



Commonwealth Healthcare Corporation
Commonwealth of the
Northern Mariana Islands
**Non-Communicable
Disease & Risk Factor
ADULT HYBRID SURVEY**



2023

Endorsement



Commonwealth Healthcare Corporation

Commonwealth of the Northern Mariana Islands
1178 Hinemlu' St. Garapan, Saipan, MP 96950



October 11, 2024

Hafa Adai and Tirow,

Since 2016, the CNMI has experienced many environmental and social calamities. Events included Super typhoon Yutu, which left hundreds of CNMI families displaced or without homes, many of our school structures and campuses damaged, and communities on the islands of Saipan and Tinian without power and water for several months. The subsequent COVID-19 Pandemic exacerbated the situational trauma community members were already experiencing. Despite these significant crisis events, the CNMI remained resilient and thus we were able to conduct the 2023 Non-Communicable and Associated Risk Factors Hybrid Survey.

Non-Communicable Diseases, such as diabetes, hypertension, chronic kidney disease, cancer and heart disease continue to be the leading cause of death and diseases in the CNMI. Associated risk factors, such as obesity, food insecurity, lack of physical activity and tobacco use, continue to increase across our islands. However, we are fortunate to have data that can be used to compare to the results from the first time that the NCD Hybrid Survey was conducted in the CNMI in 2016. This data also allows us to perform comparisons against regional and national measures and indicators for the CNMI adult population.

I am grateful to the 2023 CNMI NCD Hybrid Survey team, stakeholders in the CNMI and regional, national and international partners in their efforts and the support they provided the CNMI in completing this survey. Their commitment and passion for improving the health and wellness of our pacific island populations are commendable.

This report provides the Commonwealth Healthcare Corporation (CHCC) and partners across all CNMI sectors, both public and private, with the information needed to support data informed decision making and effective policies that are essential for improving the health outcomes of all individuals and families that call the CNMI home.

We look forward to continued partnerships and collaborations for CNMI health.

A handwritten signature in blue ink that reads "Esther L. Muna".

Esther L. Muna, PhD, MHA, FACHE
Chief Executive Officer
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Summary

The purpose of this report is to assess the current prevalence of non-communicable diseases (NCDs) and selected risk factors for NCDs in the Commonwealth of the Northern Mariana Islands (CNMI). We hope that this report enables the CNMI to better understand its burden of these conditions and risk factors, monitor trends, and determine who is at greatest risk for poor health in order to improve health through the development of targeted evidence-based interventions.



NCDs such as heart disease, cancer, and diabetes are global issues that result in high burdens of disability and premature death [1]. Additionally, substance use and poor mental health can also greatly contribute to disability and premature death throughout the world [2]. NCDs, substance use, and poor mental health are highly linked to a number of key risk factors, such as cigarette smoking, tobacco chewing, excessive alcohol consumption, unhealthy diet, lack of physical activity, and overweight/obesity [1]. Over the past few decades there have been drastic changes in lifestyle among the people who reside in the CNMI, a commonwealth of the US located in the Pacific Ocean east of the Philippines. CNMI has shifted from mostly subsistence living and reliance on locally produced crops and fish to a more Western lifestyle that includes sedentary occupation and more reliance on imported foods. This lifestyle shift has resulted in higher burdens of certain risk factors, NCDs, and poor mental health [3].

The NCDs of concern in the US-Affiliated Pacific Islands (USAPIs) include diabetes, heart disease, stroke, cancer, and chronic obstructive pulmonary disease [1,2]. The social determinants of health demonstrate that there is a complex system of factors that are linked to NCDs which include demographic, social, technological, cultural, environmental, biological, economic, and political [4]. However, the four leading risk factors attributable to NCDs globally include unhealthy diets (insufficient consumption of fruit and vegetables, excessive consumption of salt, high fat, and high sugar foods), insufficient physical activity, excessive consumption of alcohol, obesity, and tobacco use [2]. In the Pacific Islands, betel nut (which is carcinogenic to humans) chewing with or without tobacco is also identified as a significant health problem [5].

In the CNMI, the first Hybrid Survey was conducted in 2016. This survey provided baseline data on NCD risk factors and disease prevalence. The Hybrid Survey is planned every 5 years in the CNMI, however, the survey was delayed due to the COVID-19 pandemic and subsequently conducted in 2023.

In 2023, a total of 1,770 individuals aged 18 years or older participated in the survey. Respondents answered questions about their alcohol and tobacco use, other substance use, dietary habits, physical activity, health access, oral health, health conditions, mental health, and cancer screening. Additionally, height and weight, Hemoglobin A1C, and blood pressure were measured.

CNMI vs. USA

The table below illustrates select prevalence data from the 2023 CNMI Hybrid Survey compared to the US using the most comparable sources available. The CNMI has higher prevalence rates for the select indicators identified below with a red arrow compared to the US. Alcohol use in the past 30 days was lower in the CNMI compared to the US, though the binge drinking prevalence was higher in the CNMI. The overweight/obesity prevalence is similar in both locations, though the prevalence of diabetes and hypertension in CNMI is higher than the US. Due to lack of raw data from US sources, statistical analysis could not be performed.

Table 1. Selected NCD indicators in the CNMI compared to the US

Selected NCD Indicators	CNMI %	US %	COMPARISON
Current tobacco use (past 30 days)			
Cigarette smoking	21.4	14.4	↑
E-cigarette use	10.0	6.7	↑
Current alcohol use (past 30 days)			
Alcohol use (any)	42.5	53.3	↓
Binge drinking (5+ drinks per day)	28.2	15.4	↑
Nutrition			
Consuming fruit <1 time per day	69.9	40.8	↑
Consuming vegetables <1 time per day	54.4	19.7	↑
Health and healthcare			
Fair and poor health (self-reported)	43.0	14.8	↑
No medical checkup in the past	35.7	24.4	↑
Oral health			
No dental visit within past year	52.5	33.3 ¹	↑
Extracted permanent teeth due to decay/disease	57.7	40.2 ¹	↑
Chronic conditions			
Overweight/obesity	72.0	73.1 ²	○
Diabetes (self-reported + undiagnosed)	26.8	14.3 ³	↑
** Hypertension (self-reported + undiagnosed)**	47.0	31.7 ⁴	↑
Cancer screening			
No dental visit within past year	44.9	22.3 ¹	↑
Extracted permanent teeth due to decay/disease	56.8	21.7 ¹	↑

Source for US comparison: BRFSS 2021 unless noted with ¹BRFSS 2020, ²NHANES 2017-2018 (adults 20+), ³CDC National Diabetes Report 2022 (includes diagnosed and undiagnosed diabetes) ⁴NHANES 2017-2018 (adults 18+; includes diagnosed and undiagnosed hypertension), **Diabetes prevalence is estimated based on either a self-report of diabetes for which the patient is taking medication and/or an A1c of ≥6.5% during the survey; Hypertension prevalence is estimated based on either a self-report of hypertension for which the patient is taking medication and/or a measured average blood pressure (of 2 readings) of ≥140/90.

Surveillance in CNMI: 2016 vs. 2023

The table below compares the 2016 CNMI Hybrid Survey results to the 2023 CNMI Hybrid Survey. Chi-square analysis ($p < 0.05$ considered statistically significant) was used for comparisons with red indicating a worsening trend, green indicating an improving trend, and yellow indicating no significant change.

Table 2. Selected NCD indicators for surveillance in the CNMI 2016 compared to 2023

Selected NCD Indicators	2016 %	2023 %	COMPARISON
Current tobacco use			
Cigarette smoking in the past 30 days	25.2	21.4	↓
Chewing betel nut with tobacco in the past 30 days	16.7	22.5	↑
E-cigarette use ¹	2.0	10.0	↑
Current alcohol use			
Alcohol use in the past 30 days	45.9	42.5	○
Binge drinking in the past 30 days	23.0	28.2	↑
Nutrition			
<5 servings of fruits and vegetables per day	75.4	87.9	↑
Health and Healthcare			
Self-reported fair or poor health	42.3	43.0	○
Medical check-up in the past year	35.7	64.3	↑
Has healthcare coverage	53.9	67.4	↑
Avoided medical care due to cost	15.7	13.0	↓
Oral health			
Dental visit within the past year	27.0	47.5	↑
Any permanent teeth extracted due to decay/disease	65.4	57.7	↓
Cancer Screening			
Up-to-date Pap (women 21-65) ²	43.2	55.1	↑
Up-to-date Mammogram (women 50-74) ³	31.4	43.2	↑
Chronic conditions			
Overweight/obesity ⁴	63.9	72.0	↑
Diabetes ⁵	18.7	26.8	↑
Hypertension ⁶	56.0	47.0	↓

¹data from 2016 CBHS survey that includes individuals 15 and older

²2016 up-to-date is a Pap within the past 2 years, and in 2023 it was Pap within the past 3 years due to changes in screening guidelines

³For both 2016 and 2023, an up-to-date mammogram is a mammogram within the past 2 years

⁴Overweight/obesity determined as a BMI ≥ 25 based on measured height and weight

⁵2016: diabetes was determined by a self-report of medicated diabetes and/or a random blood sugar of $> 140\text{mg/dL}$; 2023: diabetes was determined by a self-report of medicated diabetes and/or an A1c of $\geq 6.5\%$

⁶Hypertension was determined by a self-report of medicated hypertension and/or an average blood pressure reading (out of 2 readings) of $\geq 140/90$

Introduction

Non-communicable diseases (NCDs) are the leading causes of morbidity and mortality for adults in the United States Affiliated Pacific Islands (USAPIs) (American Samoa, Guam, Commonwealth of the Northern Mariana Islands [CNMI], Federated States of Micronesia [FSM], Republic of Palau, and Republic of Marshall Islands [RMI]) [5].

