

# GUAM CANCER & HEALTH DISPARITIES REPORT 2022



## ACKNOWLEDGEMENTS

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This publication is the first and is made possible by long-time partnerships in cancer control across service providers, researchers, and government and community organizations, and their unwavering dedication to addressing cancer in our populations. This publication is based on Guam cancer data from the Guam Cancer Registry and the Guam Cancer Facts and Figures 2013-2017. Risk factor prevalence data were taken from the Guam Behavioral Risk Factor Surveillance System (BRFSS) administered by DPHSS, the Guam Youth Risk Surveillance System (YRBSS) administered by the Guam Department of Education, and the Guam State Epidemiological Profile 2018 administered by the Guam Behavioral Health and Wellness Center.

The lead author for the report was Harmony Palaganas, COC Research Associate. Angelina G. Mummert, Dr. Lilnabeth P. Somera, and Dr. Tressa P. Diaz oversaw editing and production. Project support was provided by DPHSS GCCCP. The publication was funded by the National Cancer Institute (NCI) of the National Institutes of Health under PACHE Award No. U54CA143728 was awarded to the University of Guam Cancer Research Center, and the Centers for Disease Control and Prevention (CDC) Cooperative Grant Agreement No. 1 NU58DP007176-01-00 awarded to the Guam Department of Public Health and Social Services

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**Letter from the U54 Pacific Island Partnership for Cancer Health Equity (PIPCHÉ) Principal Investigators, Dr. Rachael T. Leon Guerrero and Dr. Margaret Hattori-Uchima**

*Hafa Adai!*

Pacific Islanders and Filipinos, whose communities comprise the majority of Guam's population, remain underserved minorities with high rates of particular cancers, diabetes and cardiovascular disease; and cancer remains the second leading cause of death in Guam. Our underserved communities in Guam have a greater likelihood of developing and dying from certain cancers due to disparities in certain factors such as access to healthcare and lifestyle choices such as tobacco and alcohol use, physical activity, and diet.

This report, put together by the U54 PIPCHÉ Community Outreach Core, helps identify exactly where the cancer health disparities exist and what risk factors play a major role in exacerbating the inequities for our underserved communities in Guam.

We want to thank our partners at the Guam Department of Public Health and Social Services Comprehensive Cancer Control Program, the Guam Cancer Registry, and the Guam Comprehensive Cancer Control Coalition for their ongoing support and collaboration.

*Si yu'os ma'ase,*



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# GUAM

# CANCER & HEALTH DISPARITIES REPORT 2022

*Hafa adai!*

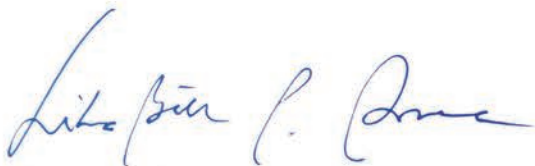
This report on the health and cancer disparities in Guam is a sobering eye-opener about the burden of cancer in our community. Based on the data from the most recent *Guam Cancer Facts and Figures (2013-2017)*, the *2020 Behavioral Risk Factor Surveillance System*, and the 2019 Youth Risk Behavior Survey, the report suggests that more concerted efforts are needed to reduce the burden of cancer in our community. The situation demands resolve and a commitment at both individual and community levels so that we can change course towards a healthier community.

The current state is disheartening, admittedly. In general, while cancer incidence and morbidity have dropped in the United States, both have increased in Guam since the last *Guam Cancer Facts and Figures (2008-2012)* was published. Why we have not seen more meaningful impacts on behavioral risk factors that we, as individuals, and collectively, as a community, can do something about is a very complex issue. The report describes some, certainly not all, the factors that may have affected the health disparities for certain segments of the population as well as some types of cancer.

It is our hope that this report will challenge our community to take a serious look at the data and ask the difficult questions about what it will take to bring about changes at the individual as well as the community level. If we identify the strategies needed to make the changes *and* commit to these changes, we can look forward to significant improvements in these indicators in the next report, and to narrowing the gaps in the health and cancer disparities in our community.

Senseramente,

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## EXECUTIVE SUMMARY

The Pacific Island Partnership for Cancer Health Equity (PIPCHÉ) is a National Cancer Institute-funded partnership between the University of Guam Cancer Research Center and the University of Hawai‘i Cancer Center. PIPCHÉ works to address the cancer disparities that exist for the peoples of Guam, Hawai‘i, and other U.S. Affiliated Pacific Islands. Through their work, they aim to promote cancer health equity and mitigate the impact of cancer on Pacific Island Populations (PIP). The Community Outreach Core (COC) is a core within PIPCHÉ.

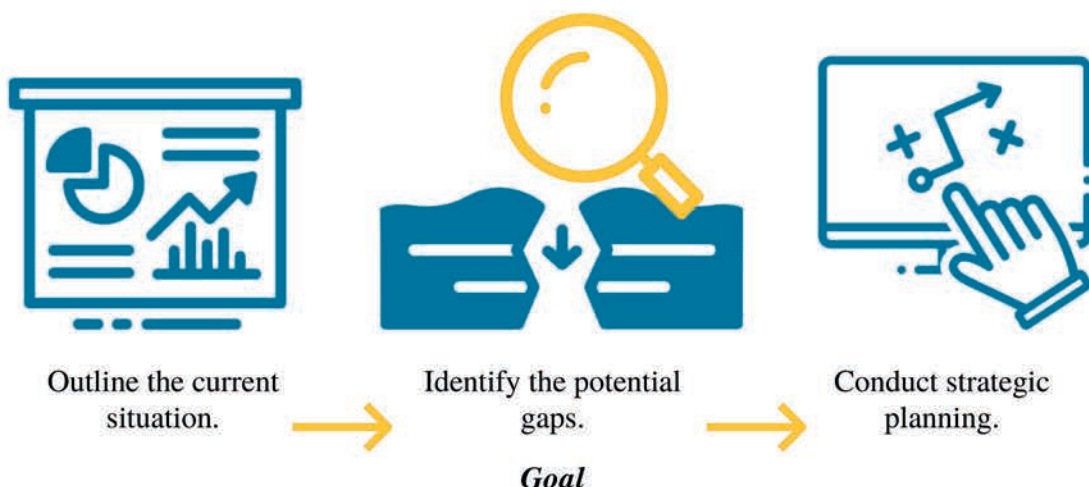
Given the most recently available cancer and lifestyle risk factor data, the COC team created a report in both Guam and Hawai‘i to discuss what this data may tell us about arising and persisting cancer inequities. To do so, COC used the gaps analysis method.

### *What is a gap analysis?*

A gap analysis is “a method of assessing the differences between the actual performance and expected performance in an organization or a business” (QuestionPro, n.d.). This form of analysis may be used to identify the “gaps” in an organization and areas where improvement in performance may be needed to get from one’s current situation to their desired goal.

To conduct a gap analysis, we first outline the current situation of cancer in Guam using the most recently available data on cancer and the related risk factors. This data is primarily derived from the *Guam Cancer Facts & Figures 2013-2017*, the Centers for Disease Control and Prevention (CDC)'s 2020 Behavioral Risk Factor Surveillance Survey (BRFSS) results, and the 2019 Youth Risk Behavior Survey (YRBS) 2019 results. After outlining this information, the report highlights cancers that are prevalent in Guam and populations that may be more vulnerable.

Using this information, we highlight some general ways improvements can be made to close the gaps through cancer outreach, education, and research. We hope this information can be used as a larger conversation on improving the status of cancer in Guam.



It will also assist in examining the gaps in cancer-related community outreach, education, and research. By identifying these gaps we will set goals for improvement through strategic planning with stakeholders and the island community.

# GUAM: DEMOGRAPHICS

### POPULATION

**168,801**

Estimate as of July 2021.

### EDUCATION

**87.3%**

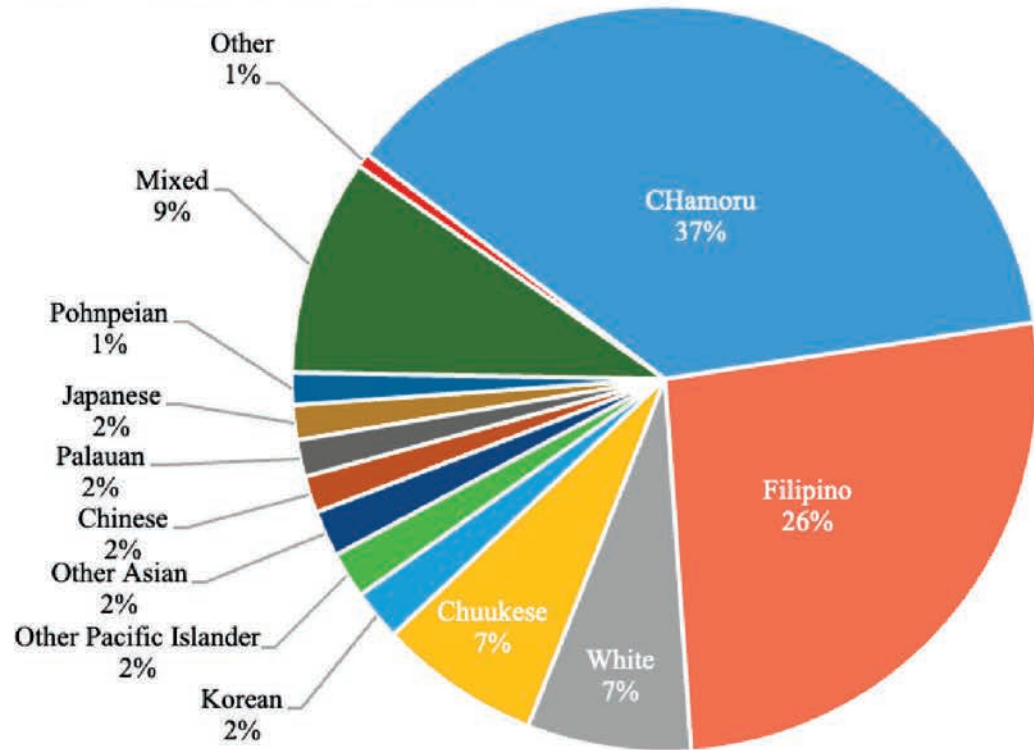
From 2018-2019, the high school graduation rate for the Guam Department of Education was 87.3%.

### AGES

- 0-14 years: 27.22%
- 15-24 years: 16.08%
- 22-54 years: 36.65%
- 55-64 years: 10.5%
- 65 years +: 9.54%

### ETHNIC GROUPS IN GUAM

Figure 1. Ethnic groups in Guam (2010 estimate)



Source: *The World Factbook*

### LIFE EXPECTANCY

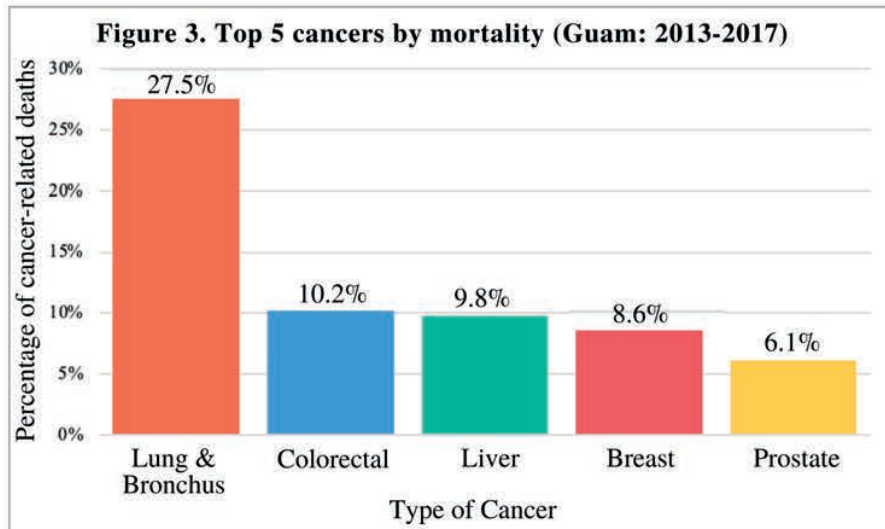
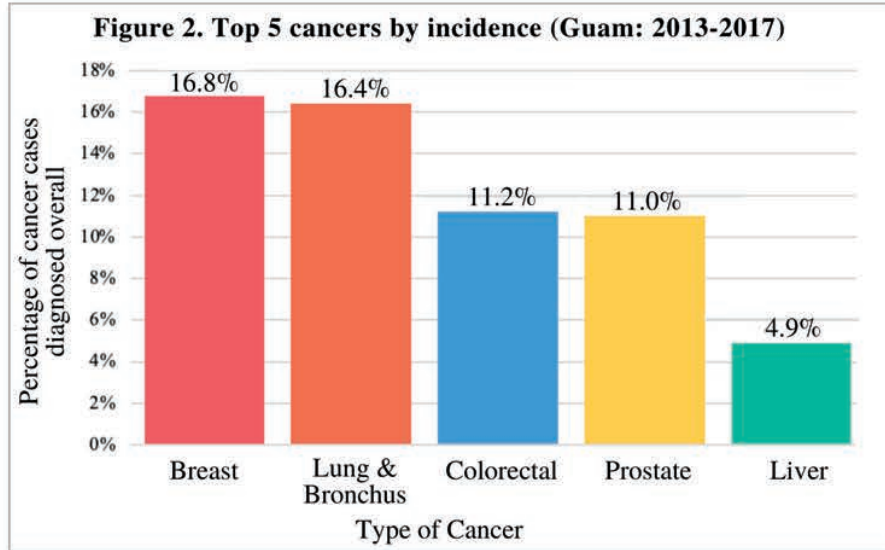
Table 1. Life expectancy by gender (Guam and US, 2017)

Gender	Guam	United States
Male	73.6 years	76.2 years
Female	78.6 years	81.2 years

Source: *The Guam State Epidemiological Profile 2018*



### GUAM: TOP 5 CANCERS



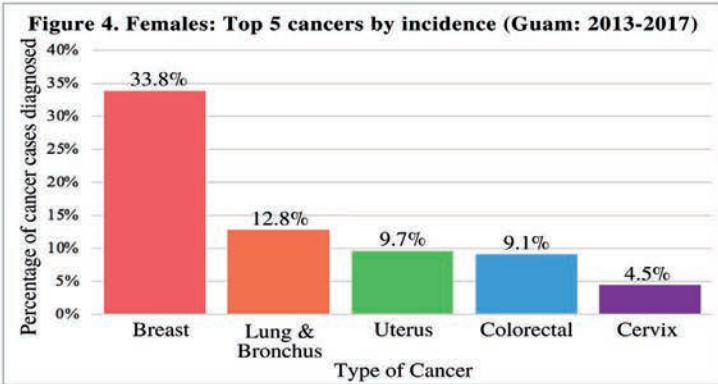
**Table 2. Top 5 cancers by incidence – case count (Guam: 2013-2017)**

Type of Cancer	Number of cases diagnosed overall	Average annual cases diagnosed
Breast	267	53.4
Lung & Bronchus	261	52.5
Colorectal	177	35.4
Prostate	175	35
Liver	78	15.6

**Table 3. Top 5 cancers by mortality – case count (Guam: 2013-2017)**

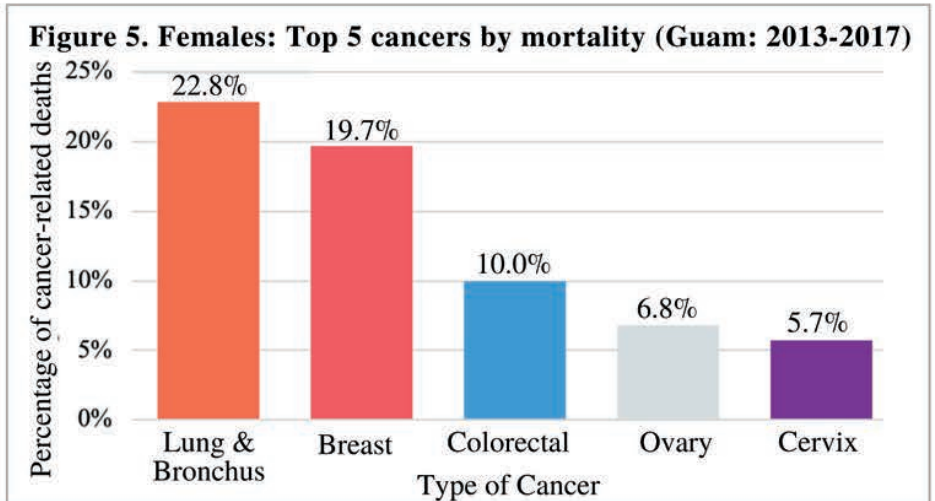
Type of Cancer	Number of deaths overall	Average annual deaths
Lung & Bronchus	222	44.4
Colorectal	82	16.4
Liver	79	15.8
Breast	69	13.8
Prostate	49	9.8

### TOP 5 CANCERS: FEMALE



#### Current situation:

- Between 2013-2017, there were 783 new cancer cases diagnosed in females and 351 cancer-related deaths.
- Breast, lung & bronchus, colorectal, and cervical cancers were ranked as part of the top 5 leading causes of cancer incidence and mortality for females in Guam. From 2013 to 2017, these cancers were listed as some of the most frequently diagnosed and leading causes of cancer-related deaths.



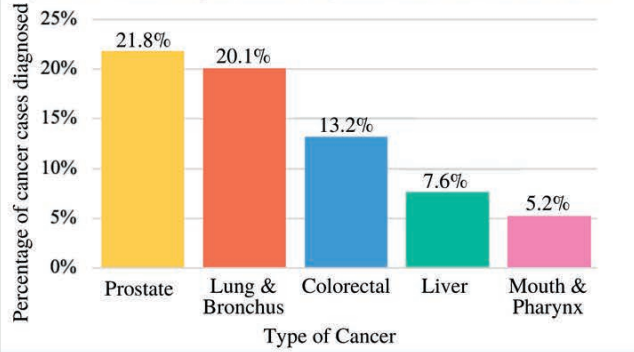
- A third of the new cancer cases diagnosed in females (**33.8%**) were breast cancer cases. The percentage of newly diagnosed breast cancer cases was about 2.6 times greater than lung & bronchus cancer cases (**12.8%**) (Figure 4).
- Lung & bronchus cancer (**22.8%**) were the leading cause of cancer-related deaths in females. It was about 1.2 times greater than breast cancer (**19.7%**), the second leading cause of cancer-related death in females (Figure 5).

#### Potential gaps:

- Breast cancer was the most frequently diagnosed cancer in females and the second leading cause of death. This cancer should continue to be a focal point for research and community engagement. Community outreach should continue promoting mammograms for women between 50 and 74 years old.
- Lung & bronchus cancers were the most common cause of cancer-related deaths in females and overall in Guam. Screening using low-dose computed tomography (LDCT) should be promoted to eligible females.
- Uterine cancer was the third most common cancer diagnosed in females (**9.7%**) and the ninth (**3.1%**) leading cause of cancer-related deaths in females. This should be a concern, as no screening test is available for women at average risk.
  - Outreach should educate females about the signs, symptoms, and genetic factors that may put them at greater risk for uterine cancer. Awareness may help earlier detection of this cancer.
- Cervical cancer was the fifth most common cancer diagnosed (**4.5%**) and the fifth leading cause of cancer-related deaths (**5.7%**) in females. Given the frequency of diagnosis and deaths, community outreach should promote screening for all women 21 to 65 years old. The human papillomavirus (HPV) vaccine should also be encouraged.

### TOP 5 CANCERS: MALE

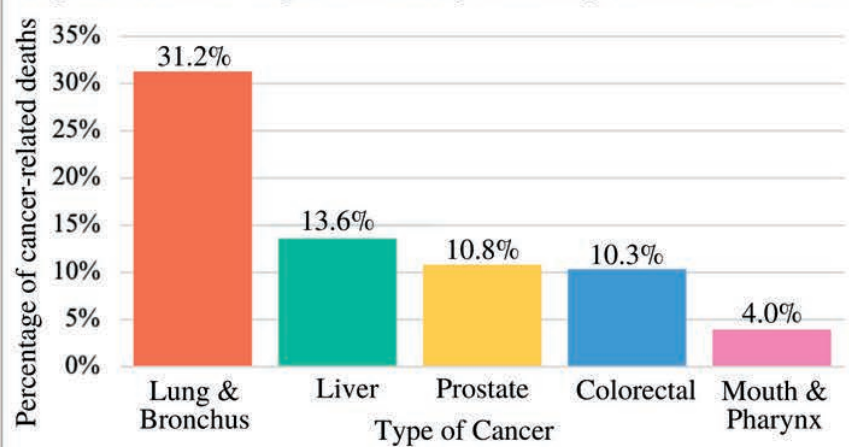
Figure 6. Males: Top 5 cancers by incidence (Guam: 2013-2017)



#### Current situation:

- Between 2013 and 2017, 804 new cancer cases were diagnosed and 455 cancer-related deaths occurred among men.
- From 2013-2017, the top five cancers for both incidence and mortality were the same.
  - From 2013 to 2017 in Guam, prostate (21.8%) and lung & bronchus (20.1%) cancers each accounted for about 1/5 of new cancer cases diagnosed in males (Figure 6).
  - Lung & bronchus cancer was the leading cause of cancer-related deaths (31.2%). It was about 2.3 times greater than liver cancer (13.6%), the second leading cause of cancer-related deaths in males (Figure 7).

Figure 7. Males: Top 5 cancers by mortality (Guam: 2013-2017)



#### Potential gaps:

- Compared to females (351), males (455) experienced 104 more cancer-related deaths. One may examine what factors led to higher mortality in males.
  - One factor may be cigarette smoking. The *Guam State Epidemiological Profile 2018* reported that 28.3% of adult males compared to 15.2% of females in Guam smoke. Smoking is still prevalent in Guam. Educational efforts should continue educating the community on the cancer-related risks of tobacco consumption and cigarette smoking.
  - Another possible factor is alcohol consumption. According to the *Guam State Epidemiological Report 2018*, binge drinking (27.5% of males vs. 8.4% of females) and heavy drinking (11.0% of males vs. 3.8% of females) are more prevalent among males.
- Lung & bronchus, prostate, liver, colorectal, and mouth & pharynx cancers were the most frequently diagnosed and leading causes of cancer-related deaths for males. These cancers should be prioritized for community outreach and research on male populations.
- Screenings for lung & bronchus, prostate, and colorectal cancer should be promoted to the eligible male populations.
- It is concerning that liver cancer incidence and mortality is prevalent in males, yet no screening tests are available for those at average risk. Community members, especially males, should be educated on the factors that lead to an individual being at higher risk for liver cancer. There may be tests to help detect this cancer. The hepatitis B vaccine should also be promoted as cancer prevention.

