulnerables al tener comprometido su sistema inmunológico.

La Ley Núm. 49-2011, mejor conocida como "Ley de Política Pública del Gobierno de Puerto Rico para el Control Comprensivo de Cáncer en Puerto Rico", tiene como objetivo proveer a las instrumentalidades públicas del Gobierno de Puerto Rico un marco legal que ofrezca una estrategia coordinada e integrada para minimizar los estragos de esta enfermedad. Con la creación de esta "Carta de Derechos de los Pacientes y Sobrevivientes de Cáncer" perseguimos establecer una serie de derechos dirigidos a asegurar el bienestar y la protección de todo paciente y sobreviviente de cáncer, sin importar edad, sexo o condición social. Derechos que, como parte de la política pública gubernamental, representan el marco legal que regirá la interacción del Gobierno y del sector privado con este sector poblacional.

Las responsabilidades de los proveedores de servicios de salud y aseguradoras se establecen a la par con las responsabilidades que patronos, escuelas, universidades, entre otros, deben también tener para con este sector. Esta "Carta de Derechos de los Pacientes y Sobrevivientes de Cáncer" reconoce que todos los sobrevivientes de cáncer tienen unas necesidades especiales a la hora de recibir servicios de salud. Por esto, se establecen las reglas que gobernarán la relación paciente/sobreviviente con los proveedores de todo servicio relacionado con este grupo. Un ejemplo de la protección adicional que se da fuera del ámbito de salud es que permite que todo estudiante a nivel universitario, paciente o sobrevivientes de cáncer, pueda continuar desarrollándose como ciudadano y profesional en una institución de enseñanza superior sin que su condición sea óbice para ello. Además, se debe garantizar el acceso a oncólogos, radio oncólogos

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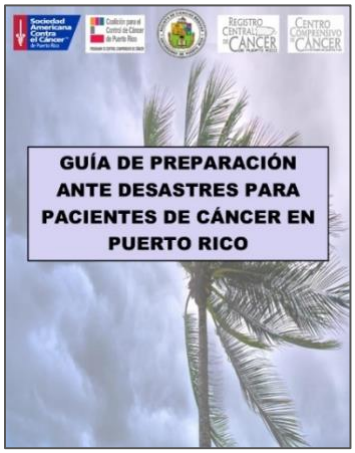
Link:

https://bvirtualogp.pr.gov/ogp/Bvirtual/leyesreferencia/PDF/Derechos%20Civiles/275-2012/275-2012.pdf

QR Code:

Emergency Preparedness Guide for Cancer Patients



Link:

https://rcpr.org/Portals/0/Docs/Boletines/Paciente-Desastres_final.pdf?ver=rkLFtSj-PNapGR7l0BgQ_A%3D%3D

QR Code:

Link:

https://rcpr.org/Portals/0/Docs/Infograficos/Infografia_Desastres_final.pdf?ver=m_Rxi4wwOWTrbXpuHA5MTg%3d%3d

QR Code:

2024 Preparedness Guide with Hospitals, including Oncology Clinics/Treatment Centers

Link:

https://www.salud.pr.gov/CMS/DOWNLOAD/9076

QR Code:

ASCO Cancer Treatment & Survival Plans

ASCO Treatment Plan

This Treatment Plan is a summary of your planned cancer treatment. You can keep it with your health care records and share it with your primary care provider or other doctors and nurses. When treatment is over you will also receive a survivorship care plan that will tell you what happens after treatment is over.

General Information

Patient Name: | Patient DOB:
Patient phone: | Email:
Health Care Providers (including Names, Institution, Phone numbers)
Primary Care Provider:
Surgeon:
Radiation Oncologist:
Medical Oncologist:
Other Providers (Navigator):

Diagnosis

Cancer Type/Location/Histologic type: | Diagnosis Date:
Tumor size: | Lymph Nodes: | Metastasis:
Stage: ☐I ☐II ☐III ☐IV ☐Not available/applicable
Other information about the cancer:

Treatment Plan

Treatment Goal: ☐ To cure the cancer and relieve symptoms and side effects of treatment
☐ To slow the growth of the cancer and relieve symptoms and side effects of treatment

Treatment Plan

Surgery ☐ Yes ☐No | Surgery Date(s) (year): | Procedure/location:
Radiation ☐ Yes ☐No | Body area to be treated: | How many treatments over how many weeks:
Systemic Therapy (chemotherapy, hormonal therapy, other) ☐ Yes ☐No
To be given before surgery or radiation (neoadjuvant) ☐ Yes ☐No
Name of regimen and agents used: | Number of cycles planned and frequency:
To be given after surgery or radiation (adjuvant) ☐ Yes ☐No
Name of regimen and agents used: | Number of cycles planned and frequency:
Additional information:

ASCO Treatment Summary and Survivorship Care Plan

General Information

Patient Name: | Patient DOB:
Patient phone: | Email:
Health Care Providers (including Names, Institution)
Primary Care Provider:
Surgeon:
Radiation Oncologist:
Medical Oncologist:
Other Providers:

Treatment Summary

Diagnosis

Cancer Type/Location/Histology Subtype: | Diagnosis Date (year):
Stage: ☐I ☐II ☐III ☐Not applicable

Treatment

Surgery ☐ Yes ☐No | Surgery Date(s) (year):
Surgical procedure/location/findings:
Radiation ☐ Yes ☐No | Body area treated: | End Date (year):
Systemic Therapy (chemotherapy, hormonal therapy, other) ☐ Yes ☐No
Names of Agents Used | End Dates (year)
Persistent symptoms or side effects at completion of treatment: ☐ No ☐ Yes (enter type(s)) :

Familial Cancer Risk Assessment

Genetic/hereditary risk factor(s) or predisposing conditions:
Genetic counseling: ☐ Yes ☐ No | Genetic testing results:

Follow-up Care Plan

Need for ongoing (adjuvant) treatment for cancer ☐ Yes ☐ No

Additional treatment name	Planned duration	Possible Side effects

Schedule of clinical visits

Coordinating Provider	When/How often

Link:

https://www.cancer.org/cancer/survivorship/long-term-health-concerns/survivorship-care-plans.html

QR Code:

Directory of Organizations (Support to Cancer Survivors and Caregivers)

DIRECTORIO DE ORGANIZACIONES DE AYUDA PARA PACIENTES DE CÁNCER Y SUS FAMILIARES

Link:

https://www.cccupr.org/wp-content/uploads/2015/10/asoc.ayuda-a-pacientes.pdf

QR Code:

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Autorizado por la Oficina del Contralor Electoral OCE-SA-2024-01196

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DEPARTAMENTO DE SALUD

This publication was supported by the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services (HHS) as part of a financial assistance of the FOA 5-U58DP007164-02-00.