On May 25, 2010 the Pacific Island Health Officers Association (PIHOA) declared a Regional State of Health Emergency due to the epidemic of non-communicable diseases in the USAPIs as NCDs were attributing to roughly 70-75% of all deaths in the region [1]. The NCDs of concern in the USAPIs include diabetes, heart disease, stroke, cancer, and chronic obstructive pulmonary disease [1,2]. Risk factors for developing NCDs within these island jurisdictions are among the highest in the world. This includes tobacco use, poor diet, sedentary lifestyles, and binge drinking [1]. In most of the USAPIs, betel nut (which is carcinogenic to humans) chewing with or without tobacco is also identified as a significant health problem [6].

Although support partners such as Centers for Disease Control and Prevention (CDC), Substance Abuse and Mental Health Services Administration (SAMHSA), and the World Health Organization (WHO) have standardized surveillance systems, they are not always the best fit for the CNMI or the other USAPIs. The CNMI is a small island jurisdiction that lacks the resources to maintain multiple NCD surveillance systems. To address its population health data needs, the CNMI shifted to a “hybrid approach” in which key indicators from multiple support partner surveillance systems are integrated into one survey, and multiple partners contribute financially and through technical support to conduct the “hybrid” survey [7].

To conduct the survey, the CNMI CHCC contracted data collection and received technical support primarily from PIHOA. Other technical support was provided by CDC, the Pacific Community, and the WHO.



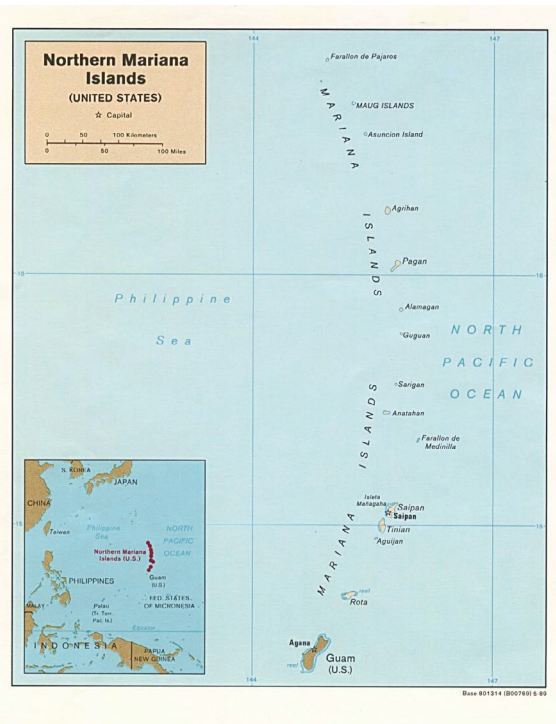


The Commonwealth of the Northern Mariana Islands (CNMI) is a chain of fourteen islands, located in the northwestern region of the Pacific Ocean. A commonwealth of the United States of America since 1978, the CNMI follows U.S. governance and systems, in addition to its own established constitution, legislative body, and laws [8].

Of the 14 islands, the majority of the inhabitants reside on three of the islands: Saipan, Tinian, and Rota. According to the 2020 Census, the CNMI has a population of about 47,329 [9]. Saipan, the CNMI's capital, is the most populous island inhabiting 43,385 people, while Tinian and Rota inhabit about 2,000 people each.

Among the population of the CNMI, 71.2% are adults 18 and older. Among adults 25 and older, 85.6% have attained at least a high school degree, and 21.0% have attained a bachelor's degree or higher.

The CNMI is home to a diverse group of races and ethnicities. Close to half (46.6%) of the population in the CNMI is Asian, with Filipinos (32.7% of the total population) making up the majority of this group. The second largest ethnic group is Pacific Islander, making up 43.7% of the population. The largest group among Pacific Islanders are indigenous Chamorros (25.4% of the total population), followed by indigenous Carolinians (4.8% of the total population).



Survey Methodology

The CNMI Hybrid Survey aimed to assess NCD risk factors such as nutrition, physical activity levels, tobacco use, alcohol use, other substance use, mental health, healthcare utilization, oral health, and cancer screening rates. The CNMI Hybrid Survey collected physical measurement of height, weight, blood pressure, and biochemical measurement of hemoglobin A1C.

The CNMI Hybrid survey includes questions from validated instruments such as the CDC Behavioral Risk Factor Surveillance System (BRFSS), WHO STEPwise approach to Surveillance (STEPS), CDC National Health and Nutrition Examination Survey (NHANES), SAMHSA National Outcomes Measures (NOMs), as well as locally developed questions.

Objectives

1. Inform the community on NCD and risk factor prevalence in the CNMI.
2. Use these data to evaluate current efforts and the effectiveness of implemented interventions in decreasing risk factors and the prevalence of NCDs.
3. Support further research on NCD risk and protective factors in the CNMI.
4. To direct policy and program strategies to reduce NCDs in the CNMI.

Target Group

- Participants eligible for the CNMI Hybrid survey included all CNMI residents aged 18 years and over who were able to provide consent.



Sampling Procedures



Multi-stage sampling was used to recruit participants in this survey. This procedure is described in detail below

Stage 1: Geographical Stratification and Household Sampling.

Saipan, Tinian, and Rota were stratified based on adult population size on these islands based on most recent estimates from the 2020 Census (sample size= 1,946 Saipan, 93 Tinian, 86 Rota). Saipan was further stratified according to population size by district. Tinian and Rota were further stratified according to population size by village. Individual households were then randomly selected from active residential meter listings provided by the Commonwealth Utilities Corporation. Households were located using GPS coordinates and verified by meter number.

Stage 2: Selection of the individual from the household for the Hybrid survey.

Kish methodology was used for random selection of one adult per selected household.

Step 1: Ask for the age and sex of all adults living the household (exclude those visiting who do not live in the household, those who are off-island long-term, and those who would be unable to provide consent).

Step 2: Rank all adults based on age and sex.

Step 3: Use Kish grid to identify selected participant based on rank.

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Data Collection



Data were collected by trained surveyors contracted by Turn Key Solutions LLC. All surveyors underwent an extensive one-week training. Interviews were conducted in English in the home on the day of the home visit, followed by collection of physical (height, weight, blood pressure) and biochemical (HbA1C) measurements. Data were collected from February to May 2023.

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Data Entry



All data were collected electronically on a tablet using the Open Data Kit (ODK) Collect app. Tablets were uploaded on a weekly basis to the PIHOA Ona account.

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Data Cleaning



Descriptive statistics were produced for all variables. Outliers were also checked, validated, and rectified.

A data dictionary was created to explain the indicators and data codes.

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Data Analysis



Descriptive data analysis was conducted. Chi-squared analysis was used to analyzed differences by:

- **Age group** (18-24 years old, 25-34 yo, 35-44 yo, 55-64 yo, 65+ yo)
- **Gender** (Male, Female)
- **Island** (Saipan, Tinian, Rota)
- **Education** (Less than high school education, completed high school education, more than high school education)
- **Ethnicity** (Chamorro, Carolinian, Other Pacific Islander, Filipino, Other)

Sample Summary

The sample collected was comparable to population estimates based on the 2020 Census, though the sample had a higher proportion of females and older age groups, most likely due to higher rates of refusals among males and younger age groups.