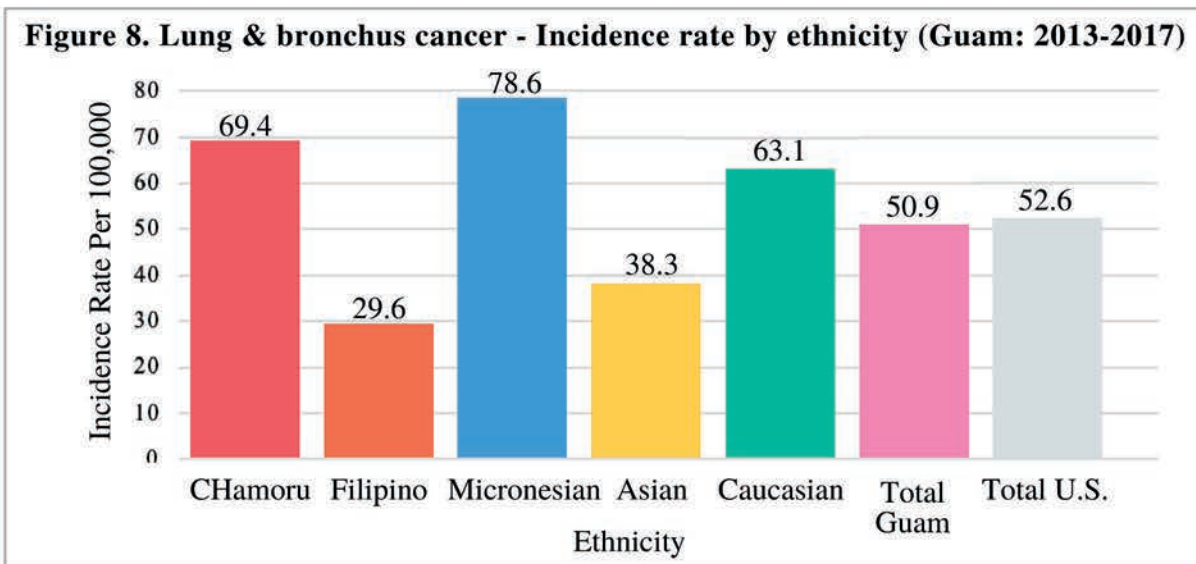
### TOP 5 CANCERS: INCIDENCE RATE BY ETHNICITY

All cancer data in this section was obtained from the *Guam Cancer Facts & Figures 2013-2017*. It is essential to recognize over the past 15 years, there has been a shift in the way data has been reported. Notably, previous *Guam Cancer Facts & Figures* publications used data from the Guam Cancer Registry. However, the most recent version uses data from the Pacific Regional Central Center Registry (PRCCR). The most recent publication also differs as it only includes invasive species; in-situ cases were not counted. This change in criteria may have affected the number of cases reported between 2013 to 2017. Therefore, the data presented in this section gives a general but not precise idea of the cancer trends.

This report highlights the incidence rate by ethnicity for the top five cancers in Guam between 2013 to 2017. The average incidence rate for Guam and the United States is also included. All incidence rates are per 100,000 and age-adjusted to the 2000 U.S. standard population.

### LUNG & BRONCHUS CANCER

Lung and bronchus cancers have maintained their ranking as the second most common cancer diagnosed and the leading cause of cancer-related deaths in Guam.



**Current situation:**

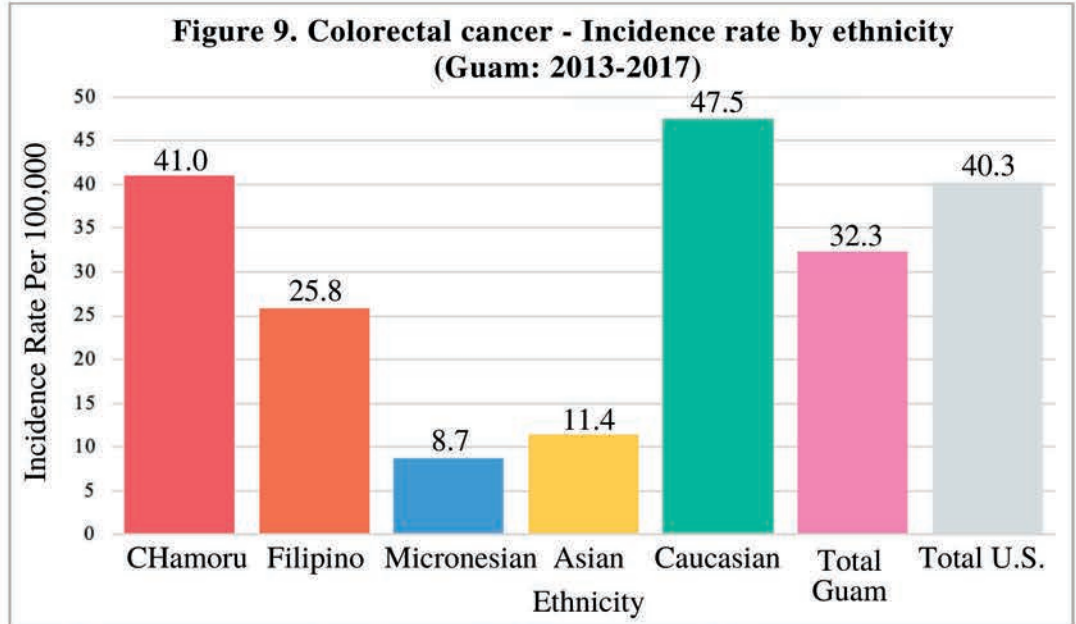
- From 2013 to 2017, Guam’s total lung & bronchus cancer incidence rate (**50.9**) remained slightly lower than the average U.S. total incidence rate (**52.6**) (Figure 8).
- Ethnic groups in Guam whose incidence rates surpassed the averages for Guam (**50.9**) and the United States (**52.6**) include CHamoru (**69.4**), Micronesians (**78.6**), and Caucasian (**63.1**) populations.
- The Micronesians population had the highest incidence rate among ethnic groups in Guam.
  - The rate for Micronesians (**78.6**) was about 2.6 times greater than the rate for Filipinos (**29.6**) and about 2 times greater than the rate for Asians.
- After Micronesians, CHamorus (**69.4**) and Caucasians (**63.1**) had the highest incidence rates among ethnic groups and in comparison to the average rates for the U.S. and Guam.
- The incidence rate for Filipinos (**29.6**) and Asians (**38.3**) was relatively low among ethnic groups in Guam, and the total averages for the U.S. and Guam.
  - Filipinos had the lowest lung & bronchus cancer incidence rate among ethnic groups in Guam.

### COLORECTAL CANCER

Colorectal cancer (CRC) was the third most commonly diagnosed cancer and the second leading cause of cancer-related deaths in Guam.

**Current situation:**

- From 2013 to 2017, the average colorectal cancer incidence rate in Guam overall (32.3) was lower than the U.S. total incidence rate (40.3) (Figure 9).
- Among the ethnic groups in Guam, the colorectal cancer incidence rate for CHamorus (41.0) and Caucasians (47.5) was higher than the average rates for the U.S. (40.3) and Guam (32.3).
  - The incidence rate for



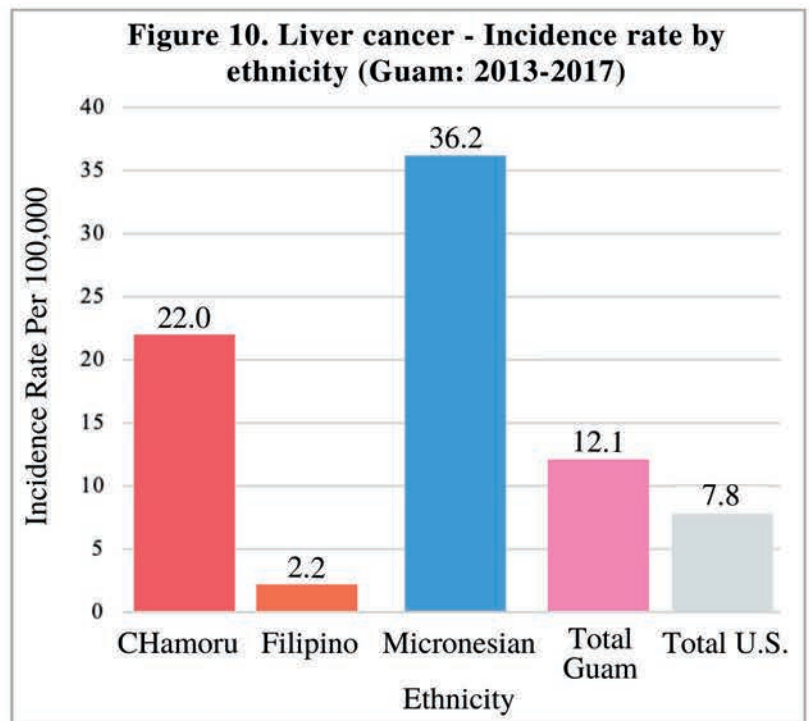
Caucasians (47.5) was about 5.5 times greater than the rate for Micronesians (8.7), the ethnic group with the lowest incidence rate.

### LIVER CANCER

In Guam, liver cancer was the fifth most common cancer diagnosed and the third leading cause of cancer-related deaths.

**Current situation:**

- From 2013 to 2017, the liver cancer incidence rate for Guam (12.1) was about 1.5 times greater than the average U.S. total incidence rate (7.8) (Figure 10).
- For the ethnic groups with available data, the liver cancer incidence rates for CHamoru (22.0) and Micronesian (36.2) populations were significantly higher than the rates for Filipinos (2.2) and the average rates for the United States (7.8) and Guam (12.1).
- Among the populations with available data, the Micronesian community had the highest liver cancer incidence rate (36.2). Compared to other ethnic groups, the frequency of liver cancer diagnosis is disproportionately higher relative to other ethnic groups.
  - The incidence rate for Micronesians was about 16.5 times greater than the rate for Filipinos (2.2), who had the lowest incidence rate among ethnic groups in Guam.



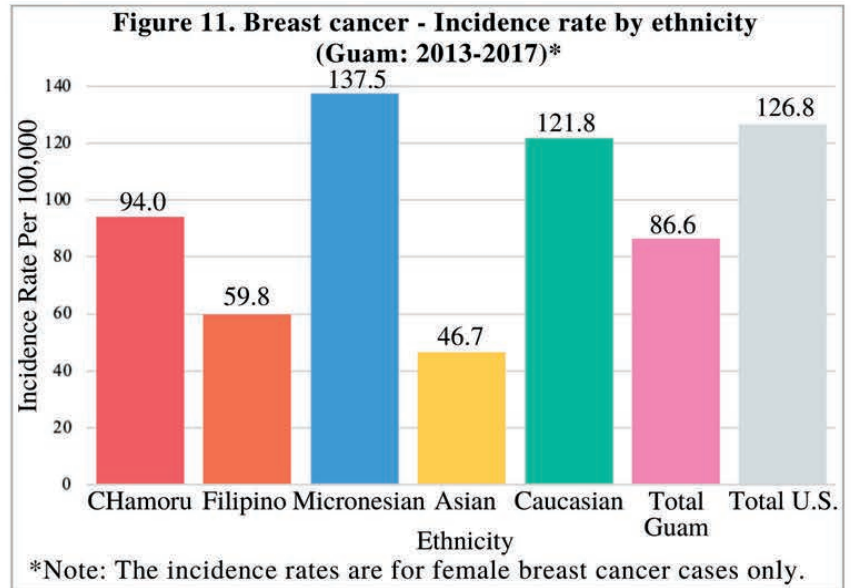


### BREAST CANCER

From 2008 to 2017, breast cancer was the most commonly diagnosed cancer overall and for females in Guam. Between 2013 to 2017, it was the fourth leading cause of cancer-related mortality on the island.

**Current situation:**

- Despite being the most frequently diagnosed cancer in Guam from 2013 to 2017, the island’s average incidence rate (**86.6**) remained lower than the total U.S. average (**126.8**), which is approximately 1.5 times greater than Guam’s average incidence rate (Figure 11).
- From 2013 to 2017, Micronesians were the only ethnic group whose breast cancer incidence rate (**137.5**) was higher than the U.S. total incidence rate (**126.8**).
  - The breast cancer incidence rate for the Micronesian population was about 2.9 times greater than the rate for the Asian population (**46.7**).
- Although not higher than the total U.S. incidence rate, the CHamoru (**94.0**) and Caucasian (**121.9**) populations had incidence rates that were higher than Guam’s total incidence rate (**86.6**).

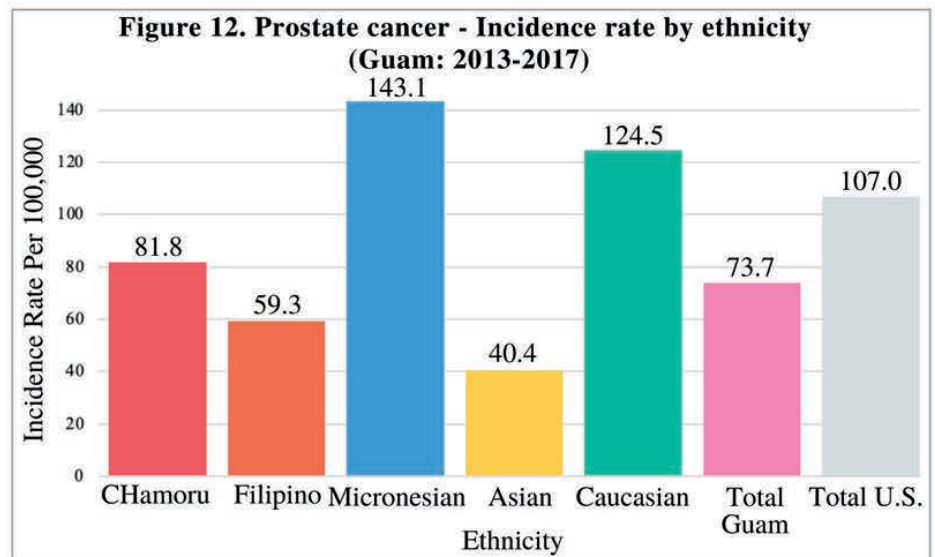


### PROSTATE CANCER

From 2013 to 2017, prostate cancer was the most common cancer diagnosed in males and the third leading cause of cancer-related deaths in males. Despite only being diagnosed in males, it was the fourth most common cancer diagnosed in Guam and fifth leading cause of cancer mortality.

**Current situation:**

- From 2013 to 2017, Guam’s average prostate cancer incidence rate (**73.7**) was lower than the US rate (**107.0**) (Figure 12).
- In this time period, incidence rates for the Micronesian (**143.1**) and Caucasian (**124.5**) populations were higher compared to the average incidence rates for the U.S. (**107.0**) and Guam (**73.7**).
- Among the ethnic groups in Guam, Micronesians (**143.1**) had the highest prostate cancer incidence rate.
  - Compared to the Asian population (**40.4**), which had the lowest prostate cancer incidence rate, the rate for the Micronesian population was about 3.5 times greater.



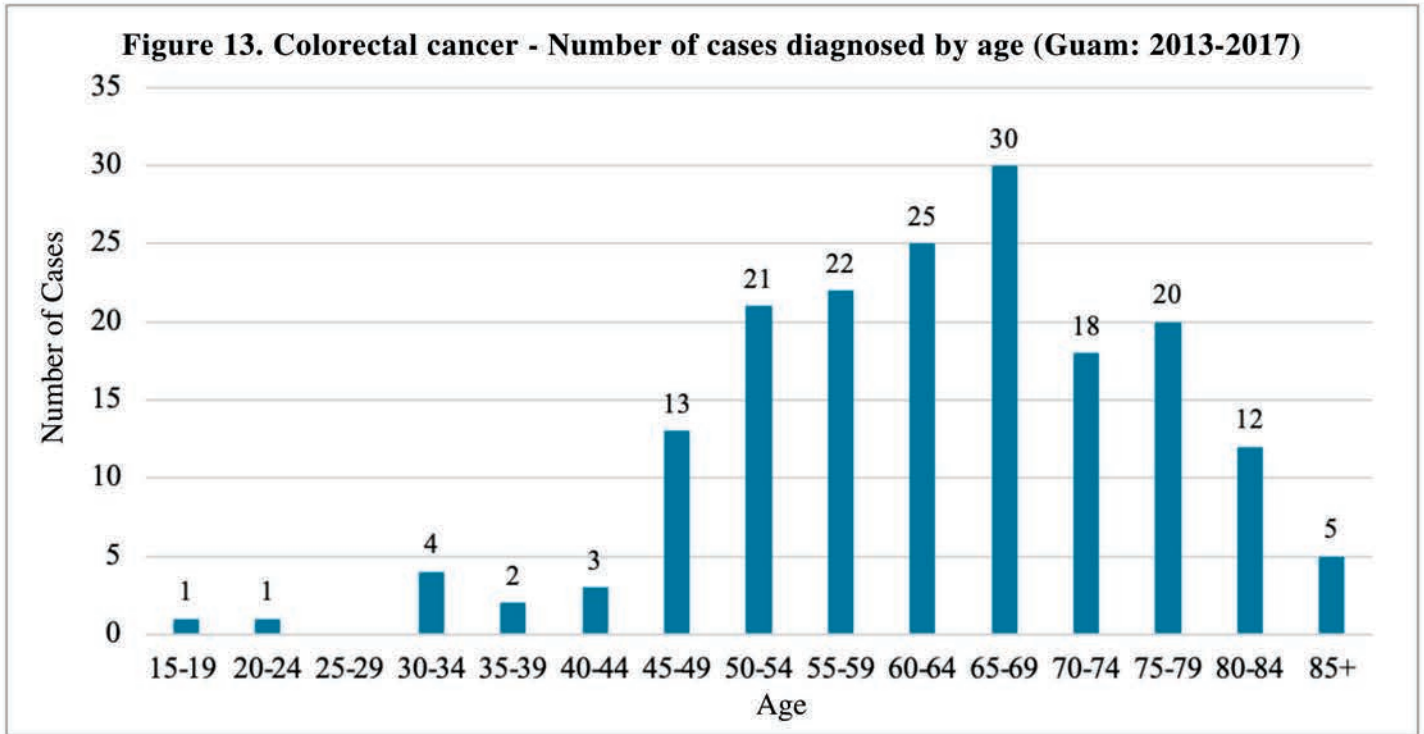
### *Potential Gaps:*

- Based on the 2013 to 2017 data on cancer incidence by ethnicity, it is evident that specific populations experience a higher frequency of cancer diagnosis for certain types of cancer in comparison to other ethnic groups.
  - Micronesians experienced higher incidence rates for lung & bronchus, prostate, liver, and breast cancers compared to the national average and other ethnic groups in Guam.
  - CHamorus had relatively higher incidence rates for lung & bronchus, colorectal, and liver cancer.
  - Caucasians also experienced higher incidence rates of lung & bronchus, prostate, and colorectal cancer than the national average.
  - Besides colorectal cancer, Filipino and Asian populations had the lowest incidence rates for the cancers discussed compared to the other ethnic groups in Guam.
- Interventions, community outreach, and educational efforts should tailor their activities and material to target communities that experience certain types of cancer at a greater frequency compared to other ethnic groups.
  - For example, the Micronesian population had the highest lung cancer incidence rate. Lung & bronchus cancer educational material may be translated into Micronesian languages to reach a larger audience within this community.
- Research may examine the factors contributing to the higher incidence rates for certain cancers in Guam within specific ethnic groups.
  - For example, the liver cancer incidence rate for the Micronesian and CHamoru populations is significantly higher than the U.S. total average incidence rate. One may examine the community's awareness and knowledge about this type of cancer, the availability of screening tests, and the potential lack of services provided to specific ethnic groups.
- Future research can also study the environmental, lifestyle, and genetic factors that may or may not be present in communities more vulnerable to certain types of cancer.



# EARLY-ONSET CANCER

## COLORECTAL CANCER



**Current Situation:**

- In Guam, from 2007 to 2015, of the 303 colorectal cancer cases diagnosed, 52 (17.2%) cases were diagnosed in individuals younger than 50 years of age.
- From 2013-2017, of the 177 colorectal cancer cases diagnosed, 16 (9%) were diagnosed in those between 40 and 90 years old (Figure 13).
- According to the American Cancer Society, nationally, from 1990-2015 there was a 6.0% increase in colorectal cancer cases in individuals under the age of 50.

**Screening Recommendation:**

In 2021, the United States Preventive Services Task Force (USPSTF) updated their colorectal cancer screening recommendations. The screening age was lowered from 50 to 45 years old age for “asymptomatic adults 45 years or older who are at average risk of colorectal cancer.”

**Potential Gaps:**

- Current data may imply that colorectal cancer cases are being diagnosed with greater frequency in individuals younger than 50 years old.
  - Community outreach and education on colorectal cancer should be inclusive of those 40 to 90 years old.
- According to 2018 BRFSS data for Guam, colorectal cancer screening rates were highest in White individuals (61.3%) and lowest in Native Hawaiian or other Pacific Islander populations (35.3%). Higher incidence rates in Caucasian populations may imply that more cancer cases were identified through screening.

# STAGE AT DIAGNOSIS

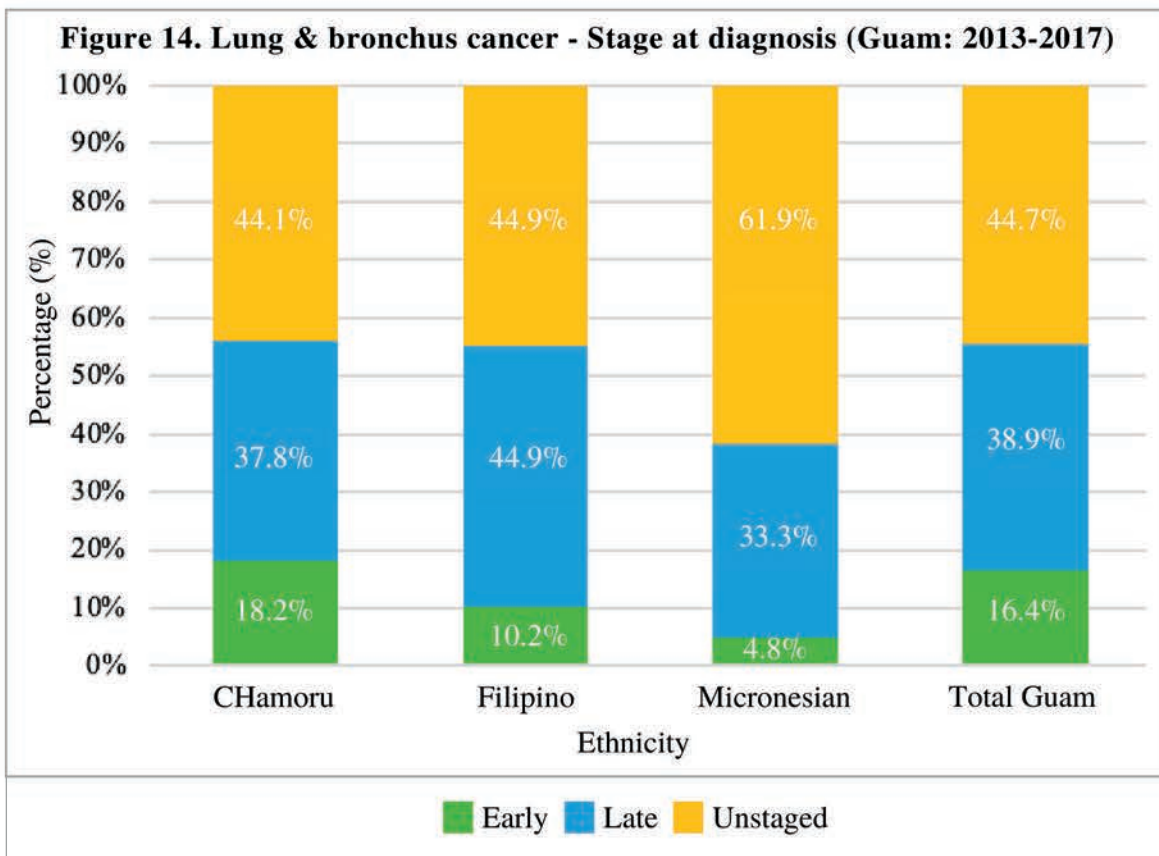
Once cancer has been diagnosed, medical professionals will determine the stage of the cancer. The American Cancer Society defines staging as “the process of finding out how much cancer is in a person’s body and where it’s located.” Staging allows the patient and doctors to know how far the cancer has spread. Knowing the cancer stage at diagnosis will enable doctors to understand the severity of an individual’s cancer and their chances for survival, plan treatment, and identify clinical trials for which they may be eligible (National Cancer Institute).

Data from this section is from the *Guam Cancer Facts & Figures 2013-2017*. Staging is categorized into three groups: early, late, and unstaged.

- **Early Stages** – Cancer that is early in its growth and may not have spread to other parts of the body. What is defined as the early stage may differ between cancer types.
- **Late Stages** – Cancer that is far along in its growth and has spread to the lymph nodes or other places in the body.
- **Unstaged** – is cancer for which there is not enough information to indicate a stage.