Table 3. Survey sample compared to 2020 census data in the CNMI

	Survey sample n=1,770	2020 Census data (18 and older) n=33,709
Gender		
Male	843 (47.6%)	17,765 (52.7)
Female	927 (52.4%)	15,944 (47.3)
Age Group		
18-24 years	166 (9.4%)	4,234 (12.6)
25-34 years	294 (16.6%)	6,138 (18.2)
35-44 years	294 (16.6%)	6,596 (19.6)
45-54 years	385 (21.8%)	8,086 (24.0)
55-64 years	380 (21.5%)	5,863 (17.4)
65+ years	251 (14.2%)	2,792 (8.3)
Island (Total Population)*		
Saipan	1,619 (91.5%)	43,385 (91.8%)
Tinian	79 (4.5%)	2,044 (4.3%)
Rota	72 (4.1%)	1,843 (3.9%)
*7 people reside in the Northern Islands municipality		

Demographics

Table 4. Demographic data in the CNMI

Genders	n	%	Employment Status	n	%
Male	843	47.6	Employed for wages	860	48.8
Female	927	52.4	Self-employed	108	6.1
			Out of work, looking	232	13.2
			Out of work, not looking	168	9.5
			Homemaker	142	8.0
			Retired	164	9.3
			Unable to work	90	5.1
Education			Household Income	n	%
Less than 9th grade	54	3.1	\$0-\$16,000	579	42.5
Some high school	132	7.5	\$16,001-\$20,000	163	12.0
High school diploma or equivalent (GED)	868	49.1	\$20,001-\$24,000	107	7.9
Some college / AA degree	449	25.4	\$24,001-\$28,000	83	6.1
Bachelor's degree	229	13.0	\$28,001-\$32,000	84	6.2
Post-graduate degree	35	2.0	\$32,001-\$40,000	77	5.6
			\$40,001-\$48,000	61	4.5
			\$48,001-\$56,000	59	4.3
			\$56,001-\$64,000	33	2.4
			\$64,001-\$72,000	31	2.3
			\$72,001-\$85,000	28	2.1
			\$85,000 or more	58	4.3
Ethnic Background					
Chamorro	584	33.0			
Carolinian	140	7.9			
Chamorro/Carolinian	23	1.3			
FSM Micronesian	94	5.3			
Palauan	48	2.7			
Other Pacific Islander	32	1.8			
Filipino	652	36.9			
Chinese	47	2.7			
Bangladeshi	29	1.6			
Other Asian	45	2.5			
Caucasian	29	1.6			
Mixed race	23	1.3			
Other	22	1.2			
Citizenship					
US Citizen	1120	63.6			
US National	54	3.1			
Other Citizenship	587	33.3			
Marital Status					
Now married	855	48.4			
Not married but in a domestic partnership	227	12.8			
Separated	35	2.0			
Widowed	133	7.5			
Divorced	66	3.7			
Never Married	451	25.5			

NOTE: some Ns may not total 1,770 due to responses of "don't know" or "refused"

General Health

More than 2 out of 5 adults (43.0%) in the CNMI self-reported their health as fair or poor. Fair or poor health was significantly higher among younger adults, women, those with a high school education or less, and Chamorro, Carolinian, and other Pacific Islander populations.

Figure 1. Self-reported health status among adults in the CNMI, 2023

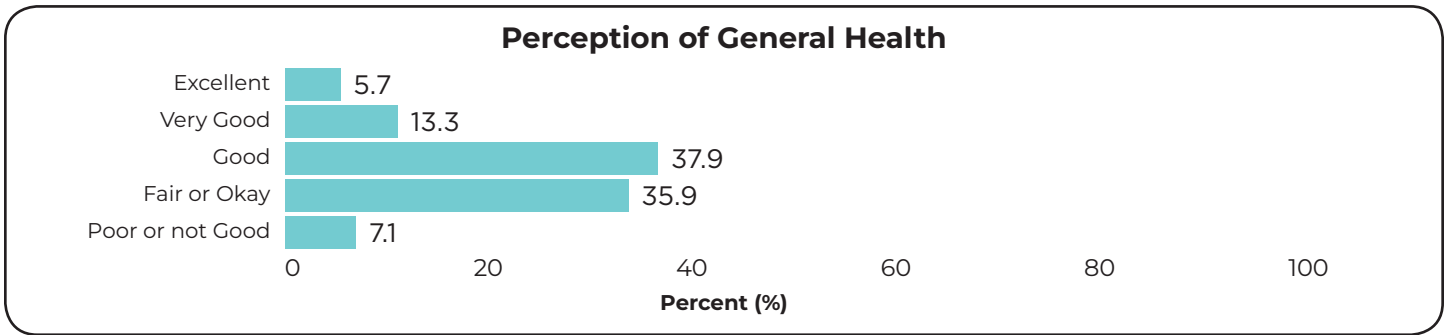


Figure 2. Percentage of Adults who have reported Fair/Poor Health, by Ethnicity in the CNMI, 2023

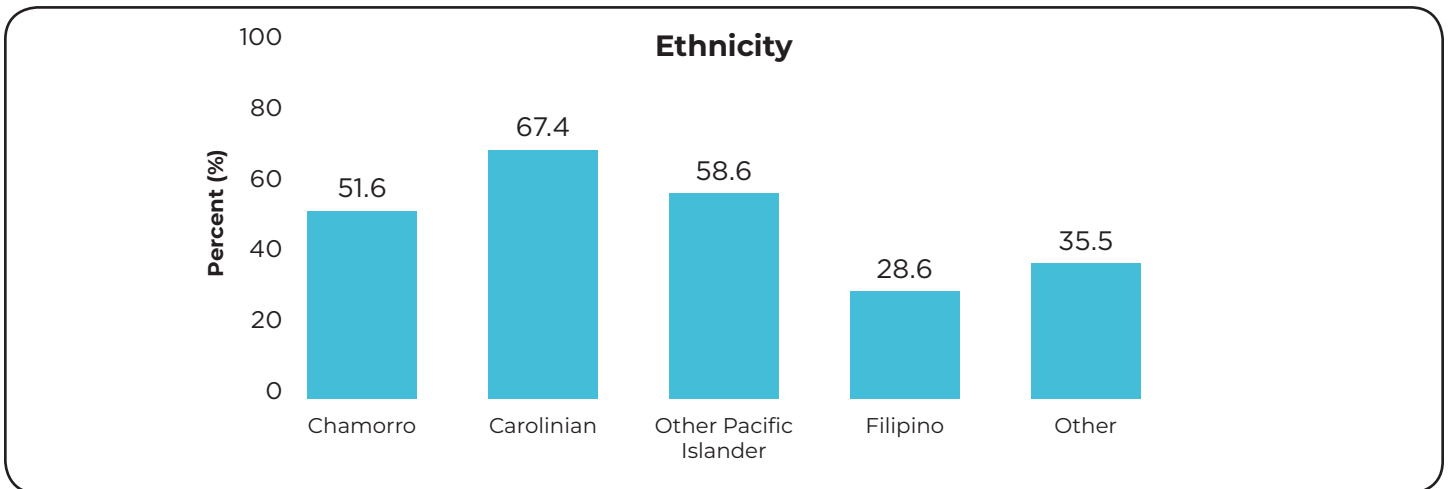
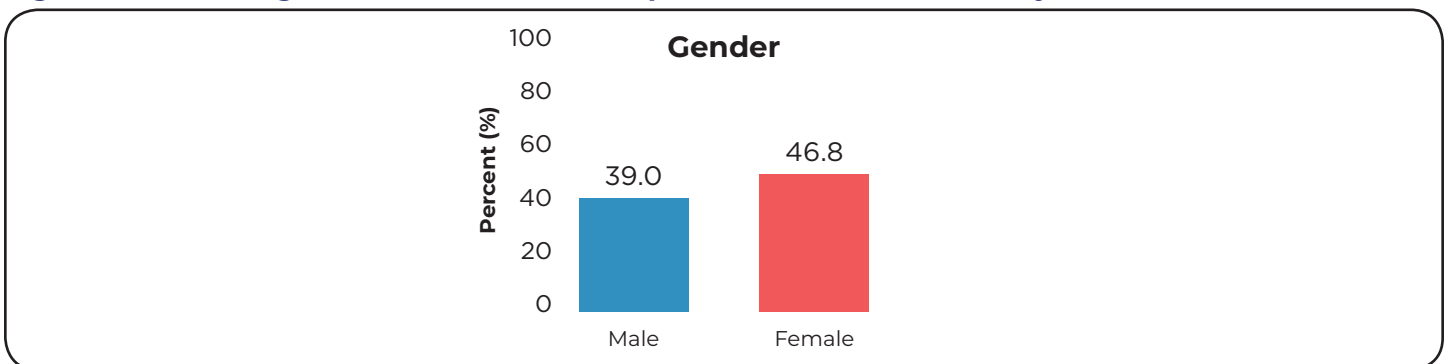


Figure 3. Percentage of Adults who have reported Fair/Poor Health, by Gender in the CNMI, 2023



General Health

Figure 4. Percentage of Adults who have reported Fair/Poor Health, by Age in the CNMI, 2023