This section discusses the stage at diagnosis for six leading cancers in Guam. The staging for these cancers is broken down for three ethnic groups, CHamorus, Filipinos, and Micronesians. The stage at diagnosis for Guam overall has also been provided.

## LUNG & BRONCHUS CANCER



### **Current Situation:**

- Between 2013 to 2017, most lung & bronchus cancer cases diagnosed in Guam were unstaged (44.7%). Of the staged cases, the percentage of late-stage diagnoses (38.9%) was more than double those diagnosed early (16.4%) (Figure 14).
  - Overall, lung & bronchus cancers had the second highest percentage of late-stage diagnoses.
- Filipinos had the highest percentage of late-stage diagnoses for lung & bronchus cancers (44.9%). Yet, they had the lowest incidence rate (29.6%) among ethnic groups in Guam and compared to the average rates for the U.S. and Guam.
  - The data may imply that while the diagnosis of lung & bronchus cancers was less frequent compared to other ethnic groups, almost half (44.9%) of those cases were diagnosed in the late stages. Only 10.2% were found in the early stages.
- More than half (61.9%) of the lung & bronchus cancer cases diagnosed in the Micronesian population remained unstaged. Of the staged cases, Micronesians had the lowest percentage of early-stage diagnosis (4.8%). Cases diagnosed in the late stage were almost 7 times greater (33.3%) than those diagnosed in late stages.
  - Notably, the Micronesian population had the highest lung & bronchus cancer incidence rate (78.6) among ethnic groups in Guam and, compared to the average rates for the US and Guam. Relative to other ethnic groups, a high number of lung & bronchus cancer cases was diagnosed in the late stages.
- The CHamoru population had the highest percentage of early-stage diagnoses (18.2%). However, there was a greater prevalence of late (37.8%) or unstaged (44.1%).

### **Screening Recommendation:**

The U.S. Preventive Task Force Services recommend annual screening using low-dose computed tomography (LDCT) for adults between the ages of 50 to 80 years old with a 20 pack-year smoking history who are either current smokers or quit within the past 15 years.

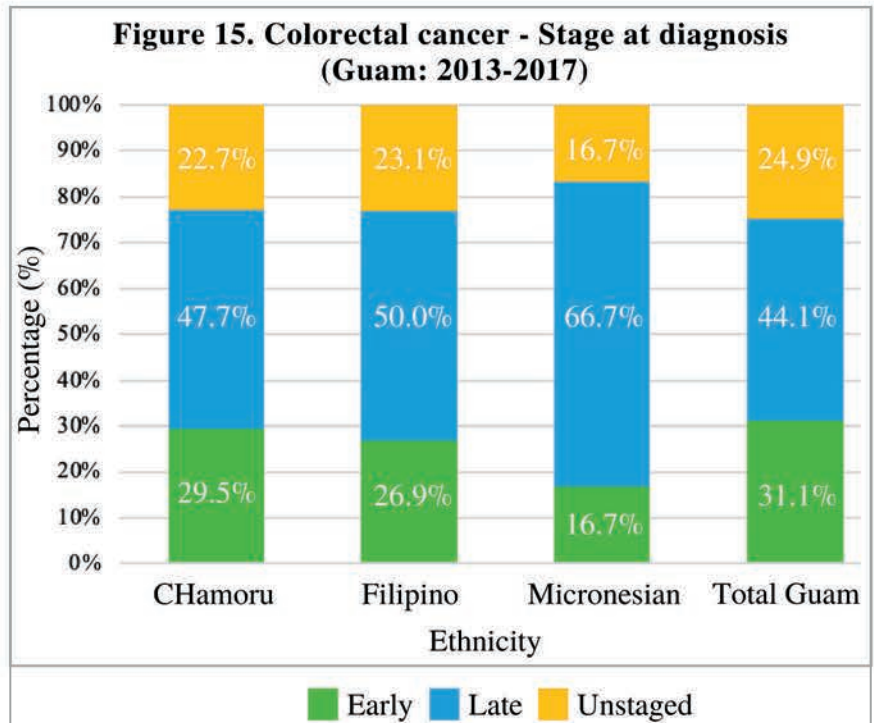
### **Potential Gaps:**

- From 2013 to 2017, most lung & bronchus cancers remained unstaged. A lack of staging was highest among the Micronesian population.
  - Future research may examine the factors that lead to cases not being staged, such as a lack of information being collected.
- In all ethnic groups and Guam, less than **20%** of lung & bronchus cancers were found in the early stages, and more than **30%** were diagnosed in the late stages. Late and unstaged cases have lower chances of survival compared to early-stage cases.
  - There may be fewer treatment options available with a late-stage diagnosis. This data may imply a lack of lung & bronchus cancer screening. Therefore, screening using LDCT should be promoted to Guam's community, especially those between 50 to 80 years old with a smoking history.
  - Efforts must also be made to educate the community on this cancer and its signs & symptoms. Education should primarily be focused on those in the Micronesian and Filipino communities because data indicates that these ethnic communities have been disparately impacted by lung & bronchus cancers.
- Lung & bronchus cancers were the leading cause of cancer-related deaths in Guam. Late-stage diagnosis may be a factor that contributes to mortality. According to the National Cancer Institute's (NCI) Surveillance, Epidemiology, and End Results (SEER) Program, at the national level, the 5-year survival rate for lung & bronchus cancer declines with the stage at diagnosis. The 5-year survival rate for cases diagnosed at the localized stage is **61.2%**. In comparison, those diagnosed at the regional stage are **33.3%** and at the distant stage is **7.0%**. Cancers diagnosed in later stages may have a decreased likelihood of surviving five or more years. The 5-year survival rate for lung & bronchus cancer cases whose staging remains unknown (**9.9%**) is also low.
- Screening rates for Guam are not available at this time.

### COLORECTAL CANCER

#### Current Situation:

- Between 2013 to 2017, late-stage diagnoses (44.1%) of colorectal cancer (CRC) cases in Guam were more frequent than early-stage diagnoses (31.1%) and unstaged cases (24.9%) (Figure 15).
  - Among leading cancers in Guam, colorectal cancer had the highest percentage of late-stage diagnosis.
- More than half the colorectal cancer cases diagnosed in Micronesians (66.7%), half the cases in Filipinos (50.0%), and nearly half of those in CHamorus (47.7%) were identified in the late stages.



- Despite Micronesians having the lowest incidence rate (8.7) among ethnic groups in Guam, they had the highest percentage of late-stage diagnoses (66.7%). Therefore, although there were fewer cases diagnosed in the Micronesian population, the majority of those cases were found in the late stages.
- CHamorus had the second highest CRC incidence rate (41.0) among ethnic groups in Guam. Almost half (47.7%) of those cases were identified in their late stages.
- Over a quarter of cases diagnosed in CHamoru (29.5%) and Filipino (26.9%) populations, as well as Guam’s overall population (31.1%), were diagnosed early. The Micronesian population had the lowest percentage of early-stage diagnoses (16.7%).
  - In the Micronesian population, the late-stage diagnosis was nearly 4 times greater than the early-stage diagnosis.

#### Screening Recommendation:

The U.S. Preventive Task Force Services recommend colorectal cancer screening for adults between the ages of 45 to 75 years old. There are multiple screening methods available on Guam, such as blood stool test (FIT), sigmoidoscopy, and colonoscopy.

#### Potential Gaps:

- The high percentage of late-stage diagnoses implies that colorectal cancer is not being found in the early stages when more treatment options are available. According to the NCI SEER, at the national level, 5-year survival declines with the diagnosis stage. The 5-year relative survival declines for colorectal cancer cases diagnosed at the localized (90.9%), regional (72.8%), and distant (15.1%) stages. CRC is the third leading cause of cancer-related death in Guam, accounting for 9.5% of all cancer-related deaths. Late-stage diagnosis may play a role. The national data indicate that the likelihood of surviving five or more years significantly declines when CRC is diagnosed in later stages.
- About 1 in 5 colorectal cancer cases, 24.9% overall, are unstaged. Research should examine the factors that lead to cases remaining unstaged.
- Several factors may contribute to the late-stage diagnosis of colorectal cancer in Guam, including a low level of CRC screening. According to the Centers for Disease Control and Prevention (CDC)’s Behavioral Risk Factor Surveillance System (BRFSS), 2020 data, 55.2% of Guam residents between 50 to 75 years old who were surveyed received one or more of the recommended CRC tests within the recommended time interval.

### COLORECTAL CANCER CONTINUED

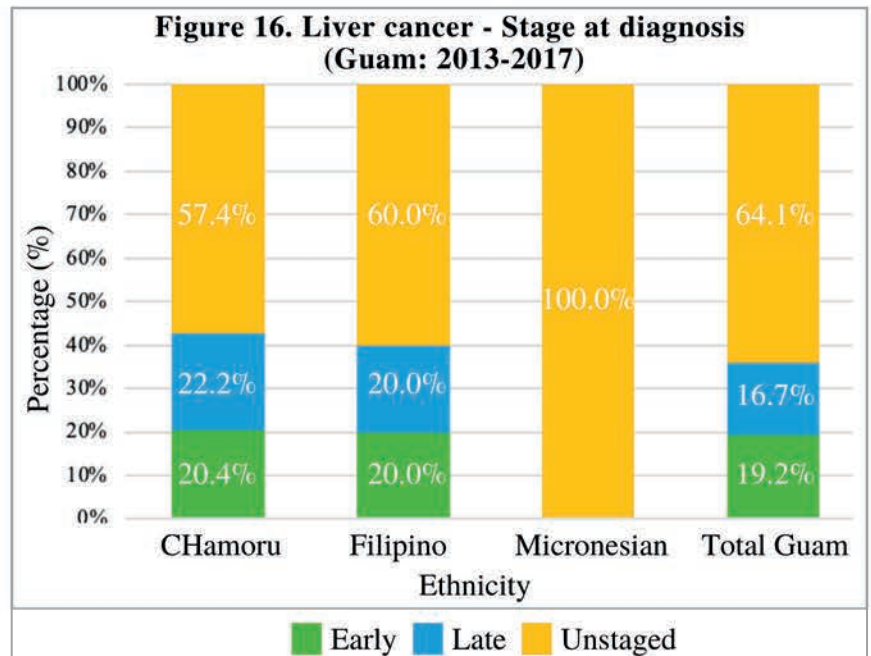
**Potential Gaps:**

- On the other hand, **39.6%** of Guam residents surveyed had never received any of the recommended CRC tests, and **5.2%** did not receive one or more of the recommended CRC tests within the recommended time interval. This data indicates a low level of CRC screening in the age-eligible population.
  - Therefore, outreach and education on colorectal cancer and available screening methods should be promoted to all adults in Guam who are 45 years and older.
  - The Micronesian, CHamoru, and Filipino communities all experience high rates of late-stage diagnosis. Community outreach and education should be focused on these communities to promote screening and educate individuals about this cancer.
  - Since various colorectal cancer screening methods are available in Guam, studies to identify the barriers to screening in the eligible population should be conducted.

### LIVER CANCER

**Current Situation:**

- Between 2013 to 2017, over half of the liver cancer cases diagnosed in Guam were unstaged (**64.1%**). The percentage of unstaged cases is 3 times greater than those diagnosed in the early stages (**19.2%**) and almost four times greater than those diagnosed in the late stages (**16.7%**) (Figure 16).
  - Among the leading cancers in Guam, a lack of staging was most frequent in liver cancer cases.
- Early and late-stage diagnoses were slightly higher for the CHamoru and Filipino ethnic groups.
  - Among ethnic groups in Guam, CHamorus had the second highest liver cancer incidence rate (22.0).



Of the cases diagnosed, 20.4% were found in the early stages, 22.2% were diagnosed in the late stages, but most remained unstaged (57.4%).

- In the Filipino population, 1 in 5 liver cancer cases was found in either the early (**20.0%**) or late (**20.0%**) stage. Relative to other ethnic groups in Guam, Filipinos had the lowest liver cancer incidence rate (**2.2**). Of the cases diagnosed, more than half remained unstaged (**60.0%**).
- All liver cancer cases diagnosed in the Micronesian population in this period were unstaged (**100.0%**).
  - Among ethnic groups in Guam, Micronesians had the highest liver cancer incidence rate (**36.2**). The Micronesian community experienced a higher frequency of liver cancer diagnoses, and all reported cases remained unstaged.

**Screening Recommendation:**

Currently, there is no standard or routine screening for liver cancer. However, some experts recommend screening using alpha-fetoprotein (AFP) blood tests and an ultrasound exam every 6 months for individuals who are at higher risk for liver cancer. People may be at higher risk if they have cirrhosis, hereditary hemochromatosis, or chronic hepatitis B infection.

### LIVER CANCER CONTINUED

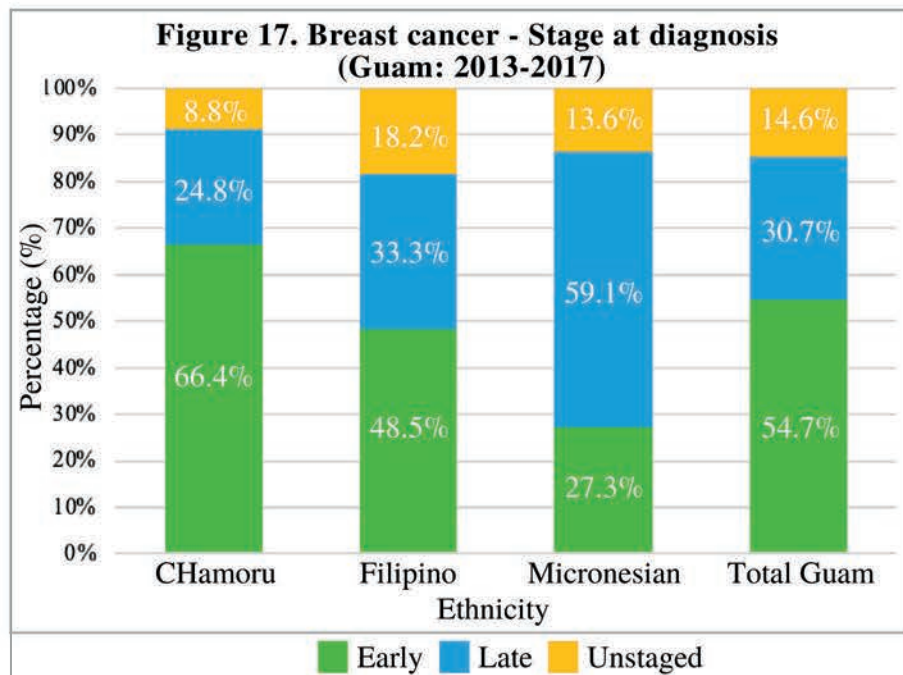
#### Potential Gaps:

- According to the NCI SEER, at the national level, the 5-year survival rate declines with the stage at diagnosis. The survival rate at the localized stage is **36.1%**, and this declines at the regional stage (**12.8%**) and the distant stage (**3.1%**). The 5-year survival rate for liver cancer cases whose stage is unknown was **8.2%**. Between 2013 and 2017, liver cancer was the second leading cause of cancer-related deaths in Guam. Most cases were identified in the late stages or remained unstaged. The likelihood of surviving five or more years is lower for these cases than if the cancer was found in earlier stages.
  - Based on the data, there appears to be a lack of information on the staging liver cancer cases. The capacity of Guam to collect information on liver cancer cases for staging must be examined.
  - The lack of staging was most prevalent for Micronesians. Research can investigate the factors that hinder staging for this population.
- About 1 in 5 liver cancer cases in Guam were found in the late stages. No standard or routine screening test is available, so there may be fewer chances for early detection compared to cancers with routine screening tests.
  - There are specific tests recommended for individuals who may be at high risk for liver cancer. Outreach initiatives can focus on educating the community on the conditions that may lead to higher risks for liver cancer. These efforts can also target vulnerable populations, such as the Micronesian community, which had the highest liver cancer incidence rate.

### BREAST CANCER

#### Current Situation:

- From 2013 to 2017 in Guam, **54.7%** of the breast cancer cases diagnosed in females were found in the early stages. The percentage of late-stage diagnoses for this cancer (**30.7%**) doubles the unstaged cases (**14.6%**) (Figure 17).
  - Compared to other leading cancers in Guam, breast cancer had the second highest rate of early-stage diagnosis.
- The frequency of early-stage diagnosis significantly varied among the three ethnic groups.
  - From 2013 to 2017, CHamorus had the third lowest breast cancer incidence rate (**94.0**). Of the breast cancer cases diagnosed in CHamoru females, over half (**66.4%**) were



found in the early stages while almost a quarter (**24.8%**) were found in the late stages and about **8.8%** were unstaged. Compared to Filipinos and Micronesians, CHamorus had the highest percentage of early stage breast cancer diagnosis.

- Almost half of the breast cancer cases diagnosed in Filipinos (**48.5%**) were found in the early stages. Filipinos had the second lowest breast cancer incidence rate (**59.8**) among ethnic groups in Guam. Compared to other ethnic groups, fewer breast cancer cases were diagnosed in the Filipino population, and of those cases, nearly half were identified in the early stages.



### BREAST CANCER CONTINUED

- Compared to other ethnic groups and Guam's average, the Micronesian population has the lowest percentage of early-stage diagnoses (27.3%) and the highest percentage of late-stage diagnoses (59.1%). From 2013 to 2017, the Micronesian population also had the highest breast cancer incidence rate (137.5). Therefore, Micronesian women in Guam experienced comparably higher rates of breast cancer diagnosis, and over half of the cases diagnosed were identified in the late stages.
- Over 30% of cases diagnosed in Filipinos (33.3%), Micronesians (59.1%), and Guam's overall population (30.7%) were in the late stage. The lowest percentage of late-stage diagnoses occurred in the CHamoru population (24.8%).

#### Screening Recommendation:

The U.S. Preventive Services Task Force recommends that women between 50 to 74 years of age who are at average risk receive mammography biennially.

#### Potential Gaps:

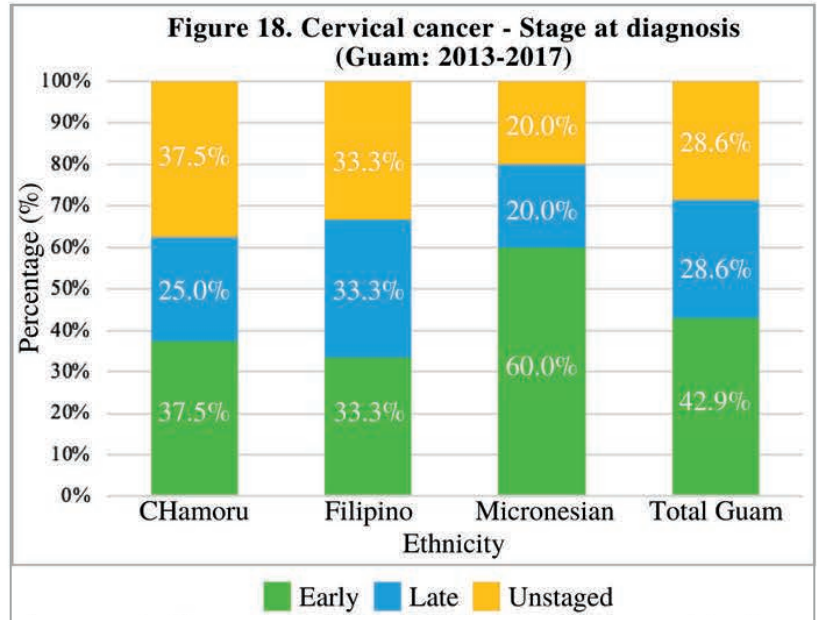
- From 2013 to 2017, more than half of the breast cancer cases diagnosed in females were in the early stages. An advantage of early-stage diagnosis is that more treatment options may be available for cancer patients. However, among the CHamoru, Filipino, and Micronesian ethnic groups, the percentage of early-stage diagnoses varied.
  - Micronesians may be a vulnerable population as they had the highest percentage of late-stage diagnosis (59.1%) and the highest incidence rate among ethnic groups in Guam. Breast cancer education and community outreach should engage this population. For example, due to the high percentage of late-stage diagnoses, breast cancer screening using mammography should be promoted to older Micronesian females (50 to 74 years old).
  - More than a quarter of breast cancer cases diagnosed in Filipinos (33.3%) were in the late stages.
  - Research may examine what factors lead to the lower frequency of early-stage diagnosis for the Filipino and Micronesian communities.
- According to the NCI SEER, at the national level, the 5-year survival for breast cancer declines with the stage at diagnosis from 99.1% for localized cases to 86.1% for cases at the regional stage to 30.0% for cases at the distant stage. The 5-year survival rate for unstaged cases was 60.0%. Although breast cancer was the most frequently diagnosed cancer in Guam from 2013 to 2017, it was the sixth leading cause of cancer-related deaths. Early identification and diagnosis of this cancer may be a factor in the relatively lower mortality rates. A high percentage of early-stage diagnoses may indicate that age-eligible females are aware of the screening recommendation and getting screened.
  - Notably, the percentage of early-stage diagnosis varies among the CHamoru, Filipino, and Micronesian populations. The Micronesian community had the lowest percentage of early-stage diagnoses and the highest percentage of late-stage diagnoses. Consequently, Micronesians also had the highest breast cancer mortality rate (104.6) among ethnic groups in Guam. A lack of screening may play a role in the higher percentages of late-stage diagnoses. Again, efforts should be made to educate women in the Micronesian community about breast cancer and the screening recommendations to increase the early detection of this type of cancer.



### CERVICAL CANCER

**Current Situation:**

- From 2013 to 2017 in Guam, **42.9%** of cervical cancer cases were diagnosed in the early stages, which was 1.5 times greater than late-stage (**28.6%**) and unstaged (**28.6%**) cases (Figure 18).
- The Micronesian population had the highest percentage of early-stage diagnoses of cervical cancer (**60.0%**). They also had the highest cervical cancer incidence rate (**31.1**). It can be inferred that cervical cancer was diagnosed at a greater frequency in the Micronesian population, and of the cases diagnosed, over half were found in the early stages.
  - Notably, one in five cases were still found in the late stages (**20.0%**) or were unstaged (**20.0%**)



- CHamorus had the second highest cervical cancer incidence rate (**11.9**). Of the cases diagnosed in the CHamoru population between 2013 to 2017, most cases were found in either the early stages (**37.5%**) or went unstaged (**37.5%**).
- Filipinos had the highest percentage of late-stage diagnoses (**33.3%**). From 2013 to 2017, the female Filipino population in Guam had the lowest cervical cancer incidence rate (**5.8**) among ethnic groups compared to the average incidence rates for the United States and Guam. It can be inferred that in the Filipino population, there were fewer cases diagnosed relative to other ethnic groups. However, of the cases diagnosed, over a quarter of cases were identified in the late stages.
- About 3 out of every 10 cervical cancer cases diagnosed in Guam (**28.6%**) remained unstaged. CHamorus (**37.5%**) and Filipinos (**33.3%**) had relatively high rates of late-stage diagnosis.

**Screening Recommendation:**

The U.S. Preventive Services Task Force (USPSTF) recommends cervical cancer screening using cervical cytology every three years, starting from 21 to 29 years old. For women 30 to 65 years old, the USPSTF recommends screening using cervical cytology every three years, or every five years with a high-risk human papillomavirus (hrHPV) test, or every five years with the hrHPV test and cervical cytology.

**Table 4. Cervical cancer screening in Guam's Community Health Centers (2016-2020)**

Year	2016	2017	2018	2019	2020
Number of females screened	2,467	1,902	1,160	1,240	1,457
Percentage of eligible population screened	71.43%	61.43%	40.0%	47.14%	65.71%

Source: Guam Community Health Centers, Quality of Core Measures

### CERVICAL CANCER CONTINUED

#### Potential Gaps:

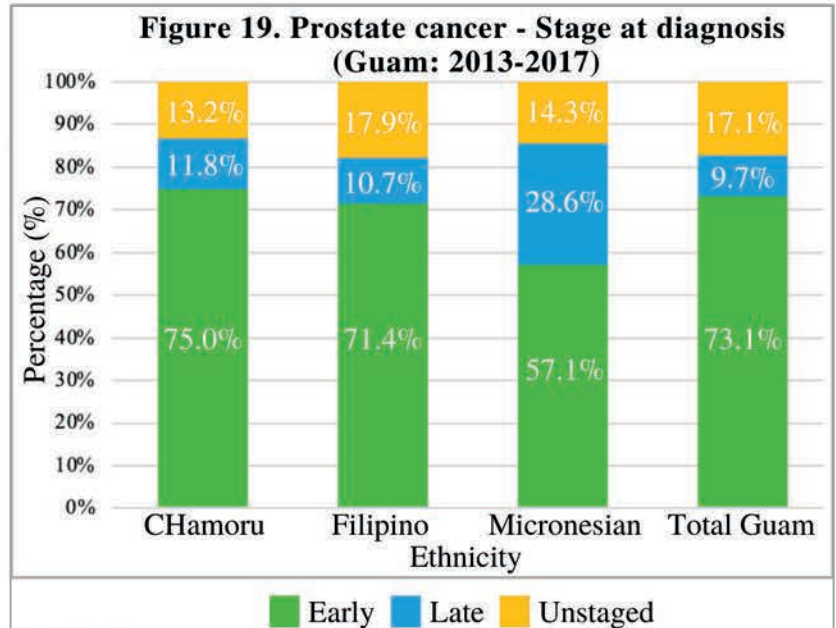
- The data indicates that the majority of cervical cancer cases diagnosed between 2013 to 2017 in Guam were found in the early stages. In part, this may be attributed to screening. According to the CDC's BRFSS 2020 survey, of the female respondents in Guam between the ages of 21 to 65 years old, **68.0%** were screened using a Pap test within the past 3 years, while **32.0%** were not. Additionally, Table 4 provides cervical cancer screening data from Guam's Community Health Centers (CHCs). In 2016 and 2017, over half of the CHCs' age-eligible patients received screening. However, this rate significantly declined in 2018. From the BRFSS and CHCs data, one can also infer that over a quarter of age-eligible females in Guam may not have received cervical cancer screening in the recommended intervals.
  - Since there is still a sizable portion of the age-eligible population that has not been screened for cervical cancer, community outreach should continue to promote screening and preventative behavior, such as receiving the human papillomavirus (HPV) vaccination.
- Despite having the highest percentage of cases diagnosed early, the Micronesian population also had the highest incidence rate. Additionally, 40% of cases diagnosed were still found late or remained unstaged. Therefore, this ethnic group should remain a target population for outreach, education, and services.
  - Research should also examine the factors that lead to the greater frequency of diagnosis in this ethnic group.
- Although there may be fewer cervical cancer cases diagnosed within the Filipino community, they may be vulnerable given the relatively higher percentage of cases found in the late stages (**33.3%**) and a lower percentage of cases found in the early stages (**33.3%**).
- According to the NCI SEER, at the national level, the 5-year survival rate for cervical cancer declines for cases diagnosed at the localized (**91.8%**) to regional (**59.4%**) and distant (**17.1%**) stages. The 5-year survival for cervical cancer cases whose stage was unknown was **53.6%**. Between 2013 to 2017 in Guam, cervical cancer was the third most common cause of cancer-related death (**7.0%**) for women. Over one-quarter of cervical cancer cases were diagnosed in the late stage or were unstaged. In these stages, the likelihood of surviving 5 or more years is relatively lower compared to cases detected in earlier stages. This may contribute to cervical cancer's high ranking among the types of cancer-related deaths for females in Guam.
  - Notably, the Micronesian community had a higher mortality rate (**22.3**) in comparison to CHamorus (**6.4**) and the averages for the U.S. (**2.3**) and Guam (**6.7**). Despite having the highest percentage of cases diagnosed in its early stages, Micronesians still face disproportionately higher mortality rates. Research may examine what factors lead to the greater frequency of cervical cancer-related deaths among Micronesian females despite early identification of cancer.



### PROSTATE CANCER

#### Current situation:

- Between 2013 to 2017 in Guam, **73.1%** of prostate cancer cases were diagnosed in the early stages. Less than **20%** of cases remained unstaged (**17.1%**) or were found in the late stages (**9.7%**) (Figure 19).
- Compared to CHamorus and Filipinos, Micronesians experienced the highest percentage of late-stage diagnoses (**28.6%**) and the lowest percentage of early-stage diagnoses (**57.1%**).
  - The prostate cancer incidence rate for Micronesians (**143.1**) is approximately 1.7 times greater than the rate for CHamorus (**81.8**) and 2.4 times the rate for Filipinos (**59.3**). Prostate cancer diagnoses may be more prevalent in the Micronesian community. Of the cases diagnosed, about a quarter are detected in the late stages.
  - About 3 out of every 10 prostate cancer cases in Micronesian males were found in the late stages. The percentage of prostate cancer cases diagnosed in the late stages for Micronesians was more than double the percentage for CHamorus (**2.4 times higher**), Filipinos (**2.7 times higher**), and Guam's overall population (**2.9 times higher**).
- CHamorus had the highest percentage of early-stage diagnoses of prostate cancer (**75.0%**) and the lowest percentage of unstaged cases (**13.2%**).
- Compared to the CHamoru and Micronesian communities, as well as Guam's average, Filipinos had the highest percentage of unstaged cases (**17.9%**).



#### Screening Recommendation:

The U.S. Preventive Services Task Force recommends that men between the ages of 55 to 69 years old should make the individual decision to undergo periodic prostate-specific antigen (PSA)-based screening. Individuals should discuss the potential benefits and harms with their clinician(s). The USPSTF explains that PSA screening for prostate cancer offers a small potential benefit of reducing the chance of death from prostate cancer.

#### Potential gaps:

- A high percentage of early-stage diagnoses is beneficial, as more treatment options may be available.
- According to the NCI SEER, at the national level, 5-year survival for prostate cancer is **100.0%** for localized and regional **100.0%** cases. However, the percentage of 5-year survival declines for cases diagnosed at the distant stage (**32.3%**) and cases whose stage is unknown (**85.8%**). From 2013 to 2017 in Guam, **9.7%** of prostate cancer cases were diagnosed in the late stages, and **17.1%** were unstaged. It was also ranked as the third leading cause of cancer-related death (**10.8%**) among males.
  - A majority of prostate cancers were diagnosed in the early stages when the 5-year survival rate is high. However, it was the third leading cause of death in males in Guam from 2013-2017. Research should be conducted on factors that contribute to prostate cancer mortality.
- Micronesians are a more vulnerable population as they have a relatively higher percentage of late-stage diagnosis and incidence rate when matched against CHamorus and Filipinos.
- Although screening is not recommended for all males in the eligible age group, adult males in Guam should be educated on prostate cancer and encouraged to speak to their health providers about the benefits of screening.
- More than **10%** of all prostate cancer cases remained unstaged. Similar to other cancers, research can examine the barriers to staging.

# LIFESTYLE RISK FACTORS

Risk factors may increase one’s chance of developing a disease like cancer. While certain risk factors, such as age and family history, cannot be controlled, others can. Lifestyle risk factors are determinants that individuals have control over and can be changed to decrease the likelihood of developing certain cancers.

This section will review thirteen lifestyle risk factors utilizing Guam data from the Centers for Disease Control & Prevention’s Behavior Risk Factor Surveillance System (BRFSS)’s 2022 survey for adults and the 2019 Youth Risk Behavior Survey (YRBS) for Guam high school students.

When using BRFSS data, one should note that Chamoru, Filipino, and Micronesian ethnic groups do not have specific categories. Instead, these ethnic groups may be categorized under Native Hawai’ian/other Pacific Islander, Asian, or multiracial. BRFSS data is organized by gender, age, ethnicity, educational attainment, and household income. YRBS data is organized by gender, race, and grade level.

BRFSS data uses crude prevalence. The CDC defines prevalence as “the measured or estimated percentage of people with an attribute or disease during a specific period of time.”

The risk factors that will be covered include:

- Tobacco use (adult)
- Smokeless tobacco (adult)
- Tobacco use (youth)
- Electronic Vapor Product (youth)
- Alcohol consumption (adult)
- Heavy drinking (adult)
- Alcohol consumption (youth)
- Binge drinking (youth)
- Health coverage (adult)
- Overweight and obese (adult)
- Overweight and obese (youth)
- Physical activity (adult)
- Physical activity (youth)

## TOBACCO USE (ADULT)

Tobacco is a leading risk factor for several types of cancer and contributes to cancer-related death. It is linked to cancers of the:

- Bladder
- Blood (acute myeloid leukemia)
- Cervix
- Colon and rectum
- Esophagus
- Kidney and renal pelvis
- Liver
- Lung, bronchi, and trachea
- Mouth and throat
- Pancreas
- Stomach
- Voice box (larynx)

There are over 70 chemicals found in the smoke from cigarettes, cigars, and pipes that may cause cancer.

The 2020 BRFSS survey found that out of **2,107** adults in Guam surveyed, **20.0% (356)** were current smokers, while **80.0% (1,751)** were not current smokers.

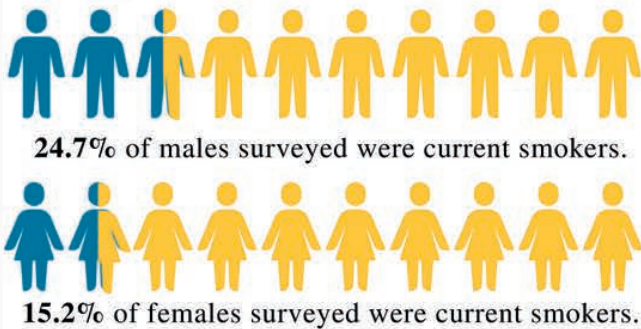


### TOBACCO USE (ADULT) CONTINUED

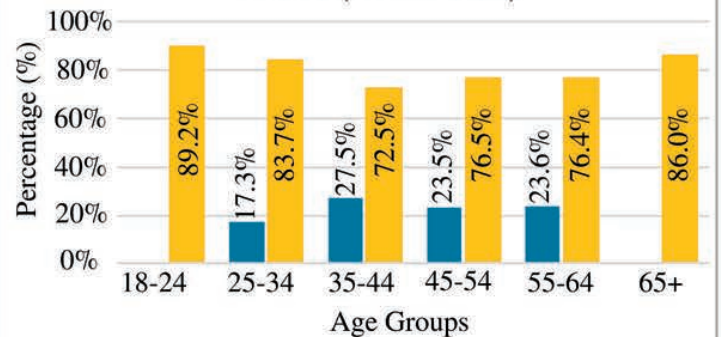
**Current Situation:**

- Based on the data, about 1 in 5 adults in Guam were current smokers.
- **Gender:** The percentage of male respondents (**24.7%**) reported to be current smokers was 1.6 times greater than female respondents (**15.2%**) that reported being current smokers (Figure 20).
- **Age:** Data on current smokers is not available for all age groups. For the age groups with data, the 35 to 44 age group had the highest percentage of respondents to report being current smokers (**27.5%**). Notably, there was a **10.2%** increase in current smokers when shifting from 25 to 34 years old (**17.3%**) to those 35 to 44 years old (**27.5%**) (Figure 21).
- **Ethnicity:** Survey respondents identifying as multiracial had the highest percentage of current smokers (**27.7%**). This was followed by NHOPI (**24.2%**). The lowest rate was seen in White (**11.0%**) respondents (Figure 22).
- **Education:** As educational attainment increased, the percentage of current smokers decreased. Individuals with college degrees had the lowest rate (**11.9%**) of respondents that identified as current smokers. In contrast, respondents with less than a high school education had the highest percentage (**34.0%**) of current smokers. The rate of current smokers with less than a high school education as about 2.9 times higher than those who graduated college (Figure 23).
- **Income:** Respondents who reported being in the lowest household income bracket (less than \$15,000) had the highest percentage (**31.5%**) of current smokers. The rate is about 2.3 times higher than the percentage (**14.%**) of those with household incomes ranging from \$35,000 - \$49,999. Individuals in this income bracket had the least number of respondents to report being current smokers (Figure 24).

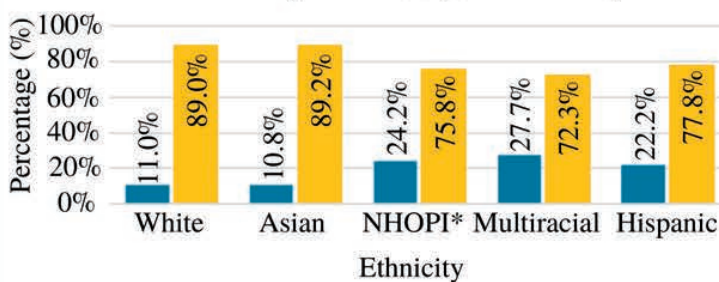
**Figure 20. Percentage of current smokers by gender - BRFSS (Guam: 2020)**



**Figure 21. Percentage of current smokers by age - BRFSS (Guam: 2020)**

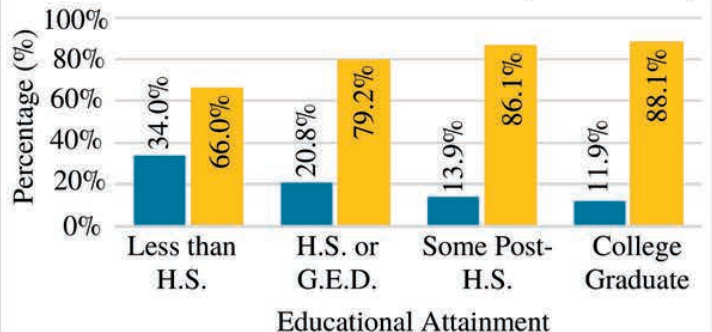


**Figure 22. Percentage of current smokers by ethnicity - BRFSS (Guam: 2020)**



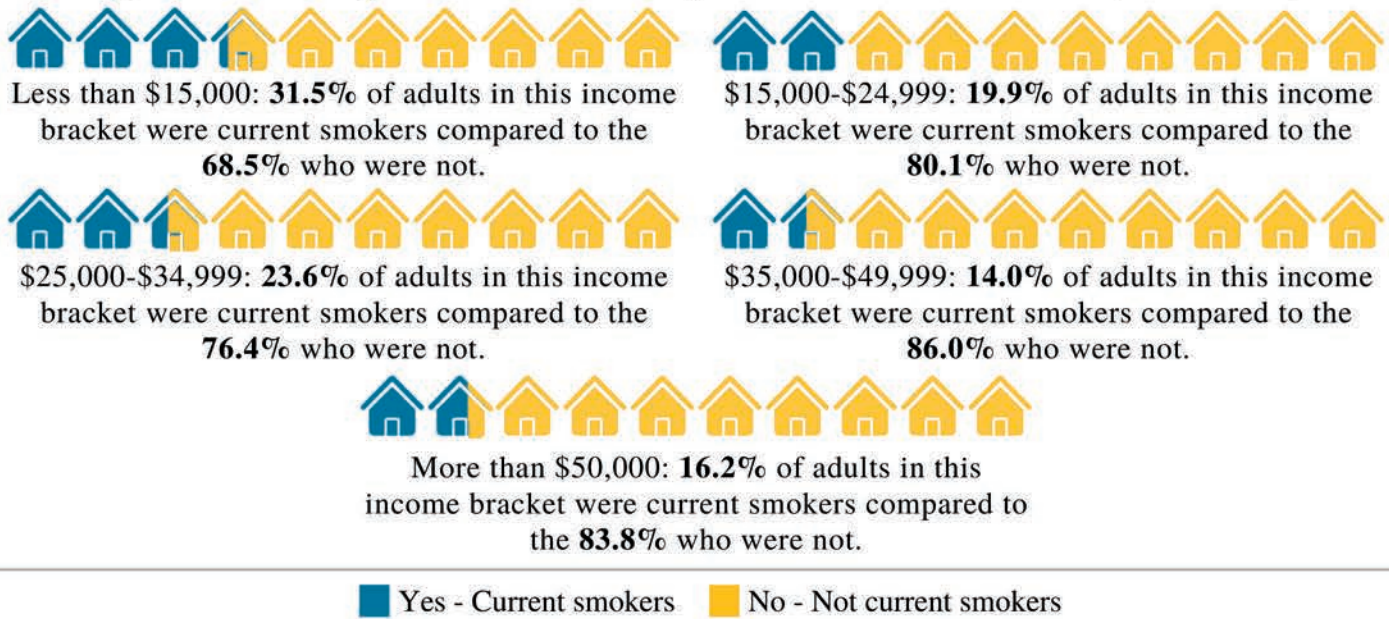
\*NHOPI - Native Hawai'ian or other Pacific Islander

**Figure 23. Percentage of current smokers by educational attainment - BRFSS (Guam: 2020)**



■ Yes - Current smokers    ■ No - Not current smokers

**Figure 24. Percentage of current smokers by household income - BRFSS (Guam: 2020)**



**Potential gaps:**

- Smoking is the leading risk factor for lung cancer and is linked to several other cancers. High percentages of smoking in specific demographics may indicate vulnerable populations in Guam.
- In Guam, the incidence and mortality rates for certain types of cancer were higher for populations that had relatively higher percentages of current smokers.
  - The groups that had the highest percentage of respondents to report being current smokers were males, those between the ages of 35 to 44 years old, individuals who identified as multiracial, followed by NHOPI, and those with a household income of less than \$15,000.
- NHOPI had the second highest percentage of current smokers. Table 5 highlights the incidence rates for certain cancers that link smoking as a risk factor. From this table, one can see that the CHamoru and Micronesian ethnic groups had higher incidence rates when compared to other ethnic groups and the averages for the United States and Guam. High percentages of current smokers in the CHamoru and Micronesian communities may contribute to the higher incidence rates for cancers that link smoking as a risk factor.
  - Research may seek to learn why smoking is more prevalent in these ethnic groups and what can be done to decrease the rates.
- Individuals with the lowest level of education and those in the lowest income bracket also had the highest percentages of current smokers when compared to other groups. Therefore, they may be more vulnerable to incidence and mortality for certain cancers.

**Table 5. Comparison of cancer incidence rate for tobacco-associated cancers by ethnic group (Guam: 2013-2017)**

	CHamoru	Micronesian	Filipino	Asian	Caucasian	Total Guam	Total U.S.
Lung & Bronchus	69.4	78.6	29.6	38.3	63.1	50.9	52.6
Colorectal	41.0	8.7	25.8	11.4	47.5	32.3	40.3
Pancreas	10.6	14.2	3.4	-	-	7.2	12.8
Cervical	11.9	31.2	5.8	-	-	9.8	7.4

Incidence rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.

Note: Rates highlighted in blue indicate ethnic groups whose incidence rates are above the average Guam rate.

### SMOKELESS TOBACCO (ADULT)

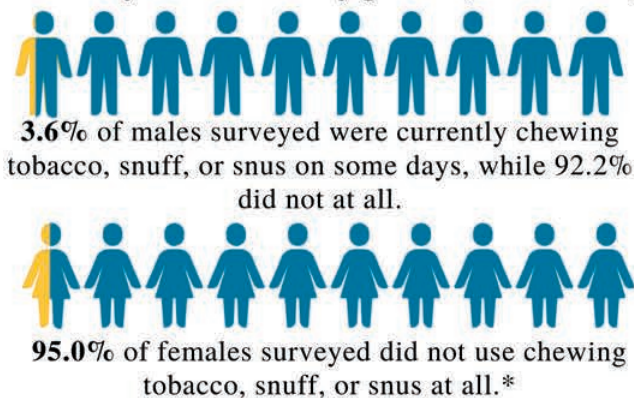
According to Johns Hopkins Medicine, smokeless tobacco products, including chewing tobacco, snuff, and snus, have been found to contain more than 28 cancer-causing chemicals. These products can contribute to cancers in the cheek, gums, and lips. Between 2013 to 2017 in Guam, cancers of the mouth and pharynx ranked as the 7th most common cancer diagnosed and comprised 3.2% of all cancers diagnosed in Guam during this period.

The 2020 BRFSS found that out of 2,072 adults in Guam surveyed, **3.4% (48)** currently use chewing tobacco, snuff, or snus on some days, while **93.6% (2,024)** do not.

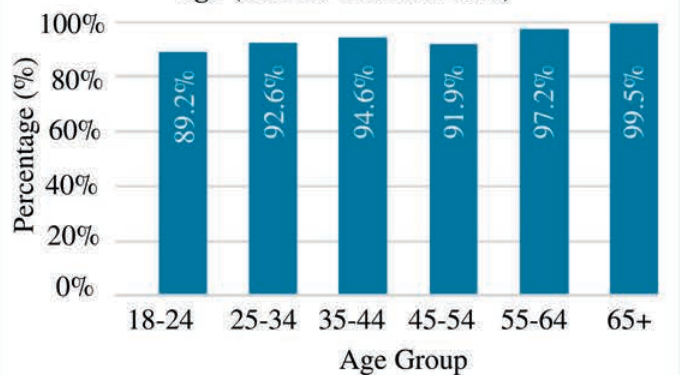
#### Current Situation:

- Most (**93.6%**) adult respondents in Guam do not currently use chewing tobacco, snuff, or snus. However, a small portion of the population used these products on some days (**3.4%**).
- *Gender:* Data on gender for the current use of chewing tobacco, snuff, or snus on some days was only available for males. Of the male respondents surveyed, **3.6%** used these smokeless tobacco products on some days (Figure 25).
- *Age:* Among the age groups surveyed, individuals 65 years or older had the highest percentage (**99.5%**) of respondents who did not currently use chewing tobacco, snuff, or snus. In contrast, those 18 to 24 had the lowest percentage of individuals to report that they did not currently use these products (**89.2%**). This may imply greater use of smokeless tobacco products in the younger age group relative to other age groups (Figure 25).
- *Ethnicity:* The Asian ethnic group had the highest percentage of respondents who did not currently use chewing tobacco, snuff, or snus (**98.9%**). The lowest percentage was seen in respondents who identified as NHOPI (**87.1%**). Again, this may imply that relative to other ethnic groups in Guam, NHOPI used smokeless tobacco products more than others (Figure 27).
- *Education:* Data on smokeless tobacco use is only available for respondents who obtained up to a high school diploma or G.E.D. In this population, **3.2%** currently used smokeless tobacco products on some days (Figure 28).
- *Education:* As the level of education increased, so did the percentage of respondents who did not use smokeless tobacco products (Figure 28).
- *Income:* For respondents who reported a household income of “less than \$15,000” to “\$35,000 to \$49,999” as household income decreased, the percentage of respondents who did currently use smokeless tobacco products increased (Figure 29).

**Figure 25. Percentage of respondents who currently use chewing tobacco, snuff, or snus on some days or not at all by gender (Guam: 2020)**



**Figure 26. Percentage of respondents who did not use chewing tobacco, snuff, or snus at all by age (Guam: BRFSS 2020)**

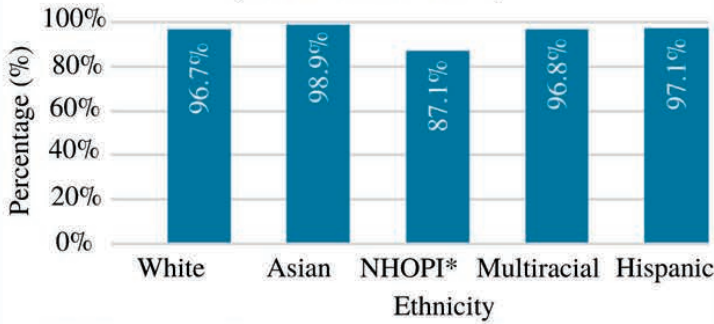


■ Used on some days. ■ Did not use at all.