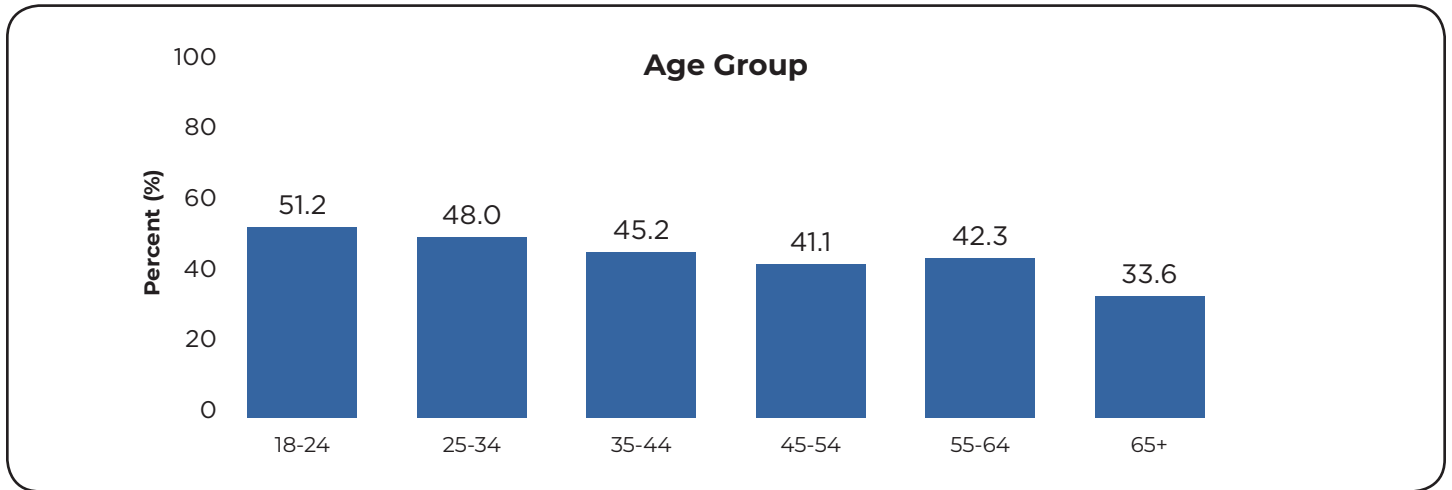


Figure 5. Percentage of Adults who have reported Fair/Poor Health, by Education in the CNMI, 2023

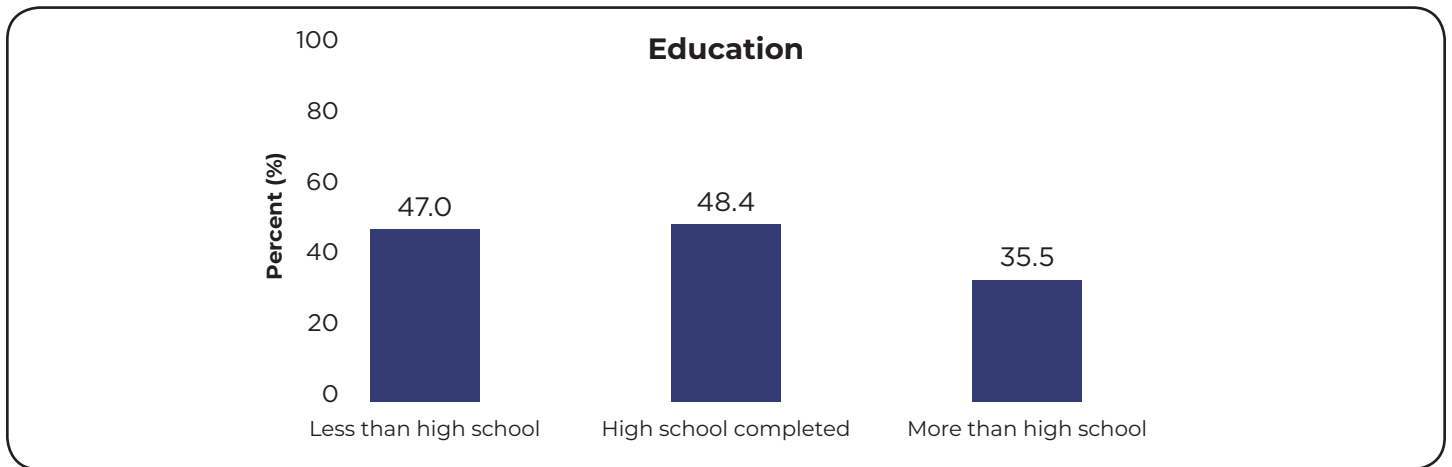
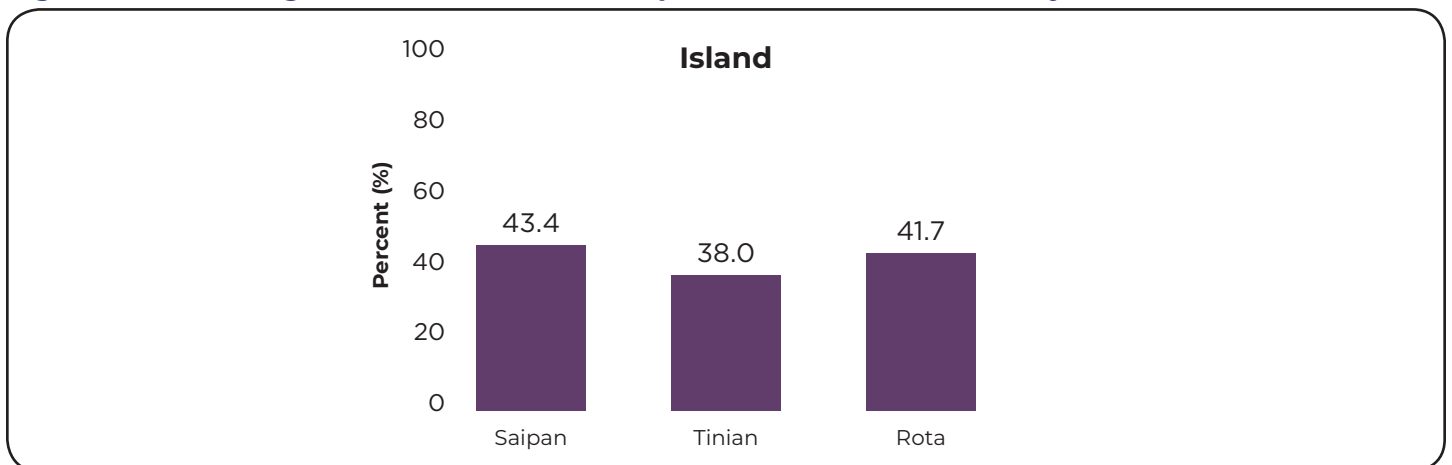


Figure 6. Percentage of Adults who have reported Fair/Poor Health, by Island in the CNMI, 2023



Access to Care: Annual Checkup

About 2 out of 3 adults (64.3%; 95%CI: 61.9%-66.5%) in the CNMI had an annual exam in the past year. 7.9% have never had an annual exam. Men, younger adults (<45yo), those with a high school education or less, those residing in Tinian and Rota, and Chamorro, Carolinian, and other Pacific Islander populations were significantly more likely to NOT have had an annual exam.

Figure 7. Last annual exam among adults in the CNMI, 2023

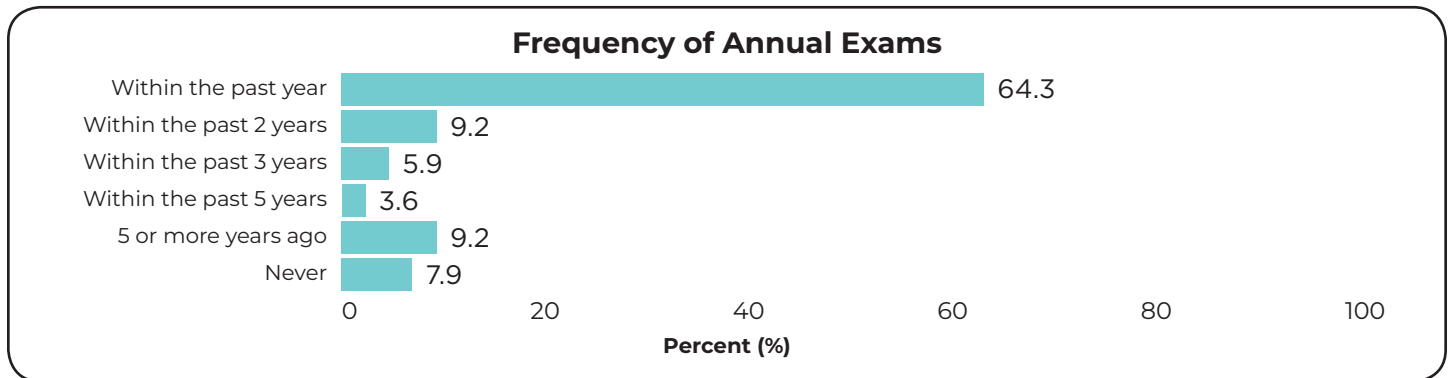


Figure 8. Percentage of Adults with NO annual exam, by Ethnicity in the CNMI, 2023