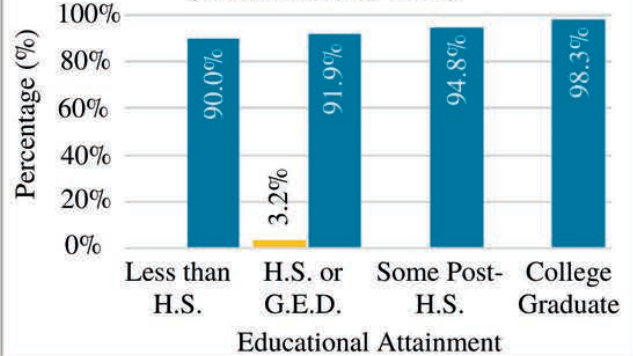
### SMOKELESS TOBACCO (ADULT) CONTINUED

**Figure 27. Percentage of respondents who did not use chewing tobacco, snuff, or snus at all by ethnicity (Guam: BRFSS 2020)**



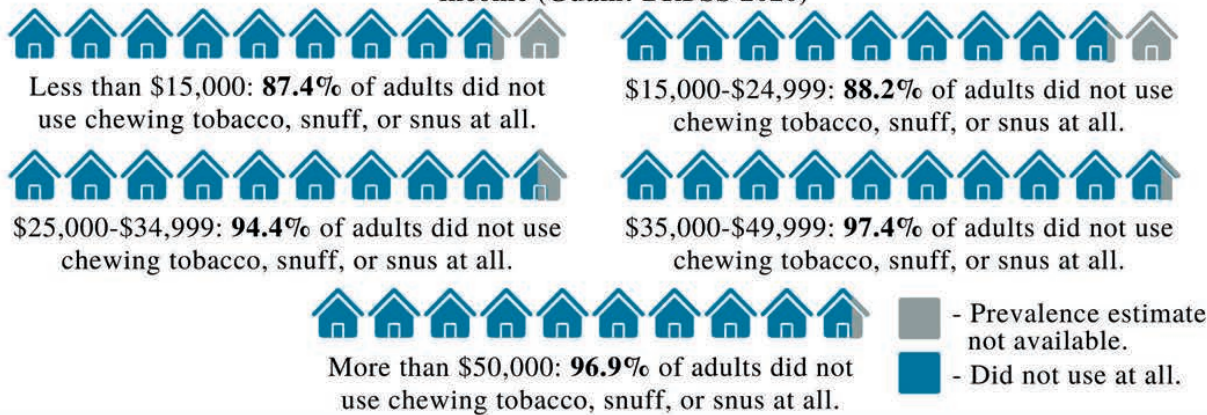
\*NHOPI - Native Hawai'ian or other Pacific Islander

**Figure 28. Percentage of respondents who currently use chewing tobacco, snuff, or snus every day or not at all by educational attainment (Guam: BRFSS 2020)**



■ Used everyday. ■ Did not use at all.

**Figure 29. Percentage of respondents who did not use chewing tobacco, snuff, or snus at all by household income (Guam: BRFSS 2020)**



#### Potential gaps:

- Although data on the use of smokeless tobacco products are unavailable for most demographic groups, information on not using the products can also provide insight.
- From the data, one can infer that more male respondents use smokeless tobacco products than females. This is similar to current smoking data, where more male respondents reported being current smokers than female respondents. This may play a role in the higher prevalence of cancer incidence and mortality in males in Guam.
  - To address this disparity, organizations may tailor tobacco cessation programs to a male audience. Doing so may help decrease the rate of current smoking and smokeless tobacco use among this population.
- Individuals in the youngest age group, 18 to 24 years old, had the lowest percentage of respondents reporting that they do not use smokeless tobacco products. This may imply that, compared to other age groups, a larger percentage of this population, these tobacco products may increase their risk of certain cancers.
  - Tobacco cessation interventions can be tailored to appeal to younger age groups, as they are more likely to use these products.
  - Research may also seek to find out why smokeless tobacco products appeal to younger age groups. Guam data from the 2019 Youth Risk Behavior Survey also reported that about **11.4%** of high school students in Guam used smokeless tobacco products on at least one day during the 30 days before the survey. About 1 in every 10 high school students surveyed used smokeless tobacco products.

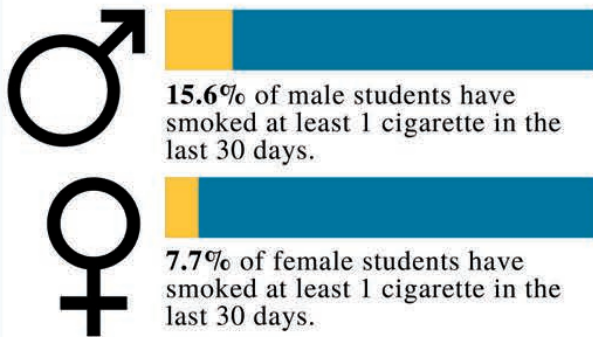
### TOBACCO USE (YOUTH)

The 2019 Youth Behavioral Risk Survey (YBRS) found that of Guam high school students surveyed, **11.9%** (1,218) smoked at least one cigarette in the last 30 days before the survey.

#### Current Situation:

- Based on the data from the YBRS, about 1 in every 10 high school students in Guam reported that they currently smoke. This lifestyle behavior is a risk factor for youth and can contribute to the development of several types of cancer in life.
- *Gender:* The percentage of current male smokers (**15.6%**) doubled that of current female smokers (**7.7%**) (Figure 30).
- *Ethnicity:* Smoking was most prevalent in students who identified as NHOPI (**15.3%**). The percentage of current smokers in this ethnic group was about 7.6 times higher than Asian students, who reported the lowest percentage of current smokers (**2.0%**) (Table 6).
- *Grade:* There was a **5.4%** increase in current smokers from 9th to 10th grade. However, there was a slight decline in the percentage reported current smokers from 10th grade (**13.3%**) to 11th grade (**12.7%**). Students in the 12th grade had the highest rate percentage of current smokers (**13.6%**) (Table 7).

**Figure 30. Percentage of current smokers by gender (Guam: YBRS 2019)**



**Table 6. Percentage of current smokers by ethnicity (Guam: YBRS 2019)**

Ethnic Group	Number of teens	% of Population
Asian	324	2.0%
Hispanic	120	8.9%
Native Hawai'ian or Other Pacific Islander (NHOPI)	516	15.3%
Multiracial	132	6.3%

**Table 7. Percentage of current smokers by grade level (Guam: YBRS 2019)**

Grade Level	Number of Teens	% of Population
Grade 9	561	7.9%
Grade 10	167	13.3%
Grade 11	219	12.7%
Grade 12	262	13.6%

#### Potential Gaps:

- The highest percentage of current smokers was reported in students who identified as NHOPI. Similarly, the BRFSS 2020 survey reported that respondents in the same ethnic category had the second-highest percentage of current smokers (**24.2%**). Relatively higher rates of current smoking may indicate that NHOPI adults and youth, including CHamoru and Micronesian individuals, are more vulnerable to certain cancers.
  - Community outreach and education on cancers that link smoking as a risk factor, such as lung & bronchus cancer, should promote tobacco use, prevention and cessation for this population.
- Similar to BRFSS 2020, more males reported being current smokers than females.
  - Future research may examine what factors lead to higher rates of smoking in males and the impact this may have on their health.

### TOBACCO USE – ELECTRONIC VAPOR PRODUCT (YOUTH)

The 2019 YRBS (Youth Behavioral Risk Survey) found that of students surveyed

- **68.6%** (1,266) have used an electronic vapor product (EVP).\*
- **35.2%** (883) currently use EVP on at least 1 day in the past 30 days.
- **11.0%** (883) use EVP on all 30 days during the 30 days before the survey.
- **5.1%** purchased their EVP from a store within the 30 days before the survey.

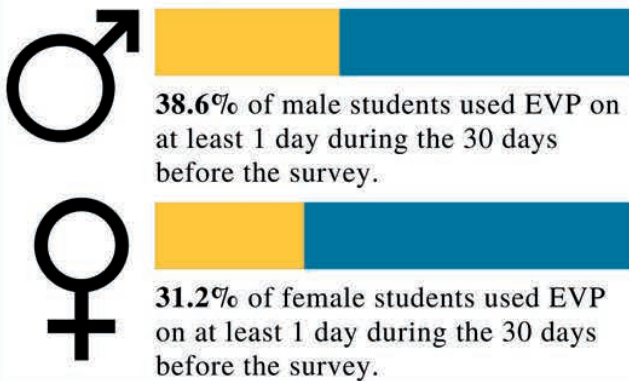
According to the *Guam State Epidemiological Profile: 2018 Update*, EVP use in Guam high school students (**26.5%**) and middle school students (**23.5%**) as of 2017 was higher than the United States median (**13.2%**).

The Guam Code Annotated states, "The sale or distribution of electronic cigarettes to any person under twenty-one (21) years of age, or its possession by such person, is prohibited..."

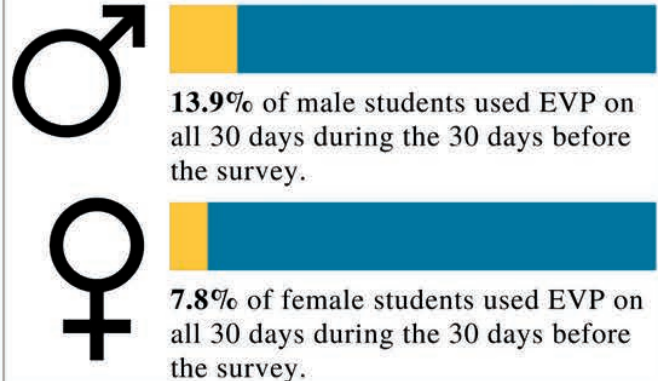
#### Current Situation:

- More than **65%** of all Guam high school students surveyed have tried an EVP. Based on the survey results, 3 out of every 10 high school students in Guam currently use EVP.
- *Gender:* Male students had a higher percentage of current and daily use of EVP than female students (Figures 31 and 32).
- *Ethnicity:* Students who identified as NHOPI had the highest percentage of current (**43.9%**) and daily (**14.4%**) use of EVP (Tables 9 and 10).
- *Grade:* Upperclassmen (11th and 12th grade) had higher percentages of current and daily use of EVP (Tables 12 and 13).

**Figure 31. Percentage of students who currently use EVP by gender (Guam: YRBS 2019)**



**Figure 32. Percentage of students who use EVP daily by gender (Guam: YRBS 2019)**



**Table 8. Students who have used EVP by ethnicity (Guam: YRBS 2019)**

Ethnic Group	Number of Teens	% of Population
Asian	329	53.0%
Hispanic	127	72.3%
Native Hawai‘ian or Other Pacific Islander (NHOPI)	590	74.9%
Multiracial	131	59.8%

**Table 9. Students who currently use EVP\* by ethnicity (Guam: YRBS 2019)**

Ethnic Group	Number of Teens	% of Population
Asian	236	14.9%
Hispanic	83	N/A
Native Hawai‘ian or Other Pacific Islander (NHOPI)	409	43.9%
Multiracial	87	N/A

\**Electronic vapor products (EVP)* include e-cigarettes, vapes, vape pens, e-cigars, e-hookahs, hookah pens, and mods.

**Table 10. Students who currently use EVP daily\*\* by ethnicity (Guam: YRBS 2019)**

Ethnic Group	Number of Teens	% of Population
Asian	236	3.2%
Hispanic	83	N/A
Native Hawai'ian or Other Pacific Islander (NHOPI)	409	14.4%
Multiracial	87	N/A

**Table 11. Students who have used EVP by grade level (Guam: YRBS 2019)**

Grade Level	Number of Teens	% of Population
Grade 9	584	62.2%
Grade 10	171	65.4%
Grade 11	233	79.6%
Grade 12	269	68.9%

**Table 12. Students who currently use EVP\* by grade level (Guam: YRBS 2019)**

Grade Level	Number of Teens	% of Population
Grade 9	398	25.8%
Grade 10	120	32.5%
Grade 11	155	48.9%
Grade 12	202	36.6%

**Table 13. Students who currently use EVP daily\*\* by grade level (Guam: YRBS 2019)**

Grade Level	Number of Teens	% of Population
Grade 9	398	8.1%
Grade 10	120	9.9%
Grade 11	155	11.2%
Grade 12	202	17.0%

\**Current use* is defined as using EVP at least one day during the 30 days before the survey.

\*\**Daily use* is defined as using EVP on all 30 days before the survey.

### Potential Gaps:

- For high school students, current EVP use (**35.2%**) was more prevalent than current smoking (**11.9%**).
  - Research may examine the accessibility of EVP and the factors influencing its use among high school students in Guam.
- Smoking and EVP use was prevalent among NHOPI youth. Students who identified as NHOPI had the highest percentage of ever (**74.9%**), current (**43.9%**), and daily (**14.4%**) use of EVP. NHOPI students are a potentially vulnerable population.
  - Education on the risks of smoking and EVP use should be targeted to this population.
- Like YRBS data on current smoking, male students had a higher percentage of EVP use than female students. Males may be more at risk for the development of certain cancers due to lifestyle risk factors.
  - Male high school students are a population to target for tobacco cessation campaigns.
- Students in 11th grade had the highest percentage of ever (**79.6%**) and current (**48.9%**) EVP use, while those in 12th grade had the highest daily use (**17.0%**). Older students use EVP more than younger students.
  - Educational interventions on EVP and tobacco cessation may target upper-level students as they are more likely to use those products.
- Additionally, **5.1%** of students surveyed reported that they purchased their EVP products from a store. Based on Guam law, the sale of electronic cigarette products to individuals under 21 years old is illegal. However, a small percentage of Guam's youth have been able to purchase the products in stores.
  - The sale of EVP products to individuals under 21 years old is a problem that should be addressed.

### ALCOHOL CONSUMPTION (ADULT)

Alcohol is a preventable cancer lifestyle risk factor. In the United States, alcohol use contributes to an estimated **6%** of all cancers and **4%** of all cancer-related deaths.

Alcohol consumption has been causally linked to several types of cancer. According to the National Cancer Institute (NCI), alcohol-associated cancers include:

- **Esophageal cancer:** The increased risk of developing esophageal squamous cell carcinoma for those who consume alcohol compared to those who do not consume alcohol ranges from 1.3 times higher (light drinking) to 5 times higher (heavy drinking).
- **Liver cancer:** Heavy alcohol consumption is linked with 2 times an increased risk for liver cancer.
- **Breast cancer:** The increased risk of developing breast cancer ranges with the amount of alcohol consumed. For light drinkers, the risk is slightly higher at 1.04 times higher than for non-drinkers. Moderate drinkers have 1.23 times the risk, and heavy drinkers have a 1.6 times higher risk.
- **Colorectal cancer:** Moderate to heavy drinking is linked to a 1.2 to 1.5 times higher risk for colorectal cancer than non-drinkers.
- There is also increasing evidence that links alcohol consumption with an increased risk for melanoma, prostate cancer, and pancreatic cancer.

The 2020 BRFSS found that out of 2,080 adults in Guam surveyed, **41.4% (830)** had at least one drink of alcohol within the past 30 days, while **58.6% (1,250)** did not.

#### **Current situation:**

- **Gender:** Alcohol consumption by adult males (**53.7%**) was almost double that of adult females (**28.6%**) (Figure 33).
- **Age:** Adults 55 to 64 years old had the lowest percentage of respondents to have had at least one drink in the past 30 days (**29.9%**) In contrast, about half (**50.4%**) of the respondents between 25 to 34 years old had at least one alcoholic drink in the past 30 days (Figure 34).
- **Ethnicity:** Compared to the other ethnic groups, a significantly higher percentage of White respondents consumed at least one alcoholic drink within the past 30 days (**63.7%**). The percentage of Whites who had at least one drink was double that of Asians (**31.9%**), who had the lowest percentage among the ethnic groups (Figure 35).
- **Education:** As educational attainment and annual household income increased, so did the percentage of respondents who consumed at least one alcoholic drink within the last 30 days (Figures 36 and 37).
  - About half of the respondents who were college graduates (**50.2%**) reported having had at least one alcoholic drink in the past 30 days. This is about 1.4 times greater than the percentage of individuals with less than a high school education who confirmed having at least one alcoholic drink in the past 30 days (**35.5%**) (Figure 36).
  - About half (**52.4%**) of the respondents with a household income of \$50,000 or more answered, “yes” to having at least one drink in the 30 days before the survey. This is about 2.4 times greater than the number of respondents with a household income of \$15,000 or less (**21.4%**) that answered “yes” to the same question (Figure 37).



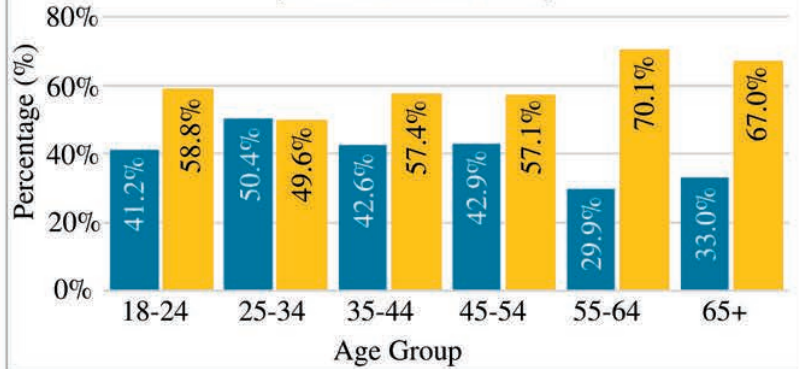
**Note:** The discussion on potential gaps for alcohol consumption and heavy drinking has been grouped together and will be discussed in the next section.

### ALCOHOL CONSUMPTION (CONTINUED)

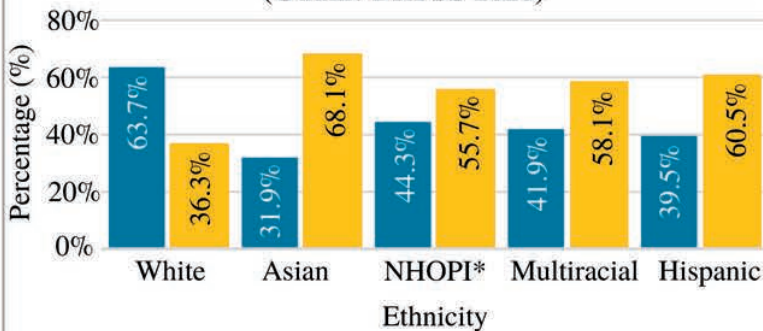
**Figure 33. Percentage of respondents who had at least one drink of alcohol within the past 30 days by gender (Guam: BRFSS 2020)**



**Figure 34. Percentage of respondents who had at least one drink of alcohol within the past 30 days by age (Guam: BRFSS 2020)**

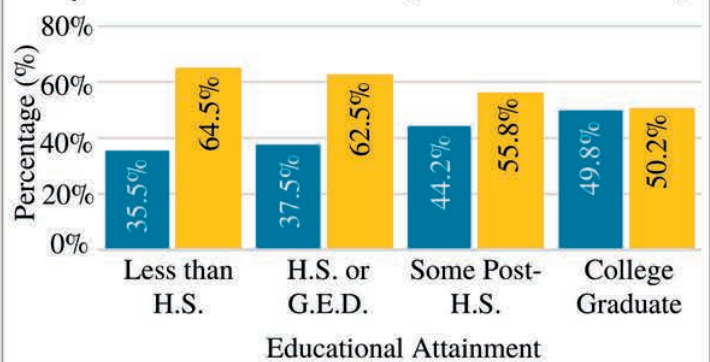


**Figure 35. Percentage of respondents who had at least one drink of alcohol within the past 30 days by ethnicity (Guam: BRFSS 2020)**

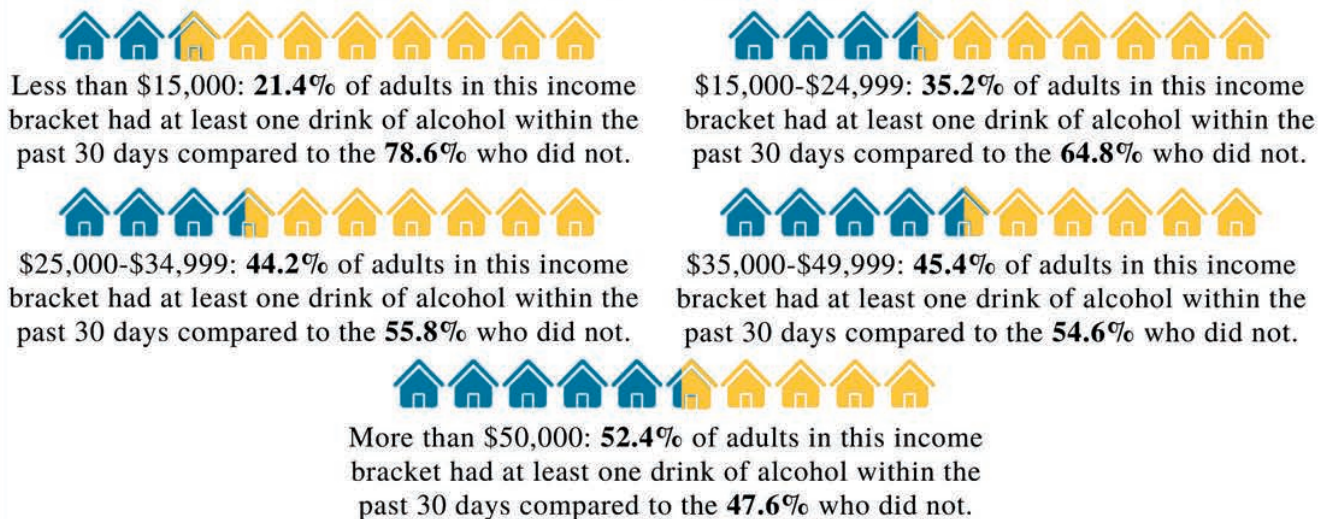


\*NHOPI - Native Hawai'ian or Other Pacific Islander

**Figure 36. Percentage of respondents who had at least one drink of alcohol within the past 30 days by educational attainment (Guam: BRFSS 2020)**



**Figure 37. Percentage of respondents who had at least one drink of alcohol within the past 30 days by household income (Guam: BRFSS 2020)**



■ Yes - Drank alcohol. ■ No - Did not drink alcohol.

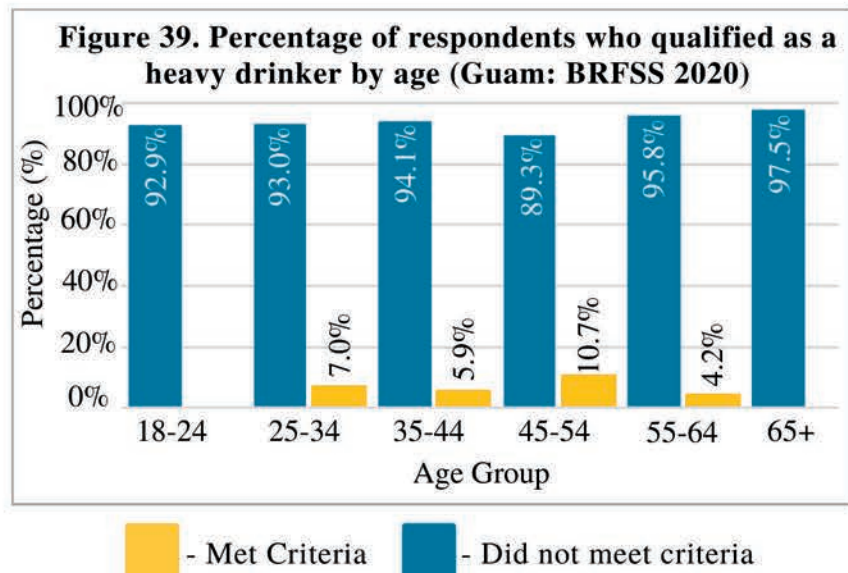
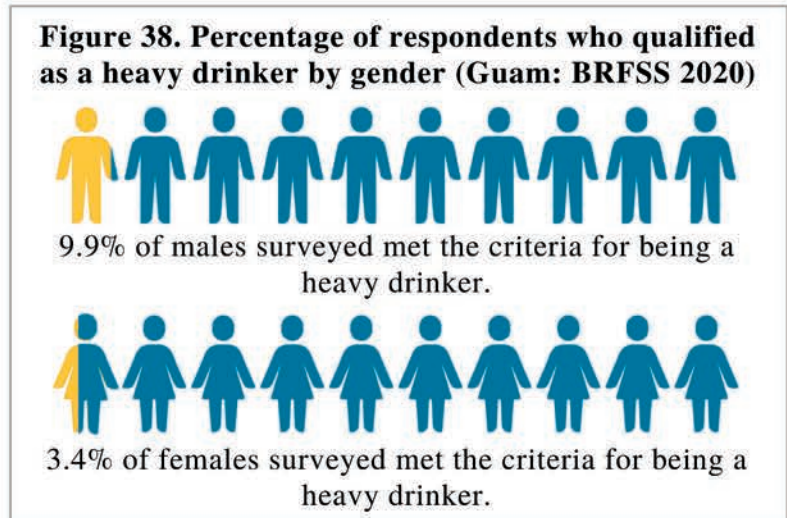
### ALCOHOL CONSUMPTION HEAVY DRINKING (ADULT)

The BRFSS 2020 reported that out of 2,063 adults in Guam surveyed, **93.3%** (1,940) did not meet the criteria for being a heavy drinker\*, while **6.7%** (123) did meet the criteria.

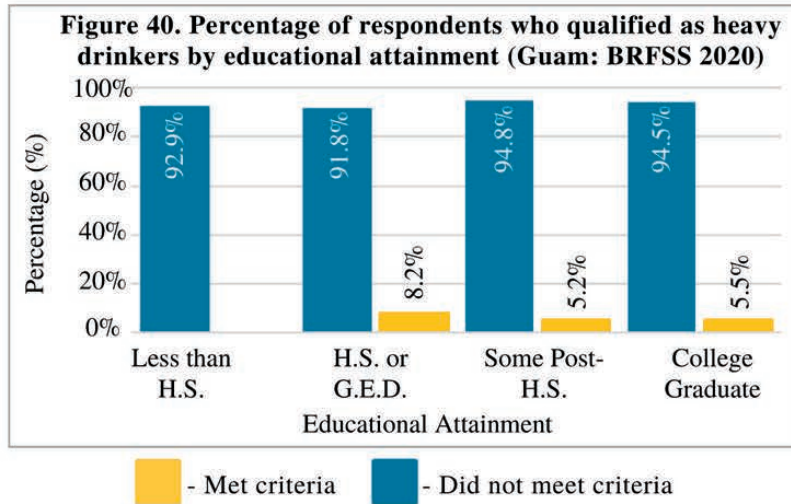
\*A **heavy drinker** is defined as an adult man who has more than 14 drinks per week or an adult woman who have more than 7 drinks per week.

#### Current situation:

- **Gender:** The percentage of males (**9.9%**) who met the criteria for being heavy drinkers was nearly triple that of females (**3.4%**) (Figure 38).
- **Age:** The age gap with the highest percentage of reported heavy drinkers was between 45 to 54 years old (**10.7%**). This was about 2.5 times greater than those who met the criteria between the ages of 55 to 64 years of old (**4.2%**), which was the age group with the lowest percentage of heavy drinkers (Figure 39).
- **Education:** As education increased, the percentage of respondents who met the criteria generally decreased. For the groups with available data, respondents with a high school diploma or G.E.D. had the highest percentage of respondents with who met the criteria for being heavy drinkers (**8.2%**). The percentage of reported heavy drinkers declined in subsequent groups. Individuals with some post-high school education (**5.2%**) and those who graduated college (**5.5%**) had fewer participants to have met the criteria (Figure 40).
- **Ethnicity:** Though there is a lack of data on heavy drinkers by race/ethnicity, Whites had a higher percentage of respondents who met the criteria for heavy drinking (**9.2%**) compared to NHOPI (**7.4%**) (Table 14).
- **Income:** Data on individuals who met the criteria for being heavy drinkers were only available for those with an annual household income of \$50,000 or more (**6.4%**) (Table 15).



### ALCOHOL CONSUMPTION HEAVY DRINKING (ADULT) CONTINUED



**Table 14. Percentage of respondents who qualified as a heavy drinker by ethnicity (Guam: BRFSS 2020)**

	White	Asian	NHOPI*	Multiracial	Hispanic
Met the criteria	9.2%	-	7.4%	-	-
Did not meet the criteria	90.8%	97.4%	92.6%	89.9%	93.4%

\*NHOPI - Native Hawai'ian or other Pacific Islander

**Table 15. Percentage of respondents who qualified as a heavy drinker by household income (Guam: BRFSS 2020)**

	Less than \$15,000	\$15,000 - \$24,999	\$25,000 - \$34,999	\$35,000 - \$49,999	\$50,000+
Met the criteria	-	-	-	-	6.4%
Did not meet the criteria	96.4%	93.4%	94.8%	94.2%	93.6%

#### **Potential Gaps (alcohol consumption and heavy drinking):**

- Based on the BRFSS data, about 4 out of every 10 respondents consumed alcohol on at least one day in the 30 days before the survey, and 6 out of every 100 respondents qualified as heavy drinkers. One may find that certain groups in Guam that have reported higher alcohol consumption rates, in general, and for heavy drinking, have higher incidence and mortality rates for alcohol-associated cancers.
- Male respondents had a higher percentage of alcohol consumption (53.7%) and heavy drinking (9.9%) in comparison to females (28.6%, 3.4%). Table 16 provides a comparison of cancer cases diagnosed and cancer-related deaths recorded for males and females between 2013 to 2017 in Guam for cancers where alcohol consumption is a risk factor. In this time period, more cancers were diagnosed and deaths were recorded for males compared to females. Therefore, males may be a more vulnerable population as alcohol consumption, and other lifestyle risk factors reported more frequently in males, may play a role in the development of cancers.
  - The number of liver cancer cases diagnosed in males (61) was 3.5 times greater than the cases diagnosed in females (17).
  - Colorectal cancer deaths recorded for males (39) were about 2.8 times higher than the deaths recorded for females (14).



### ALCOHOL CONSUMPTION HEAVY DRINKING (ADULT) CONTINUED

**Table 16. Comparison of male and female cancer incidence and mortality overall for alcohol-associated cancers (Guam: 2013-2017)**

	Males		Females	
	Incidence: cases diagnosed	Mortality: deaths recorded	Incidence: cases diagnosed	Mortality: deaths recorded
Overall	804	455	783	351
Liver	61	62	17	17
Colorectal	106	47	71	35

Highlighted in blue is the gender with the highest number of cases diagnosed or deaths recorded by cancer.

- Among age groups, individuals between 45 to 54 years old had the highest percentage of heavy drinking (10.7%).
  - Between 2013-2017 in Guam, the greatest frequency of liver cancer diagnosis occurred in those between the ages of 50-59 years old (31 cases). Heavy alcohol consumption between 45 to 54 years
- Individuals who identified as White had the highest percentage of alcohol consumption (63.7%) and heavy drinking (9.2%). Though they comprise a smaller percentage of the population in Guam, the incidence and mortality rates for colorectal cancer was highest in this ethnic group in comparison to other groups (Table 17).
  - Higher incidence and mortality rates indicate that White individuals may be more vulnerable to colorectal cancer.
- Notably, NHOPI had the second highest percentage of respondents who consumed at least one alcoholic drink in the last 30 days (44.3%) and reported that 7.4% of respondents met the criteria to be heavy drinkers.
  - In comparison to other ethnic groups, CHamorus had the second highest incidence and mortality rates for colorectal cancer (Table 17).

**Table 17. Comparison of colorectal cancer incidence and mortality by ethnic groups (Guam: 2013 – 2017)**

Ethnic Group	CRC incidence rate	CRC mortality rate
Caucasian	47.5	26.6
CHamoru	41.0	23.2
Filipino	25.8	12.8
Total Guam	32.3	17.3
Total U.S.	40.3	14.2

Incidence rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.

Highlighted in blue are the highest incidence and mortality rates for colorectal cancer among ethnic groups in Guam.

- Educational initiatives may promote reducing alcohol consumption as a form of cancer prevention. The community should be informed about the increased risk of developing certain cancers due to alcohol consumption along with other risk factors. This type of initiative may target populations that reported the highest rates of alcohol consumption and heavy drinking.
  - Individuals who may be most vulnerable to the development of certain cancers in relation to alcohol consumption include males, those between 45 to 54 years old, Whites and NHOPI, and those with a household income of \$50,000 or more.

### ALCOHOL CONSUMPTION (YOUTH)

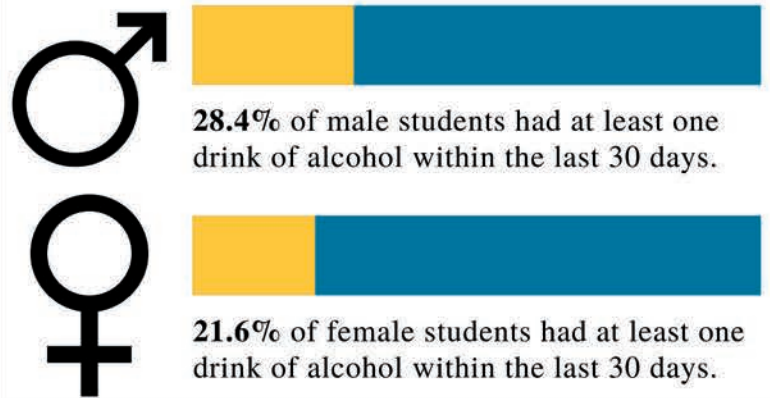
The 2019 YRBS reported that **25.3%** (1,107) of Guam high school students surveyed had at least one alcoholic drink on at least one day during the 30 days before the survey.

**Current situation:**

- Based on the YRBS survey data, about 1 in every 4 high school students surveyed had at least one alcoholic drink on at least one day in the past 30 days before the survey.
- *Gender:* The percentage of male students who reported having at least one drink in the past 30 days (**28.4%**) was **6.8%** higher than the percentage of female students (**21.6%**) (Figure 41).
- *Ethnicity:* Among the ethnic groups surveyed, NHOPI had the highest percentage of students who reported having at least one alcoholic drink (**31.3%**). Compared to Asian students, who had the lowest percentage of students to report having at least one drink (**11.8%**), the rate for NHOPI was 2.6 times greater (Figure 18).
- *Grade:* As grade level increased, so did the percentage of students who had at least one alcoholic drink on one day in the 30 days preceding the survey. Students in 12th grade had the highest percentage (**36.1%**). This was about 2.4 times greater than the percentage for 9th-grade students, who had the lowest percentage of students to report having at least one alcoholic drink (**14.9%**) (Table 19).



**Figure 41. Percentage of respondents who had at least one alcoholic drink on at least one day in the past 30 days before the survey by gender (Guam: YRBS 2019)**



**Table 18. Percentage of respondents who had at least one alcoholic drink on at least one day in the past 30 days before the survey by ethnicity (Guam: YRBS 2019)**

Ethnic Group	Number of teens	% of Population
Asian	307	11.8%
Hispanic	100	28.5%
Native Hawai'ian or Other Pacific Islander (NHOPI)	502	31.3%
Multiracial	123	14.6%

**Table 19. Percentage of respondents who had at least one alcoholic drink on at least one day in the past 30 days before the survey by grade level (Guam: YRBS 2019)**

Grade Level	Number of Teens	% of Population
Grade 9	512	14.9%
Grade 10	144	22.4%
Grade 11	207	32.7%
Grade 12	237	36.1%

**Note:** The discussion on potential gaps for alcohol consumption and binge drinking has been grouped together and will be discussed in the next section.

### ALCOHOL CONSUMPTION – BINGE DRINKING (YOUTH)

The 2019 YRBS survey reported that **8.2%** (1,161) of Guam high school students were currently binge drinking on at least one day during the 30 days before the survey.

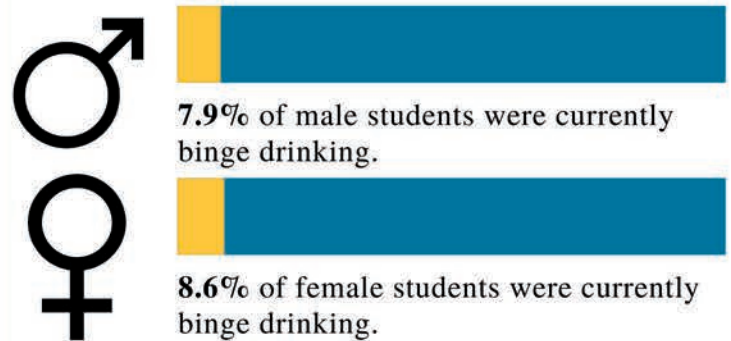
**Binge drinking** is defined as four or more drinks of alcohol in a row for female students or five or more drinks of alcohol in a row for male students within a couple of hours.

**Current situation:**

- Based on the YRBS survey data, about 8 out of every 100 high school students in Guam binge drank on at least one day in the 30 days before the survey.
- *Gender:* Despite a larger percentage of male students reporting that they consumed at least one alcoholic drink in the past 30 days prior to the survey, a slightly higher percentage of female students reported binge drinking (**8.6%**) in comparison to male students (**7.9%**) (Figure 42).
- *Ethnicity:* Students who identified as Hispanic had the highest percentage of binge drinking (**11.0%**). The percentage of Hispanic students who reported binge drinking was about 3.3 times greater than the multiracial students, who had the lowest percentage of students to report binge drinking (**3.3%**) (Table 20).
- *Grade:* Similar to Guam data on current alcohol consumption in students, as grade level rises, so does the percentage of students who are currently binge drinking. Students in 12th grade had the highest percentage of individuals to report currently binge drinking in the past 30 days before the survey (**12.3%**). The binge drinking is about 3.2 times higher than the percentage of 9th-grade students (**3.8%**) (Table 21).



**Figure 42. Percentage of respondents who were binge drinking on at least one day in the past 30 days before the survey by gender (Guam: YRBS 2019)**



**Table 20. Percentage of respondents who were binge drinking on at least one day in the past 30 days before the survey by race (Guam: YRBS 2019)**

Ethnic Group	Number of teens	% of Population
Asian	320	3.4%
Hispanic	115	11.0%
Native Hawai‘ian or Other Pacific Islander (NHOPI)	524	10.3%
Multiracial	123	3.3%

**Table 21. Percentage of respondents who were binge drinking on at least one day in the past 30 days before the survey by grade level (Guam: YRBS 2019)**

Grade Level	Number of Teens	% of Population
Grade 9	524	3.8%
Grade 10	157	8.0%
Grade 11	210	11.4%
Grade 12	245	12.3%

### ALCOHOL CONSUMPTION - BINGE DRINKING (YOUTH) CONTINUED

**Potential Gaps (youth alcohol consumption and binge drinking):**

- YRBS data on alcohol consumption for Guam high school students follow similar trends compared to the alcohol consumption data from the Guam BRFSS 2020 survey. This may indicate that alcohol consumption and binge drinking are prevalent in certain adult and youth populations, who may be at greater risk for the development of certain cancers.
  - Similar to data reported on adults in Guam, a higher percentage of male youths reported that they consumed at least one alcoholic drink on at least one day in the 30 days prior to the survey. However, unlike adult data on heavy drinking where the percentage of adult males was 3 times higher than adult females, female students reported a slightly higher percentage of binge drinking.
- For Guam’s adult population, NHOPI had the second highest percentages for alcohol consumption and heavy drinking. NHOPI students had the highest percentages of individuals to report having at least one alcoholic drink on at least one day in the 30 days before the survey (**31.3%**) and the second highest percentage of binge drinking (**10.3%**). As previously noted, alcohol consumption increases an individual’s risk of developing certain cancers, such as colorectal and liver cancers. Tables 17 and 22 compare the incidence and mortality rates for these cancers among the ethnic groups in Guam who have data available.
  - Notably, the Micronesian and CHamoru communities have the highest rates for these cancers among ethnic groups in Guam and in comparison to the average rates for Guam and the US. Higher levels of alcohol consumptions may play a role in greater occurrence of these cancers in Pacific Island populations. Exposure to these risk factors from a young age may also influence one’s likelihood to develop these diseases.
  - In contrast to the NHOPI, Asian youth had the lowest percentage of respondents to report having at least one alcoholic drink on at least one day in the past 30 days before the survey and binge drinking. Similar to youth, Asian respondents of the BRFSS 202 survey had the lowest percentage of alcohol consumption and the second lowest percentage of binge drinking. Between 2013 to 2017 in Guam, Filipinos recorded the lowest incidence and mortality rates for both colorectal and liver cancer as well.

**Table 22. Comparison of liver cancer incidence and mortality by ethnic groups (Guam: 2013 – 2017)**

Ethnic Group	Liver cancer incidence rate	Liver cancer mortality rate
CHamoru	22.0	22.7
Filipino	2.2	2.6
Micronesian	36.2	25.2
Total Guam	12.1	12.2
Total U.S.	7.8	4.9

*Incidence rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.*

Highlighted in **blue** are the highest incidence and mortality rates for liver cancer among ethnic groups in Guam.

- Survey data on alcohol consumption by high school students indicates that as grade level increases, so does the percentage of students who had consumed alcohol on at least one day in the 30 days before the survey and/ or were binge drinking.
  - Research to examine the prevalence of drinking in young adults, especially those in their junior and senior years, should be conducted.
  - Educational interventions on the risk alcohol consumption pose to the development of cancer can be explored.

### HEALTH CARE COVERAGE (ADULT)

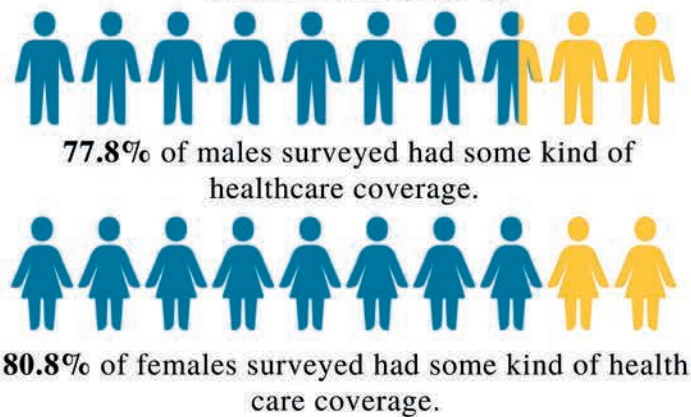
Health care coverage may influence an individual’s ability to receive cancer screening and treatment. Individuals who do not have reliable access to health care are more likely to be diagnosed in the later stages of cancer, when there may be fewer treatment options available (National Cancer Institute).

The BRFSS 2020 survey reported that of the 2,174 Guam adult survey respondents, **79.3%** (1,830) reported having some kind of health care coverage while **20.7%** (344) did not.

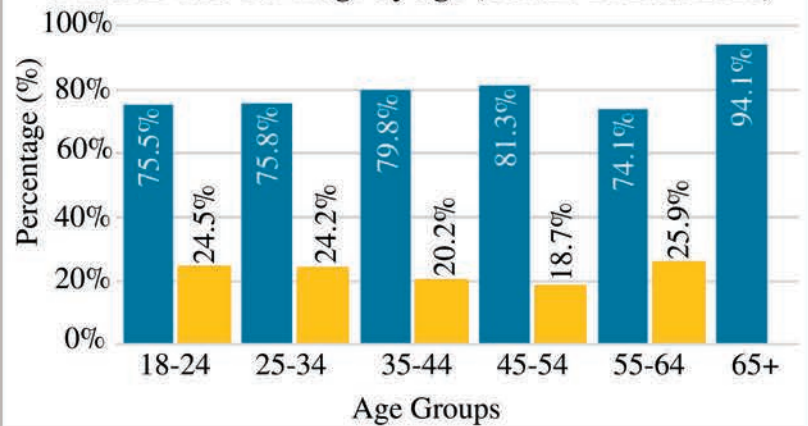
#### Current situation:

- The survey data indicates that about 4 out of every 5 survey respondents had some form of health care coverage.
- *Gender:* A slightly greater percentage of females (**80.8%**) had some form of health coverage compared to males (**77.8%**) (Figure 43).
- *Age:* Respondents who were 65 years or older had the highest percentage of respondents with health care coverage (**94.1%**). Compared to the 55 to 64 age group (**74.1%**), the percentage of respondents with 65+ with health care coverage was 1.3 times greater (Figure 44).
- *Ethnicity:* Individuals who identified as White had the highest percentage of respondents to report having health care coverage (**95.2%**). Those who identified as multiracial had the lowest percentage of respondents with health care coverage (**70.6%**) (Figure 45).
- *Education:* As education increased, so did the number of respondents who had health care coverage. The percentage of college graduates who reported having some form of health care coverage (**88.2%**) was about 1.2 times greater than those with less than a high school education (**71.6%**) (Figure 46).
- *Income:* In general, as household income rises so does the percentage of respondents to report having healthcare coverage. Individuals with a household income of \$50,000 or more had the highest percentage of respondents to have health care coverage (**92.5%**) (Figure 47).

**Figure 43. Percentage of respondents who have any kind of health care coverage by gender (Guam: BRFSS 2020)**



**Figure 44. Percentage of respondents who have any kind of health care coverage by age (Guam: BRFSS 2020)**

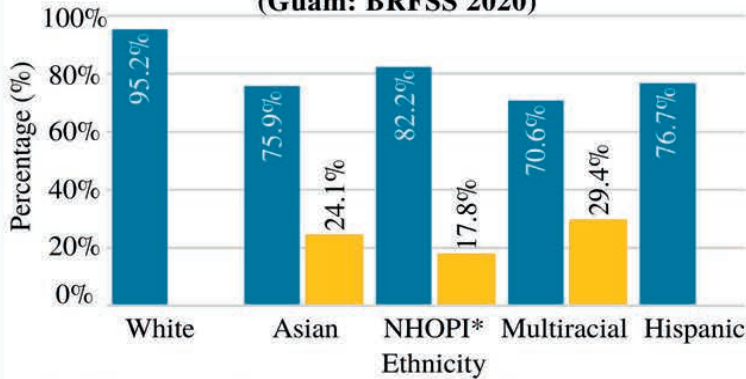


■ Yes - Has healthcare coverage.  
 ■ No - Does not have healthcare coverage.