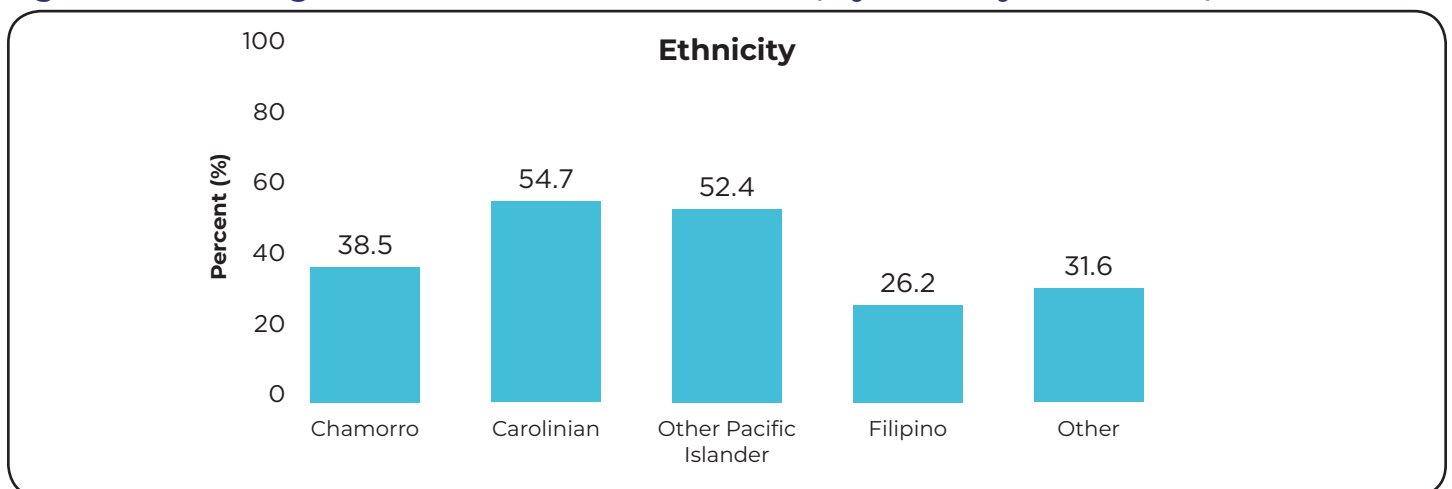
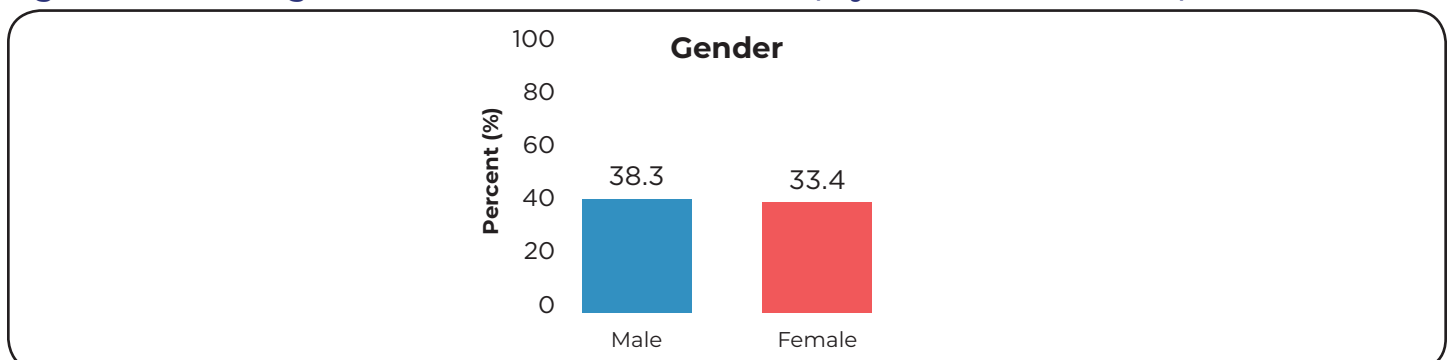


Figure 9. Percentage of Adults with NO annual exam, by Gender in the CNMI, 2023



Access to Care: Annual Checkup

Figure 10. Percentage of Adults with NO annual exam, by Age in the CNMI, 2023

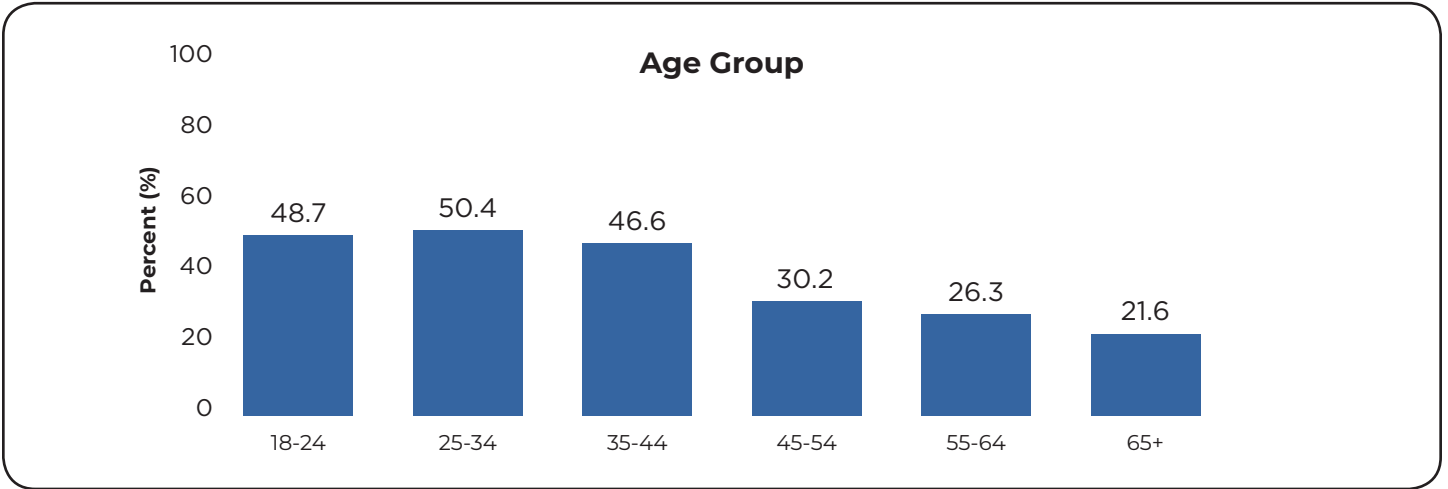


Figure 11. Percentage of Adults with NO annual exam, by Education in the CNMI, 2023