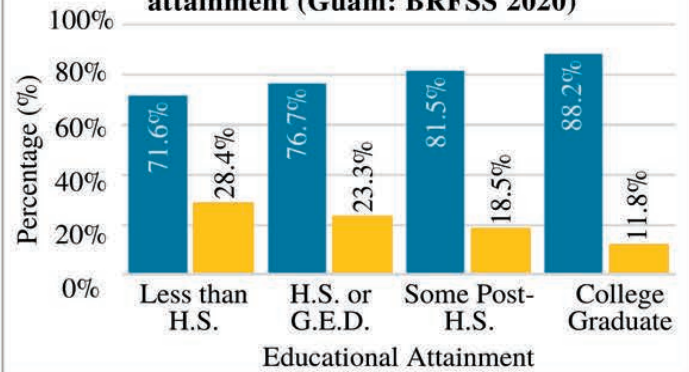
### HEALTH CARE COVERAGE (CONTINUED)

**Figure 45. Percentage of respondents who have any kind of health care coverage by ethnicity (Guam: BRFSS 2020)**

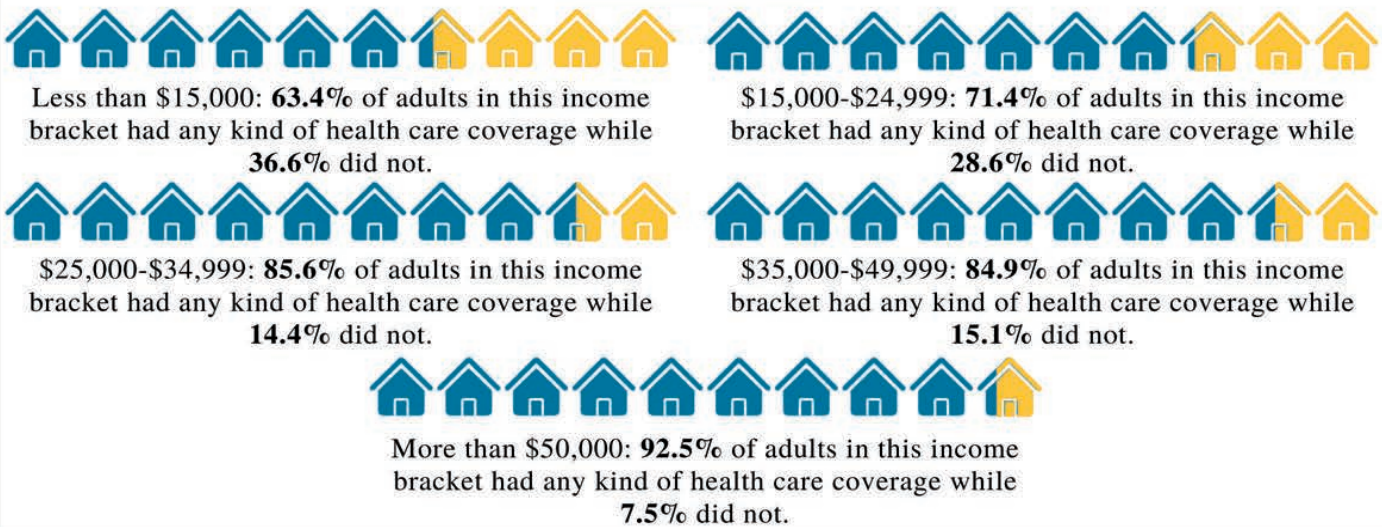


\*NHOPI - Native Hawai'ian or other Pacific Islander

**Figure 46. Percentage of respondents who have any kind of health care coverage by educational attainment (Guam: BRFSS 2020)**



**Figure 47. Percentage of respondents who have any kind of health care coverage by household income (Guam: BRFSS 2020)**



■ Yes - Has healthcare coverage. ■ No - Does not have healthcare coverage.

#### Potential Gaps:

- Health care coverage provides access to cancer-related services. A lack of access may hinder one's ability to detect cancer early through screening or to treat cancer. BRFSS data aids in highlighting those who may lack access to healthcare and therefore, are more vulnerable to cancer incidence and mortality.
- Data indicates that a slightly lower percentage of male respondents had health care coverage in comparison to female respondents. About **22.2%** of male survey respondents did not have any form of health care coverage. From 2013 to 2017, cancer incidence and mortality for certain cancers were higher in male populations in comparison to females, as seen in Table 16. A lack of health care coverage may hinder access to cancer treatment and care for cancer survivors.
- Survey respondents who identified as Asian had the second highest percentage of individuals to report that they did not have any form of health care coverage (**24.1%**).
  - A lack of health care coverage in the Asian population may imply a lack of access to screening services which may lead to late-stage diagnosis. Between 2013 to 2017, Filipinos reported high percentages of late-stage diagnoses for several cancers. For example, **50%** of colorectal cancer cases diagnosed in Filipinos were identified in the late stages.

### HEALTH CARE COVERAGE (CONTINUED)

- Access to healthcare also allows individuals to receive cancer screenings within the recommended time intervals. Table 23 references the U.S. Preventive Services Task Force (USPSTF)’s recommended ages to screen for several types of cancer.
  - Individuals between the ages of 55 to 64 years old had the lowest percentage of respondents with health care coverage (**74.1%**). Individuals in this age group are eligible to screen for 3 to 5 types of cancer. A lack of access may hinder an individual’s ability to detect cancers early and may lead to late-stage diagnosis.
  - Increasing access to cancer screenings and other health services for those 55 to 64 years old should be explored.

**Table 23. USPSTF Cancer Screening Age Recommendations\***

Type of Cancer	Screening recommendation
Breast cancer	Females should be screened from 50 to 74 years old.
Cervical cancer	Females should be screened from 21 to 65 years old.
Colorectal cancer	Males and females should be screened from 45 to 75 years old.
Lung cancer	Males and females between the ages of 50 to 80 years who have a 20-pack-year smoking history and currently smoke or have quit within the past 15 years should be screened.
Prostate cancer	Males between 55 to 69 years old, should make an individual decision to undergo periodic screening.

\*USPSTF screening recommendations are for individuals at average risk.

- Individuals with a household income of \$15,000 or less had the lowest percentage of respondents to have access to health care coverage (**63.4%**). More than a quarter of the population (**36.6%**) lack access to any form of health care coverage.
  - Programs may examine ways to increase access to health care coverage for lower-income households.



### OVERWEIGHT AND OBESE (ADULT)

Being overweight or obese is linked with a higher risk of developing 13 types of cancer. These cancers include meningioma, adenocarcinoma of the esophagus, multiple myeloma, and cancer of the breast (post-menopause), kidneys, liver, gallbladder, upper stomach, uterus, pancreas, ovaries, colon & rectum. Notably, this list includes four out of the top ten most frequently diagnosed cancers in Guam between 2013 to 2017 that comprise approximately **37.7%** of all cancers diagnosed.

Body mass index (BMI) is used to determine if an individual is overweight or has obesity. Adults with a BMI between 25.0 to 29.9 are categorized as overweight. While those with a BMI of 30.0 or higher are categorized as having obesity.

The BRFSS 2020 survey reported that out of the 2,020 adult survey respondents in Guam, **34.4%** (630) were categorized as having obesity, **32.6%** (715) were categorized as overweight, and **31.0%** (675) were categorized as normal weight.

#### *Current situation:*

- The survey data indicates that about 1/3 of the adult respondents had obesity, 1/3 were overweight, and 1/3 were normal weight. The percentage of obese individuals (**34.4%**) was slightly higher than those who were overweight (**32.6%**) or normal weight (**31.0%**).
- *Gender:* A slightly higher percentage of female respondents (**35.1%**) were classified as obese in comparison to male respondents (**33.8%**). However, when comparing those classified as overweight, **13.9%** more male respondents (**39.3%**) were overweight compared to female respondents (**25.4%**). Additionally, **11.0%** more female respondents (**36.7%**) were classified as being normal weight compared to male respondents (**25.7%**) (Table 24).
- *Age:* Individuals between the ages of 35 to 44 years old had the highest percentage of those classified as having obesity (**41.2%**). The percentage is about 1.5 times greater than those between 55 to 64 years old (**26.6**), which was the age group with the lowest percentage of respondents classified as having obesity (Figure 48).
- *Age:* Individuals between 45 to 54 years old had the most respondents identify as being overweight (**35.7%**). Additionally, this age group had the second highest percentage of respondents classified as having obesity (**38.1%**) (Figure 48).
- *Ethnicity:* Individuals who identified as NHOPI had the highest percentage of respondents classified as obese (**48.4%**) and the lowest percentage of individuals classified as being normal weight (**21.3%**). The percentage of NHOPI individuals who had obesity was about the 2.6 times greater than the percentage of Asian respondents (**18.6%**), which was the population with the lowest percentage categorized as having obesity (Figure 49).
- *Ethnicity:* Individuals who identified as Hispanic had the highest percentage of respondents to be classified as overweight (**40.4%**). This was followed by those who identified as White (**39.4%**). Despite NHOPI having the highest percentage of respondents to be classified as obese, they had the lowest percentage of respondents to be classified as overweight (**29.8%**) (Figure 49).
- *Education:* At all levels of educational attainment, **64%** or more respondents were classified as overweight or having obesity. This may imply that these lifestyle risk factors impact individuals at all levels of educational attainment (Figure 50).
- *Income:* Individuals with a household income ranging from \$25,000 - \$34,999 had the highest percentage of respondents who had obesity (**41.9%**). Compared to those with a household income of \$50,000 or more (**32.3%**), their percentage was 1.3 times greater (Table 25).
- *Income:* Despite having the lowest percentage of respondents classified as having obesity, individuals with a household income of \$50,000 or more had the highest percentage classified as overweight (**38.1%**). Their percentage is about 1.5 times greater than those with a household income of \$25,000 - \$34,999 (**25.2%**) (Table 25).

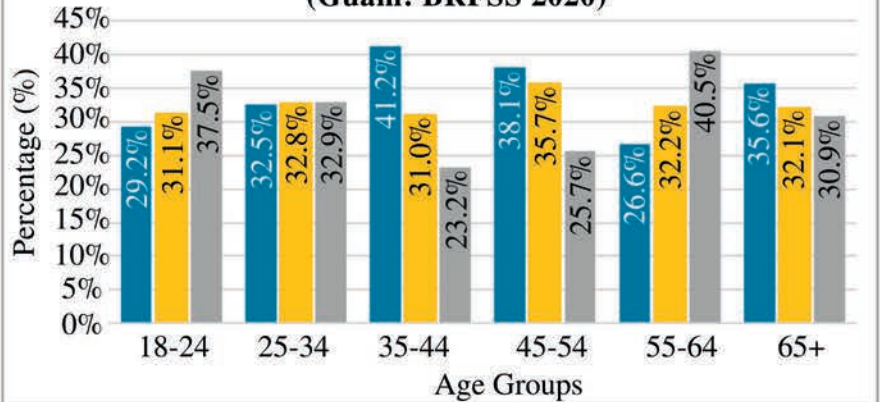


### OVERWEIGHT AND OBESE (CONTINUED)

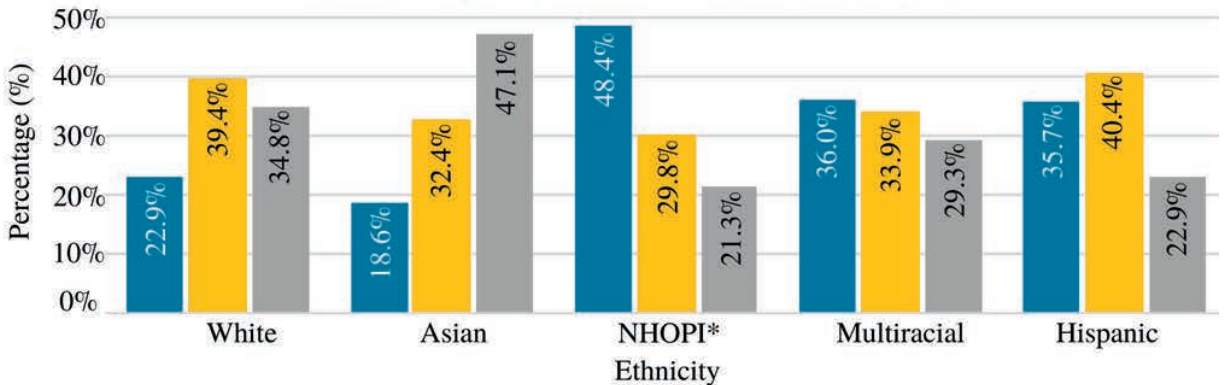
**Table 24. Percentage of respondents who were classified as obese, overweight, or normal weight by gender (Guam: BRFSS 2020)**

Weight classification	Male	Female
Obese (BMI 30.0 - 99.8)	33.8%	35.1%
Overweight (BMI 25.0 - 29.9)	39.3%	25.4%
Normal weight (BMI 18.5 - 24.9)	25.7%	36.7%

**Figure 48. Percentage of respondents who were classified as obese, overweight, or normal weight by age (Guam: BRFSS 2020)**

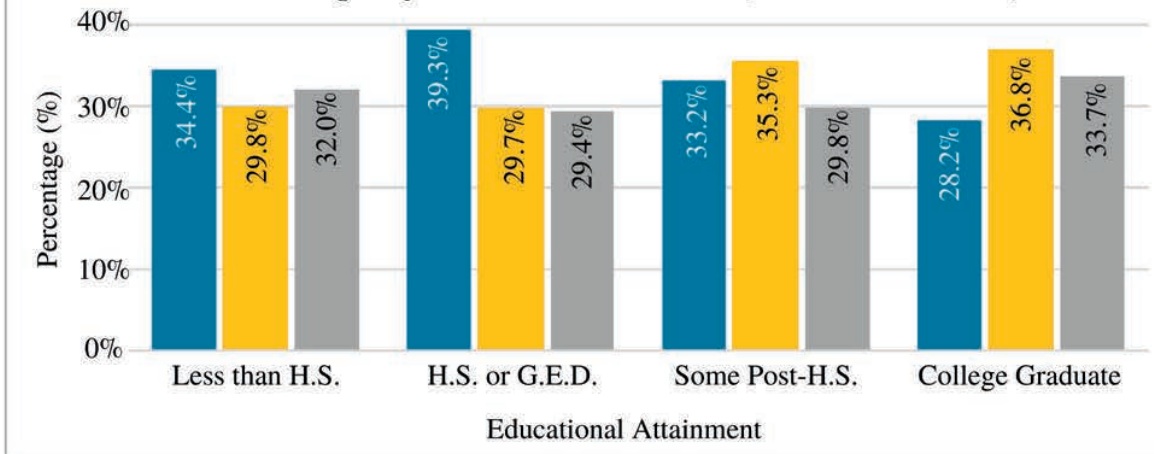


**Figure 49. Percentage of respondents who were classified as obese, overweight, or normal weight by ethnicity (Guam: BRFSS 2020)**



\*NHOPI - Native Hawai'ian or other Pacific Islander

**Figure 50. Percentage of respondents who were classified as obese, overweight, or normal weight by educational attainment (Guam: BRFSS 2020)**



■ - Obese ■ - Overweight ■ - Normal weight

### OVERWEIGHT AND OBESE (CONTINUED)

**Table 25. Percentage of respondents who were classified as obese, overweight, or normal weight by household income (Guam: BRFSS 2020)**

Household Income	Obese (BMI 30.0 - 99.8)	Overweight (BMI 25.0 - 29.9)	Normal Weight (BMI 18.5 - 24.9)
Les than \$15,000	32.6%	25.2%	40.3%
\$15,000 - \$24,999	38.2%	29.6%	30.7%
\$25,000 - \$34,999	41.9%	25.2%	25.9%
\$35,000 - \$49,999	33.2%	37.6%	28.1%
\$50,000 +	32.3%	38.1%	28.9%

#### Potential Gaps:

- In Guam, over half of the male (**73.1%**) and female (**60.5%**) respondents were either overweight or had obesity. This places a large portion of the population at greater risk for certain cancers. Table 26 highlights leading cancers in Guam that have linked having obesity or being overweight to higher risks for these cancers.

**Table 26. Incidence for top cancers diagnosed in Guam that link being overweight or obese as a risk factor (2013-2017)**

Cancer	Number of cases (males)	% of overall cancers diagnosed for males	Number of cases (females)	% of overall cancers diagnosed for females	Number of cases (overall)	% of cancers diagnosed overall
Breast	-	-	267	33.8%	267	16.8%
Liver	61	7.6%	17	2.2%	78	4.9%
Uterus	-	-	76	9.7%	76	4.8%
Prostate	175	21.8%	-	-	175	11.0%

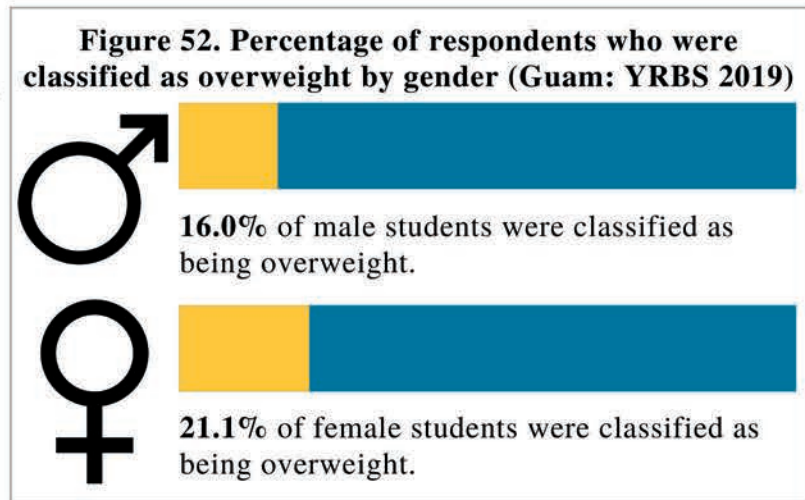
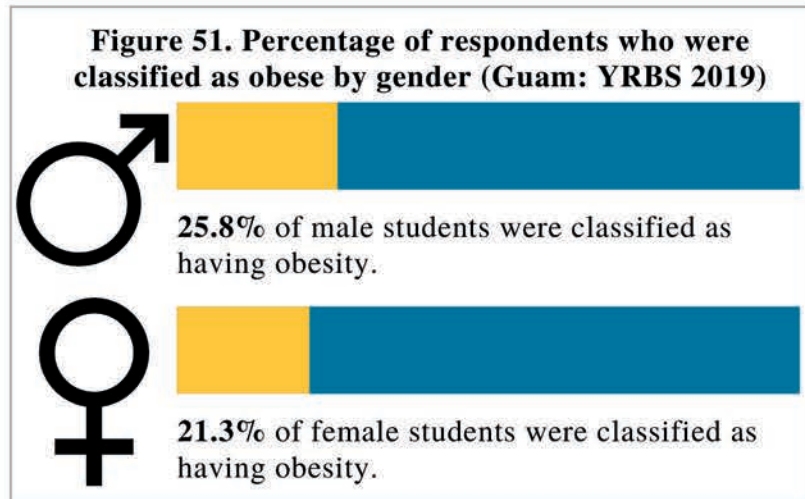
- Respondents between the ages of 35 to 44 years old had the highest percentage of respondents in their age group to be categorized as having obesity, while those 45 to 54 years old had the highest percentage of respondents to be classified as overweight. There is an overlap for those in their 40s. Between 2013 to 2017, about **9%** of colorectal cancer cases were diagnosed in individuals between 40 to 49 years old. Obesity or being overweight may be a risk factor that increased the likelihood of developing this cancer.
- Notably, NHOPI had the highest percentage of respondents that had obesity (**48.4%**) and the lowest percentage of respondents who were categorized as being normal weight (**21.3%**).
  - There are several cancers in which CHamoru and Micronesian populations have higher incidence rates compared to other ethnic groups in Guam and the average incidence rates for Guam and the United States. For example, the liver cancer incidence rate for the Micronesian population (**36.2**) was about 3 times greater than the average incidence rate for Guam (**12.1**). For these cancers, obesity and being overweight may be risk factors that increase the likelihood of development for the CHamoru and Micronesian populations. Therefore, these populations may be more vulnerable.
  - Outreach programs and interventions to promote healthy lifestyles and education the community on the risks of obesity and being overweight may target the CHamoru and Micronesian populations.

### OVERWEIGHT AND OBESE (YOUTH)

The 2019 YRBS survey reported on the number of students who were classified as having obesity or being overweight. Having obesity was defined as being in the 95th percentile for body mass index (BMI) while being overweight was classified as being in the 85th percentile but less than the 95th percentile for BMI. Of the Guam high school students surveyed, **23.8%** had obesity and **18.3%** were overweight.

**Current situation:**

- Overall, about 1/5 of Guam’s students had obesity or were overweight. These conditions are risk factors that may contribute to the development of certain cancers.
- *Gender:* Of the Guam high school student surveyed, about a quarter of male students (**25.8%**) and about a fifth of female students (**21.3%**) were classified as obese. A slightly higher percentage of male students were classified as obese in comparison to female students (Figure 51).
- *Gender:* A higher percentage of female students were classified as overweight (**21.1%**) in comparison to male students (**16.0%**) (Figure 52).
- *Ethnicity:* Respondents who identified as NHOPI had the highest percentage of students classified as either having obese (**26.6%**) or being overweight (**20.9%**). Their percentage of obesity was 1.6 times greater than that of multiracial students, who had the lowest percentage classified as obese (**16.6%**) (Table 27).
- *Grade:* Eleventh grade had the highest percentage of students to be categorized as having obesity (**28.0%**) (Table 28).
- *Grade:* Despite having the lowest percentage of students to be classified as having obesity (**18.8%**), those in tenth grade had the highest percentage of respondents classified as overweight (**23.4%**) (Table 28).



**Table 27. Respondents who were classified as overweight or had obesity by ethnicity (Guam: YRBS 2019)**

Ethnic Group	Number of students classified as obese	Percentage of students classified as obese	Number of students classified as overweight	Percentage of students classified as overweight
Asian	327	17.4%	327	12.8%
Hispanic	125	21.3%	125	11.0%
Native Hawai‘ian or Other Pacific Islander (NHOPI)	571	26.2%	571	20.9%
Multiracial	129	16.6%	129	14.6%

### OBESE AND YOUTH (CONTINUED)

Table 28. Respondents who were classified as overweight or had obesity by grade level (Guam: YRBS 2019)

Grade Level	Number of students classified as obese	Percentage of students classified as obese	Number of students classified as overweight	Percentage of students classified as overweight
Grade 9	566	24.5%	566	18.5%
Grade 10	169	18.8%	169	23.4%
Grade 11	225	28.0%	225	12.7%
Grade 12	266	24.4%	266	18.0%

**Potential Gaps:**

- Overall, almost a quarter of the Guam high school students surveyed were classified as having obesity (23.8%) and about a fifth (18.3%) were classified as overweight. This may place students at greater risk for developing non-communicable diseases, such as cancer, in their lifetimes.
  - Interventions may be developed to promote healthy lifestyle choices that decrease the number of students classified as obese or overweight.
- Interventions may also focus on students in 10th to 11th grade as they have the highest percentages of being classified as being overweight or having obese.
- NHOPI students had the highest percentage of respondents classified as having obesity and being overweight. In a similar manner, NHOPI adults had the highest percentage of respondents classified as having obesity. This similarity may help shed light on populations in Guam whose youth and adults have a higher rates of obesity and being overweight. These populations may be at greater risk for the development of certain cancers.



### PHYSICAL ACTIVITY (ADULT)

The National Cancer Institute defines physical activity as “any movement that uses skeletal muscles and requires more energy than resting.” Strong evidence from observational studies has found that higher amounts of physical activity are linked to a lower risk of developing certain cancers. This includes cancers of the bladder, breast, colon, endometrium, esophagus, kidneys, and stomach.

In contrast, according to the National Cancer Institute, sedentary behaviors are a risk factor for several chronic conditions and may be linked with an increased risk for certain cancers. Sedentary behaviors include activities such as sitting or lying down for extended periods of time aside from sleep.

The BRFSS 2019 survey reported that of the 2,126 Guam adult survey respondents, **20.9%** (483) participated in enough aerobic and muscle strengthening exercises to meet guidelines while **79.1%** (1,686) did not.

#### Current Situation:

- **Gender:** The percentage of male respondents (**25.8%**) who met the physical activity guidelines was 1.6 times greater than female respondents (**16.0%**) (Figure 53).
- **Age:** The 18 to 4 age group had the most respondents who met the guidelines (**27.0%**). Notably, the rate declined for individuals 55 to 64 years old, who reported the lowest percentage (**17.3%**) of respondents to have met the guidelines for physical activity. There was a **4.9%** increase for adults 65 years and older (Figure 54).
- **Ethnicity:** Whites had the most respondents who met the guidelines for physical activity (**34.2%**). The percentage of respondents who met the guidelines was about 2.6 times greater than Hispanics (**13.2%**) and 2.1 times greater than Asian respondents (**16.0%**) (Figure 55).
- **Education:** As educational attainment increased, so did the percentage of respondents that met the guidelines. The only decline was seen between those with some post-high school education (**23.5%**) and college graduates (**23.4%**) where the difference is **0.1%** (Figure 56).
  - A significantly lower percentage of respondents with less than a high school education met the guidelines (**12.8%**) compared to the other populations. The percentage of respondents with some post-high school education who met the guidelines was 1.8 times greater than those with less than a high school education (Figure 56).
- **Income:** Those with a household income of \$50,000 or more had the most respondents to meet the guidelines (**27.7%**). The percentage of this population who met the guidelines was about 2.4 times greater than respondents with a household income ranging from \$15,000 to \$24,999 (**11.6%**) (Figure 57).