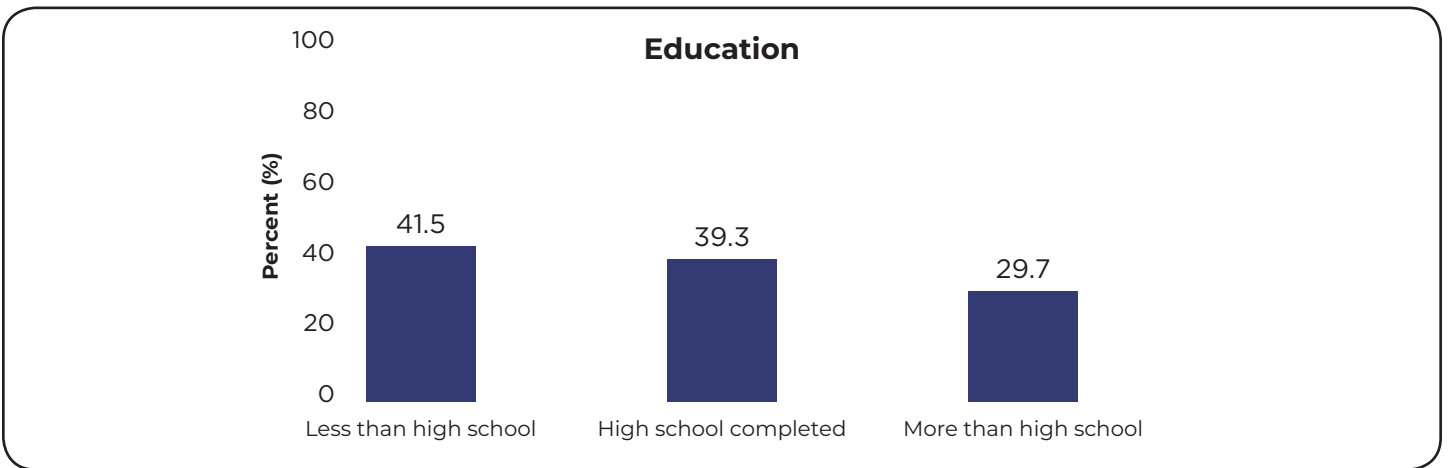
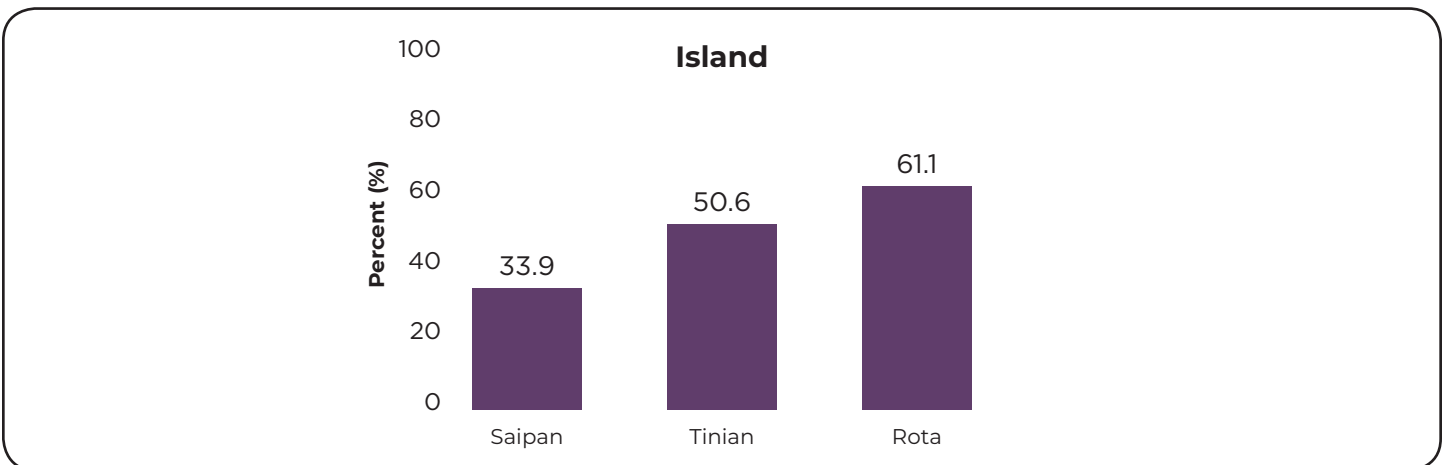


Figure 12. Percentage of Adults with NO annual exam, by Island in the CNMI, 2023



Access to Care: Health Insurance

About 2 out of 3 adults (67.4%; 95% CI: 65.1%-69.6%) in the CNMI reported that they have health insurance. The majority of adults with health insurance use Medicare or Medicaid (63.1%). Being uninsured was significantly higher among men, those aged 45-64 years old, those residing in Saipan, and Filipino, Other and Other Pacific Islander communities.

Figure 13. Percentage of Adults with NO health insurance, by Ethnicity in the CNMI, 2023

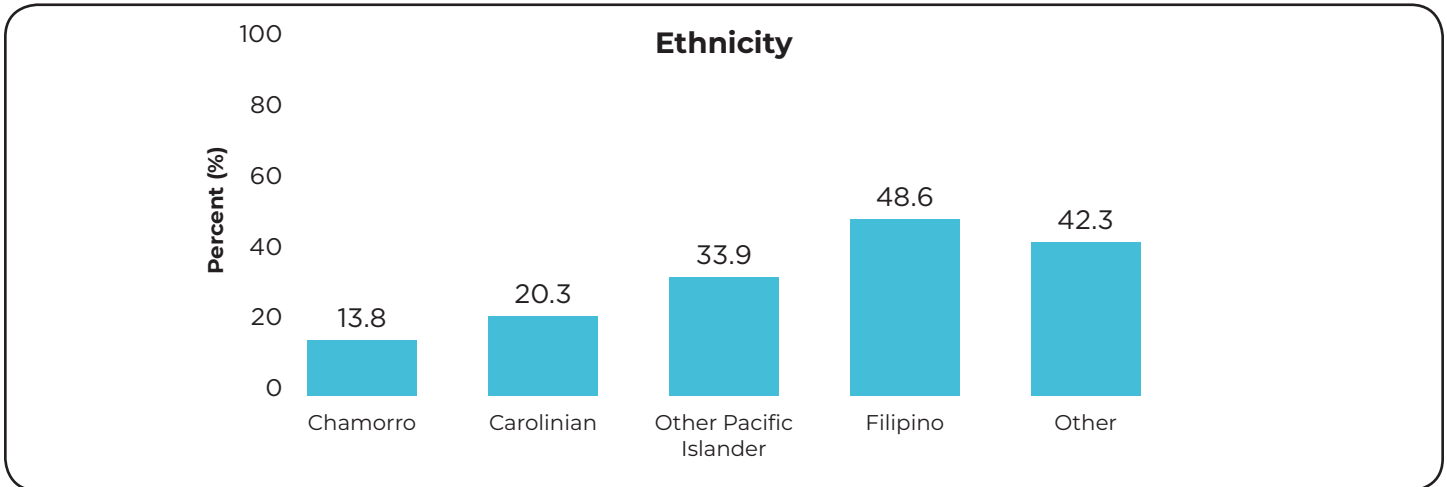


Figure 14. Percentage of Adults with NO health insurance, by Gender in the CNMI, 2023

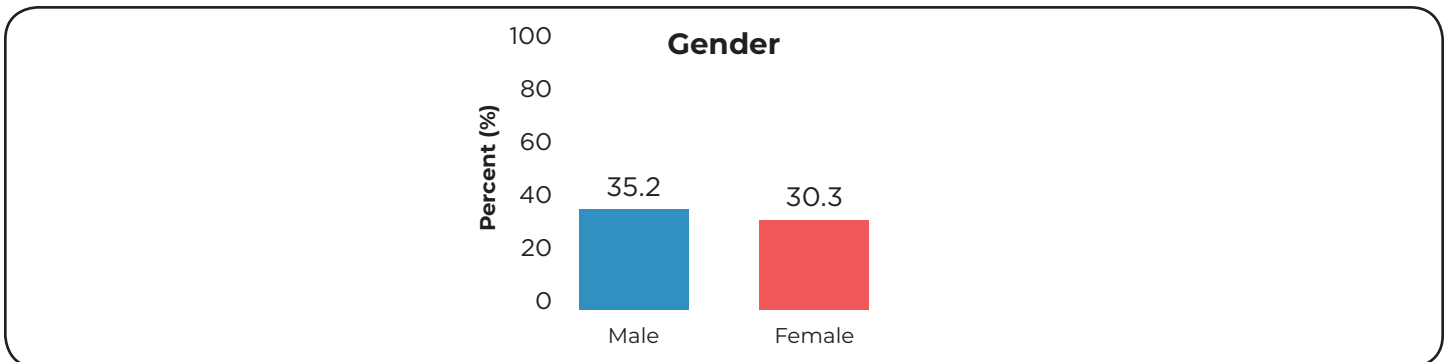
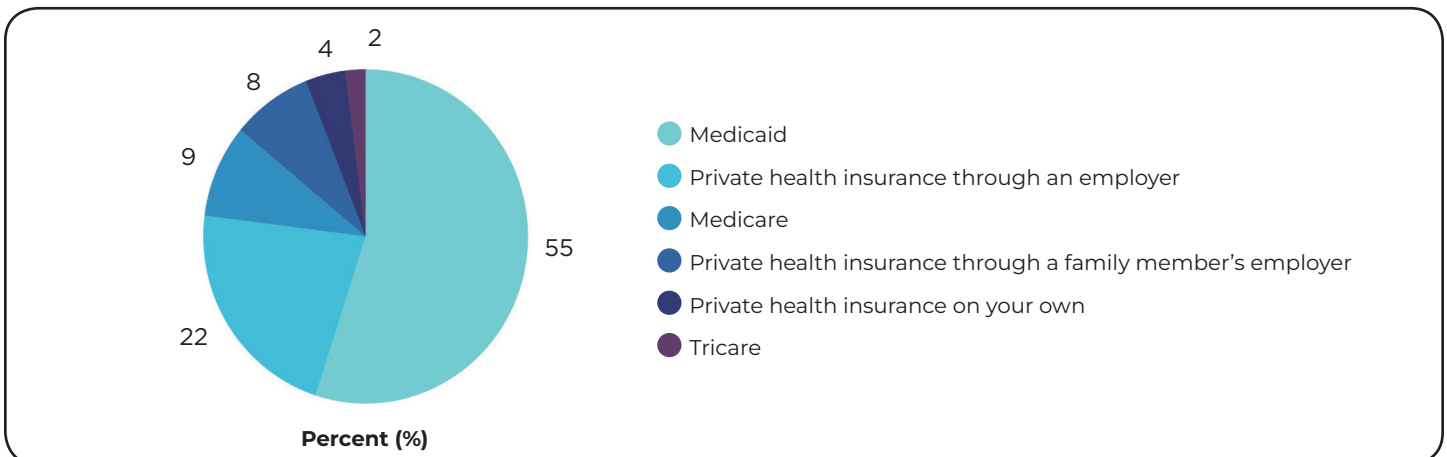


Figure 15. Health Insurance Type in the CNMI, 2023



Access to Care: Health Insurance

Figure 16. Percentage of Adults with NO health insurance, by Age in the CNMI, 2023

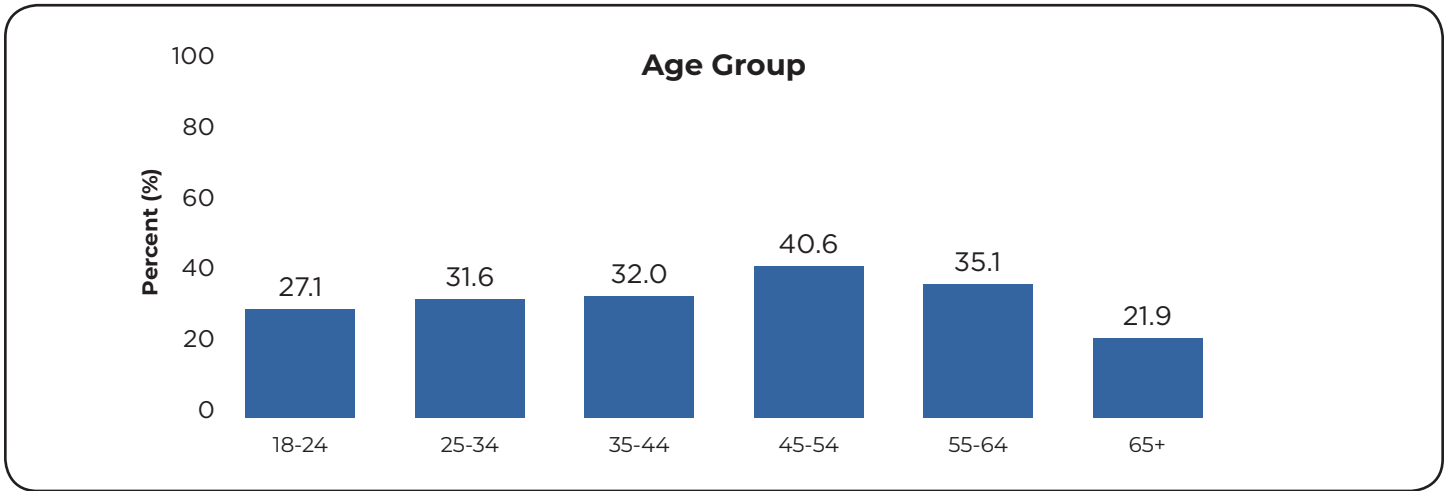


Figure 17. Percentage of Adults with NO health insurance, by Education in the CNMI, 2023

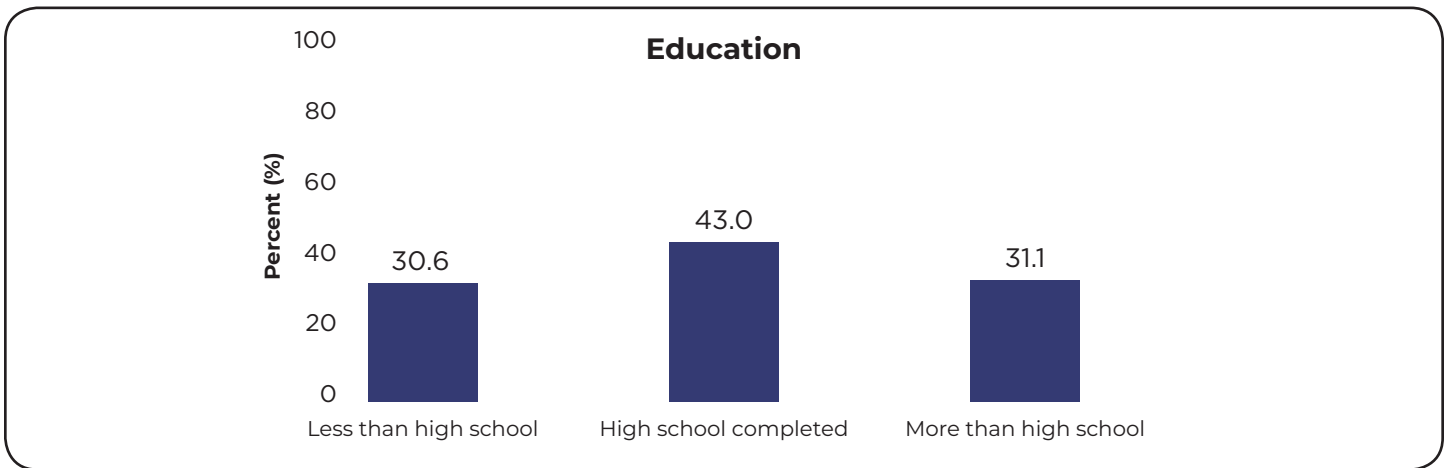
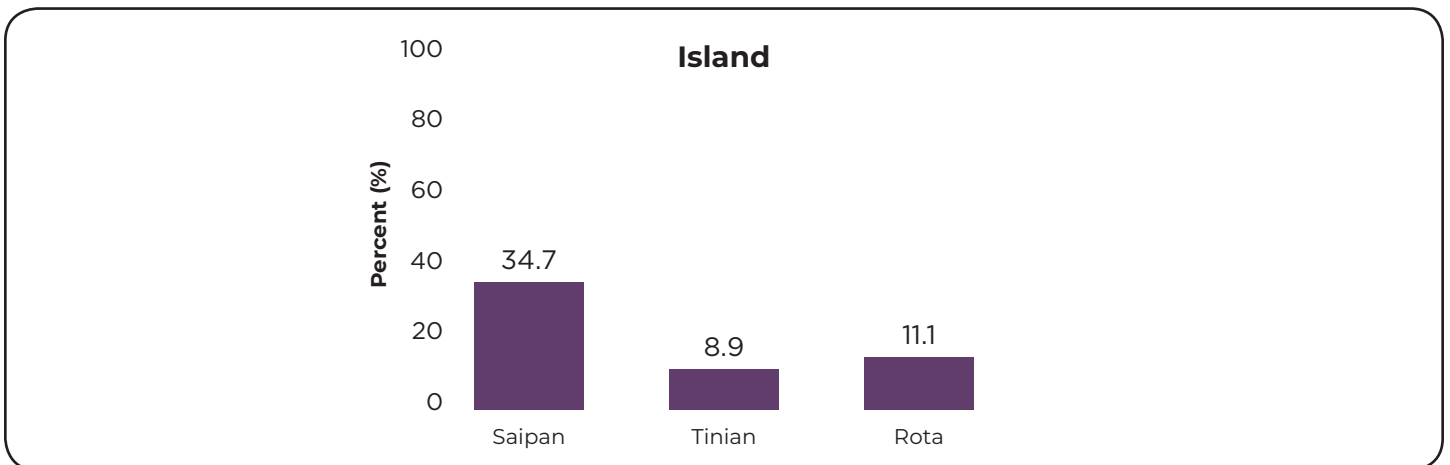


Figure 18. Percentage of Adults with NO health insurance, by Island in the CNMI, 2023



Access to Care: Health Care Barriers

In the past 12 months, about 1 out of 5 (19.9%) of adults in the CNMI could not access health care because of cost, lack of transportation, or lack of childcare.

Table 5. Perception of Health Care Barriers among adults in the CNMI, 2023

Couldn't get care in the past 12 months because of cost	13.0%
Couldn't get care in the past 12 months because of lack of transportation	9.3%
Couldn't get care in the past 12 months because of lack of childcare	4.6%
Couldn't get care in the past 12 months because of cost, lack of transportation, and/or lack of childcare	19.9%

Challenges with access to health care were significantly higher among those aged 35-54 years old, women, those with lower education levels, and Carolinian, Other Pacific Islander, and Other ethnicity populations.