**Figure 53. Percentage of respondents who met and did not meet the aerobic and muscle strengthening exercises guidelines by gender (Guam: BRFSS 2019)**

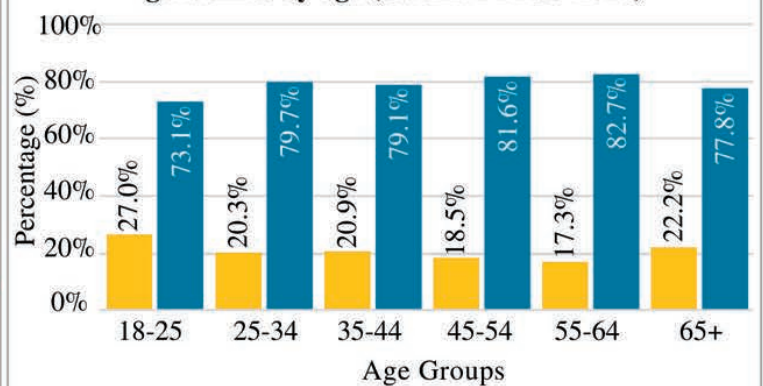


**25.8%** of males participated in enough aerobic and muscle strengthening exercises to meet guidelines.



**16.0%** of females participated in enough aerobic and muscle strengthening exercises to meet guidelines.

**Figure 54. Percentage of respondents who met and did not meet the aerobic and muscle strengthening exercises guidelines by age (Guam: BRFSS 2019)**



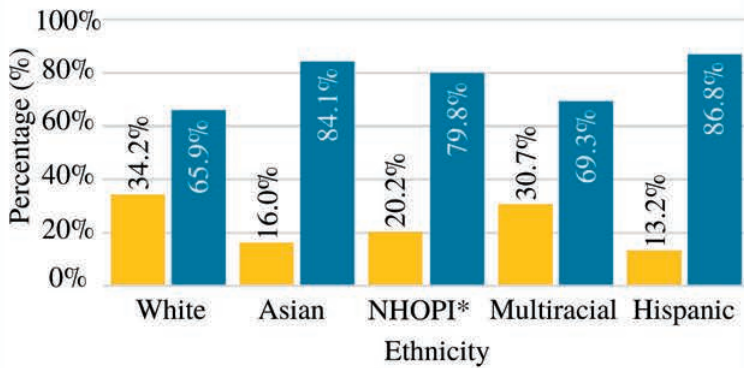
- Met the guidelines.



- Did not meet the guidelines.

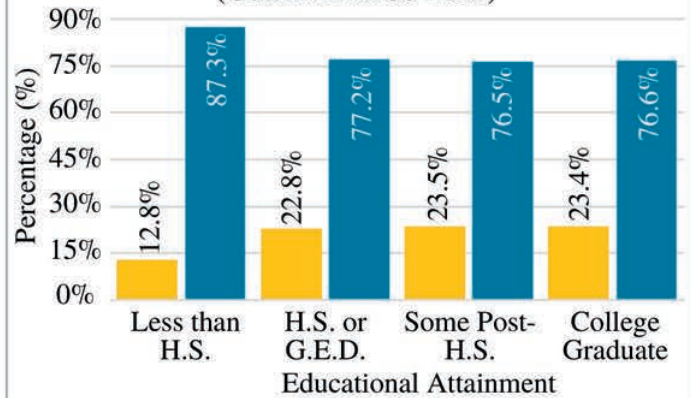
### PHYSICAL ACTIVITY (ADULT) CONTINUED

**Figure 55. Percentage of respondents who met and did not meet the aerobic and muscle strengthening exercises guidelines by ethnicity (Guam: BRFSS 2019)**

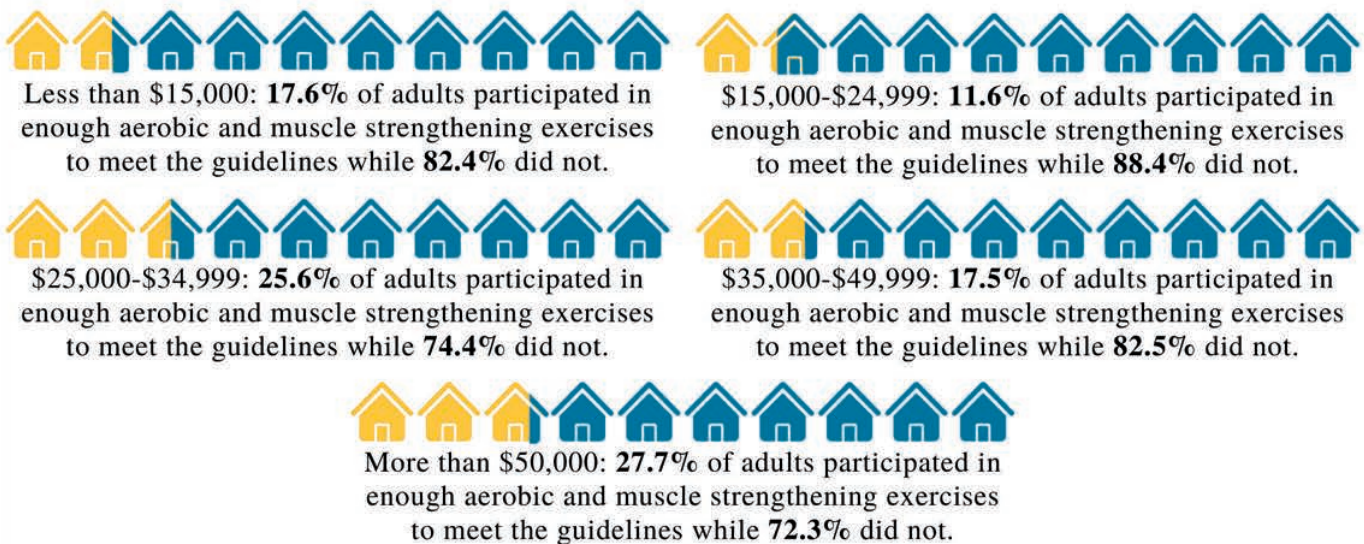


\*NHOPI - Native Hawai'ian or other Pacific Islander

**Figure 56. Percentage of respondents who met and did not meet the aerobic and muscle strengthening exercises guidelines by educational attainment (Guam: BRFSS 2019)**



**Figure 57. Percentage of respondents who met and did not meet the aerobic and muscle strengthening exercises guidelines by household income (Guam: BRFSS 2019)**



- Met the guidelines. - Did not meet the guidelines.

#### Potential Gaps:

- About 1/5 of the adult respondents in Guam participated in enough aerobic and muscle-strengthening activities to meet the guidelines (20.9%). Among the 4/5 of the respondents who did not meet the guidelines (79.1%), the lack of physical activity may be a risk factor for cancer.
  - The NCI listed seven cancers that have strong evidence linking a lower risk of developing those cancers with higher amounts of physical activity. Of the cancers listed, breast and colon cancers are ranked the leading cancers diagnosed in Guam. The lack of physical activity may be a contributing risk factor.
- The populations that had the lowest percentages to have met the guidelines include females, those between the ages of 55 to 64 years old, Hispanic individuals, those with less than a high-school education, and individuals with a household income between \$15,000 to \$24,999,
  - As the majority of Guam's population did not participate in enough aerobic and muscle strengthening exercises to meet the guidelines, physical activity should be promoted, especially to the populations that may be more vulnerable.

### PHYSICAL ACTIVITY (YOUTH)

The 2019 YRBS survey reported that **80.6%** (1,249) of Guam high school students were not physically active at least 60 minutes per day on five or more days during the seven days before the survey.

**Current situation:**

- Overall, about eight out of every ten Guam high school students surveyed (**80.6%**) were not physically active for at least 60 minutes on five or more days out of the seven days before the survey.
- *Gender:* Compared to male students (**62.7%**), a higher percentage of female students (**73.5%**) were not physically active for at least 60 minutes on five or more days (Figure 58).
  - This implies that more male students were physically active in comparison to female students.
- *Ethnicity:* Among the ethnic groups surveyed, NHOPI had the most students who reported not being physically active for at least 60 minutes on five or more days (**69.0%**). The percentage for this population was 1.4 times greater than students who identified as multiracial (**49.2%**) (Table 29).
  - One may infer that among the ethnic groups, NHOPI had the fewest students to report being physically active for at least 60 minutes on five or more days. In contrast, the multiracial group had the most students who were physically active for at least 60 minutes on five or more days.
- *Grade:* By grade level, students in 11th grade had the most students to report not being physically active for at least 60 minutes on five or more days (**70.8%**). In contrast, the 12th grade had the lowest percentage of students to report not being physically active for at least 60 minutes (**64.4%**) (Table 30).

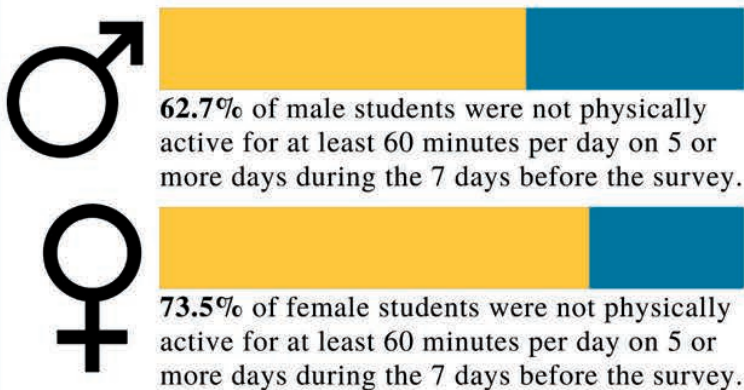
**Table 29. Percentage of respondents who were not physically active for at least 60 minutes per day on 5 or more days by ethnicity (Guam: YRBS 2019)**

Ethnic Group	Number of Cases	Percentage of Population
Asian	325	62.8%
Hispanic	127	67.2%
Native Hawai'ian or Other Pacific Islander (NHOPI)	581	69.0%
Multiracial	131	49.2%

**Table 30. Percentage of respondents who were not physically active for at least 60 minutes per day on 5 or more days by grade level (Guam: YRBS 2019)**

Grade Level	Number of Cases	Percentage of Population
Grade 9	527	65.7%
Grade 10	170	69.7%
Grade 11	230	70.7%
Grade 12	267	64.4%

**Figure 58. Percentage of respondents who were not physically active for at least 60 minutes per day on 5 or more days by gender (Guam: YRBS 2019)**



### PHYSICAL ACTIVITY (YOUTH) CONTINUED

**Potential Gaps:**

- Similar to Guam’s adult population, there is a lack of physical activity among Guam’s youth.
  - Physical education courses and extracurricular activities promoting physical activities should be examined. These programs may offer opportunities for youth to be physically active on a daily basis.
- Respondents who identified as NHOPI had the highest percentage (**69.0%**) of students not being physically active for at least 60 minutes on five or more days, students classified as having obesity (**26.2%**), and being overweight (**20.9%**). A lack of physical activity and high rates of youth classified as having obesity or being overweight may (**47.1%** combined) indicate that NHOPI youth are a vulnerable population.
  - NHOPI adults and youth should be a target population for programs that promote physical activity.
- The Hispanic population had the second highest percentage (**67.2%**) of students to report not being physically active for at least 60 minutes on five or more days. Similarly, among the adult population in Guam, Hispanic individuals had the lowest percentage of respondents to report that they participated in enough aerobic and muscle-strengthening activities to meet the guidelines (**13.2%**).
  - Similar to NHOPI, Hispanics should be a target population to promote physical activities through campaigns, extracurricular activities, etc.
- The tenth (**69.7%**) and eleventh (**70.7%**) grades had the highest percentages of students to report not being physically active for at least 60 minutes per day on five or more days.
  - Research may examine why students in these grade levels have the least amount of physical activity in their daily lives.
  - There are opportunities for Public Health, public and private clinics, and other health-oriented organizations to partner with Guam’s schools to conduct campaigns and events that promote physical activity for students, especially those in these grade levels.
  - School policies promoting physical activity should be examined and improved.



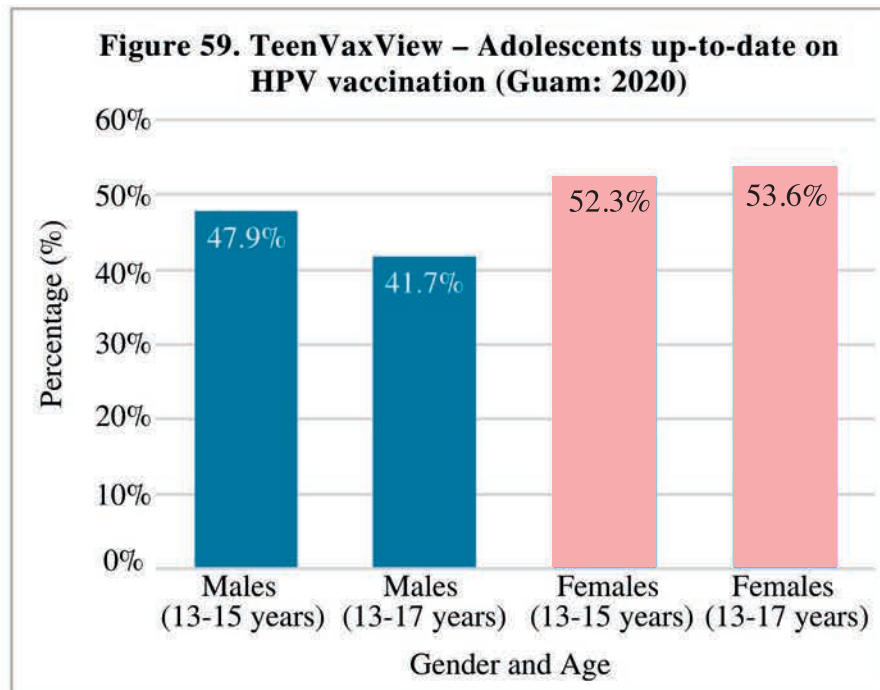


# HPV VACCINATIONS (YOUTH)

The National Cancer Institute describes human papillomavirus (HPV) as "a group of more than 200 related viruses, some of which are spread through vaginal, anal, or oral sex." HPV is the most common sexually transmitted disease. Both men and women can be infected with HPV.

High-risk HPVs are causally linked to several types of cancer including cervical, oropharyngeal, anal, penile, vaginal, and vulvar. HPV vaccination "can prevent infection with disease-causing HPV types, preventing many HPV-related cancers and cases of genital warts."

As reported by the CDC's TeenVaxView Program, male and female adolescents in Guam between 13 to 17 years old who were up-to-date on the HPV vaccination ranged from **41.7%** to **53.6%** (Figure 59). This data may indicate that only half of the age-eligible teens in Guam have received the recommended doses of the HPV vaccination.



Source: Centers for Disease Control and Prevention



### HPV vaccination recommendations:

- It is recommended that adolescents begin the HPV vaccination series at 11 or 12 years of age. The vaccination can begin as early as 9 years of age.
- The HPV vaccine is given as a series of
  - Two doses if the first dose is given before their 15th birthday.
  - Three doses if the series begins after their 15th birthday.
- Vaccination is not recommended for adults older than age 26 years.
  - Adults aged 27 to 54 may receive the HPV vaccination after consultation with their clinician.

**Table 31. Lifestyle risk factors: Summary of BRFSS results – highlighting groups with the highest and lowest percentages of respondents to have answered “yes” or met the criteria (Guam: 2020)**

	Tobacco Use – Current smokers	Tobacco Use – Smokeless Tobacco*	Alcohol consumption – at least 1 drink	Alcohol consumption – heavy drinking**	Health Care Coverage
<b>Gender</b>					
Male	24.7%	92.2%	53.7%	9.9%	77.8%
Female	15.2%	95.0%	28.6%	3.4%	80.8%
<b>Age</b>					
18 - 25	-	89.2%	41.2%	-	75.7%
25 - 34	17.3%	92.6%	50.4%	7.0%	75.8%
35 - 44	27.5%	94.6%	42.6%	5.9%	79.8%
45 - 54	23.5%	91.9%	42.9%	10.7%	81.3%
55 - 64	23.6%	97.2%	29.9%	4.2%	74.1%
65+	-	99.5%	33.0%	-	94.1%
<b>Ethnicity</b>					
White	11.0%	96.7%	63.7%	9.2%	95.2%
Asian	10.8%	98.9%	31.9%	-	75.9%
NHOPI	24.2%	87.1%	44.3%	7.4%	82.2%
Multiracial	27.7%	96.8%	41.9%	-	70.6%
Hispanic	22.2%	97.1%	39.5%	-	76.7%
<b>Educational Attainment</b>					
Less than H.S.	34.0%	90.0%	35.5%	-	71.6%
H.S. or G.E.D.	20.8%	91.9%	37.5%	8.2%	76.7%
Some Post-H.S.	13.9%	94.8%	44.2%	5.2%	81.5%
College Graduate	11.9%	98.3%	49.8%	5.5%	88.2%
<b>Household Income</b>					
Less than \$15,000	31.5%	87.4%	21.4%	-	63.4%
\$15,000 - \$24,999	19.9%	88.2%	35.2%	-	71.4%
\$25,000 - \$34,999	23.6%	94.4%	44.2%	-	85.6%
\$35,000 - \$49,999	14.0%	97.4%	45.4%	-	84.9%
More than \$50,000	16.2%	96.9%	52.4%	6.4%	92.5%

**Note:** Light blue highlights the lowest percentage, and light orange highlights the highest percentage among the population.

\*Data for Smokeless Tobacco Use is for respondents who answered "not at all" when asked if they currently use chewing tobacco, snuff, or snus.

\*\*The criteria for being defined as a heavy drinker is an adult man who has more than 14 drinks per week or an adult woman who have more than 7 drinks per week.

**Table 32. Lifestyle risk factors continued: Summary of BRFSS results – highlighting groups with the highest and lowest percentages of respondents to have met the criteria or guidelines (Guam: 2020)**

	Respondents classified as obese	Respondents classified as overweight	Respondents classified as normal weight	Physical Activity (met the guidelines)
<b>Gender</b>				
Male	33.8%	39.3%	25.7%	25.8%
Female	35.1%	25.4%	36.7%	16.0%
<b>Age</b>				
18 - 25	29.2%	31.1%	37.5%	27.0%
25 - 34	32.5%	32.8%	32.9%	20.3%
35 - 44	41.2%	31.0%	23.2%	20.9%
45 - 54	38.1%	35.7%	25.7%	18.5%
55 - 64	26.6%	32.2%	40.5%	17.3%
65+	35.6%	32.1%	30.9%	22.2%
<b>Ethnicity</b>				
White	22.9%	39.4%	34.8%	34.2%
Asian	18.6%	32.4%	47.1%	16.0%
NHOPI	48.4%	29.8%	21.3%	20.2%
Multiracial	36.0%	33.9%	29.3%	30.7%
Hispanic	35.7%	40.4%	22.9%	13.2%
<b>Educational Attainment</b>				
Less than H.S.	34.4%	29.8%	32.0%	12.8%
H.S. or G.E.D.	39.3%	29.7%	29.4%	22.8%
Some Post-H.S.	33.2%	35.3%	29.8%	23.5%
College Graduate	28.2%	36.8%	33.7%	23.4%
<b>Household Income</b>				
Less than \$15,000	32.6%	25.2%	40.3%	17.6%
\$15,000 - \$24,999	38.2%	29.6%	30.7%	11.6%
\$25,000 - \$34,999	41.9%	25.2%	25.9%	25.6%
\$35,000 - \$49,999	33.2%	37.6%	28.1%	17.5%
More than \$50,000	32.3%	38.1%	28.9%	27.7%

Note: Light blue highlights the lowest percentage, and light orange highlights the highest percentage among the population.

**Table 33. Lifestyle risk factors: Summary of YRBS results – highlighting groups with the highest and lowest percentages of respondents to have answered “yes” or met the criteria (Guam: 2019)**

	Tobacco Use – Smoked at least 1 cigarette in the last 30 days	Tobacco Use – Students who currently use EVP	Tobacco Use – Students who use EVP daily	Alcohol consumption – Had at least 1 alcoholic drink on at least 1 day in the past 30 days	Alcohol consumption – Bing Drinking*	Obese – Students classified as obese	Overweight – Students classified as overweight	Physical Activity – Students who were not physically active at least 60 minutes per day on 5 or more days
<b>Gender</b>								
Male	15.6%	38.6%	13.9%	28.4%	7.9%	25.8%	16.0%	62.7%
Female	7.7%	31.2%	7.8%	21.6%	8.6%	21.3%	21.1%	73.5%
<b>Grade Level</b>								
9th Grade	7.9%	25.8%	8.1%	14.9%	3.8%	24.5%	18.5%	65.7%
10th Grade	13.3%	32.5%	9.9%	22.4%	8.0%	18.8%	23.4%	69.7%
11th Grade	12.7%	48.9%	11.2%	32.7%	11.4%	28.0%	12.7%	70.7%
12th Grade	13.6%	36.6%	17.0%	36.1%	12.3%	24.4%	18.0%	64.4%
<b>Race</b>								
Asian	2.0%	14.9%	3.2%	11.8%	3.4%	17.4%	12.8%	62.8%
Hispanic	8.9%	N/A	N/A%	28.5%	11.0%	21.3%	11.0%	67.2%
NHOPI	15.3%	43.9%	14.4%	31.3%	10.3%	26.2%	20.9%	69.0%
Multiracial	6.3%	N/A	N/A%	14.6%	3.3%	16.6%	14.6%	49.2%

**Note:** Light blue highlights the lowest percentage, and light orange highlights the highest percentage among the population.

\*Binge drinking is defined as four or more drinks of alcohol in a row for female students or five or more drinks of alcohol in a row for male students within a couple of hours.

Screening Test	Screening Rates - Guam	Screening Rates - US
<b>Breast Cancer Screening</b>		
Mammogram within past 2 years [women aged 40 - 75]	59.4	71.5
Mammogram within past 2 years [women aged 50 - 75]	72.3	78.3
<b>Cervical Cancer Screening</b>		
Pap Test in past 3 years [women aged 21-65]	68.0	77.7
<b>Colorectal Cancer Screening</b>		
FOBT Blood stool test within past year [aged 50-75]	7.2	9.3
Sigmoidoscopy in past 5 years [aged 50-75]	*	1.9
Colonoscopy in past 10 years [aged 50-75]	37.5	64.3
Fully met USPSTF Guidelines [aged 50-75]	53.9	74.3
Never received any recommended CRC tests	41.2	18.2

\*Rate suppressed due to small sample size.

\*\*Note: Sigmoidoscopy and colonoscopy rates were only available for BRFSS 2018.

Source: BRFSS 2018 and 2020.

# DISCLAIMER

The credits, analyses, interpretations, or conclusions reached are those of the author(s), and not that of the Department of Public Health and Social Services, National Cancer Institute, or the U.S. Centers for Disease Control and Prevention.

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**GUAM**

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# NOTES

Handwriting practice lines consisting of 18 horizontal orange lines.

## PHOTO CREDITS

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  - Pg. iv - The Lone Sailor
- Vivian Pareja/ Guam Comprehensive Cancer Control Coalition
  - Pg. 1 - 2015 Cancer Education Conference
  - Pg. 8 - 2018 Colorectal Cancer Awareness Health Fair
  - Pg. 15 - 2016 Breast Cancer Awareness (Picture 1)
  - Pg. 17 - 2017 Cervical Cancer Conference
  - Pg. 35 - 2019 Colorectal Cancer Initiative (Picture 1)
  - Pg. 37 - 2019 Colorectal Cancer Initiative (Picture 2)
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