Figure 19. Percentage of Adults who Couldn't get care in the past year, by Ethnicity in the CNMI, 2023

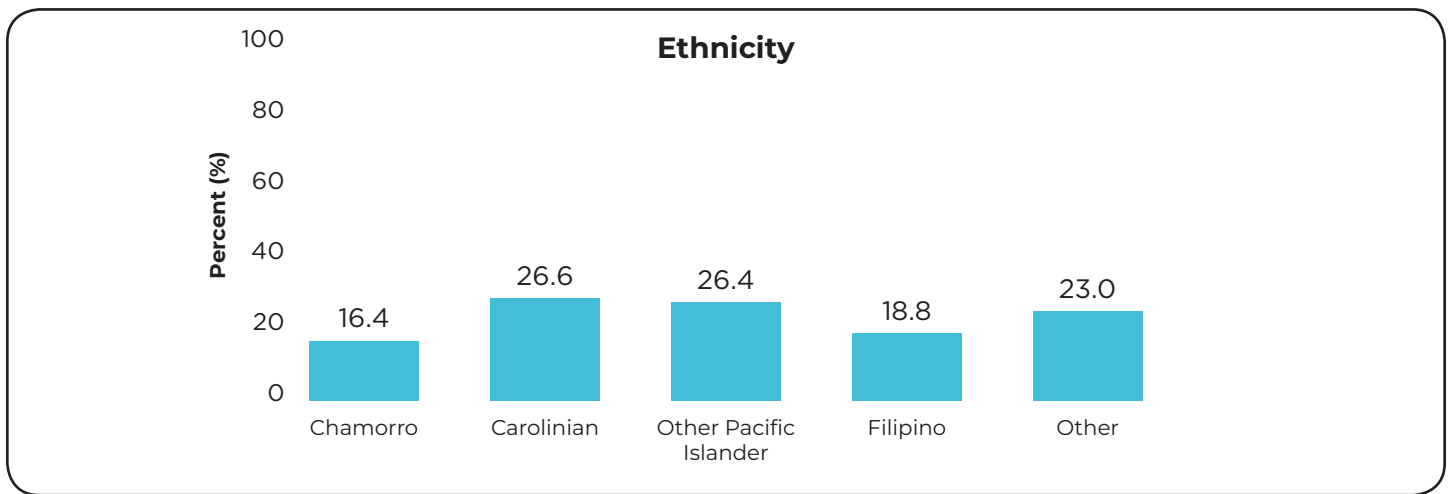
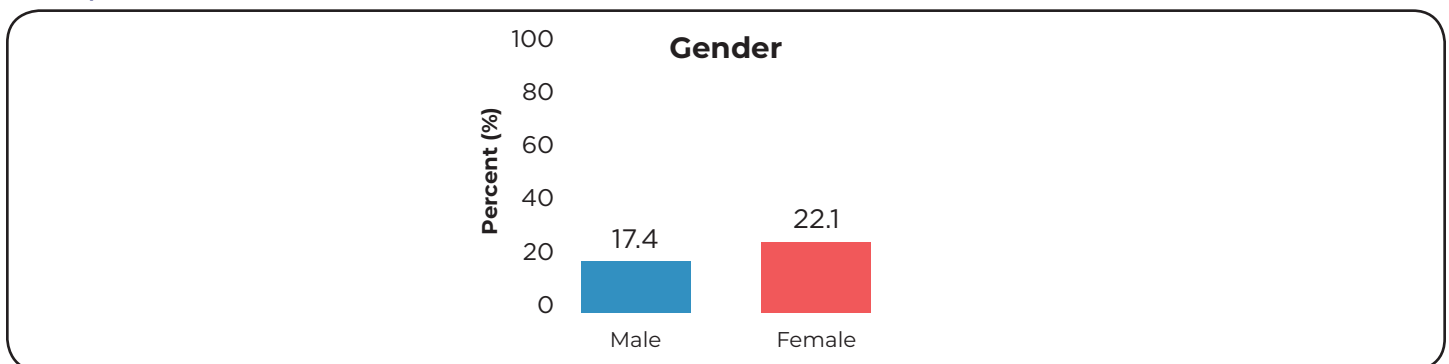


Figure 20. Percentage of Adults who Couldn't get care in the past year, by Gender in the CNMI, 2023



Access to Care: Health Care Barriers

Figure 21. Percentage of Adults who Couldn't get care in the past year, by Age in the CNMI, 2023

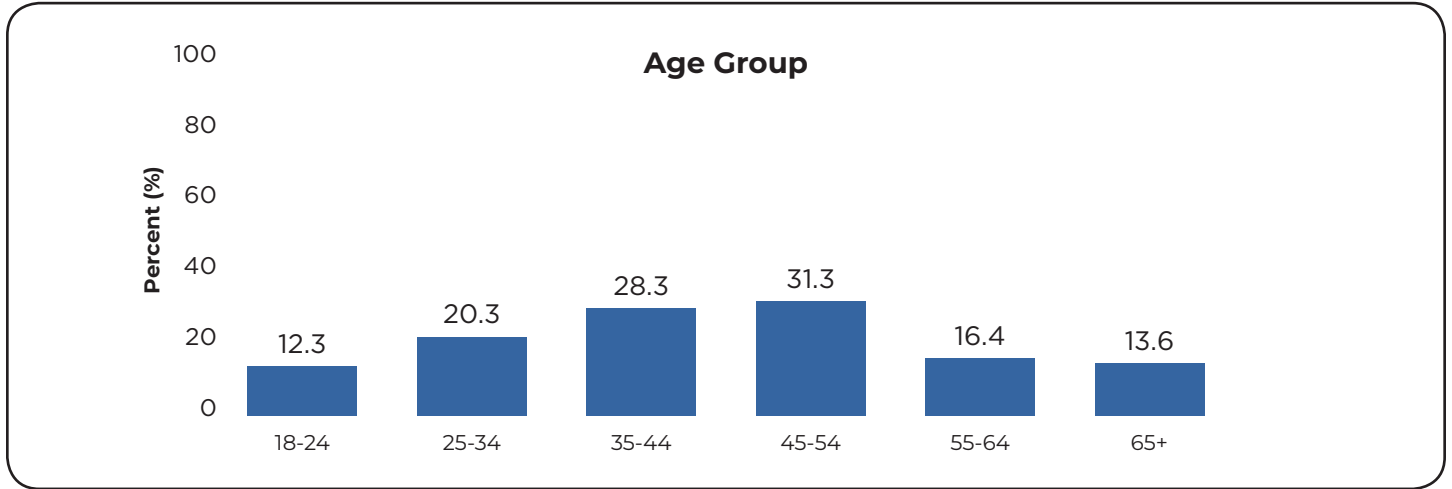


Figure 22. Percentage of Adults who Couldn't get care in the past year, by Education in the CNMI, 2023

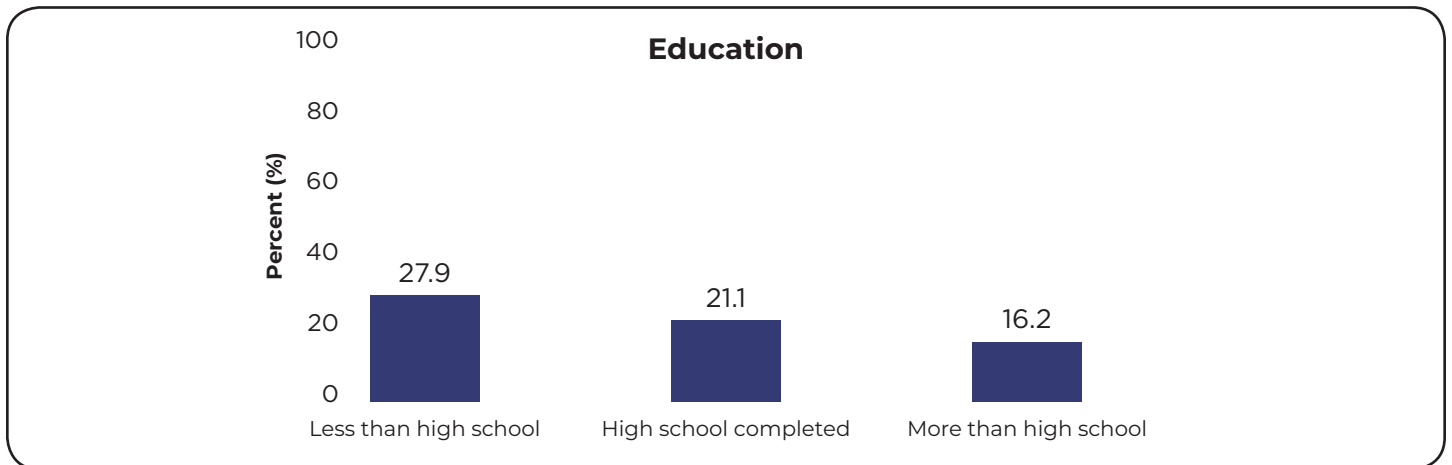
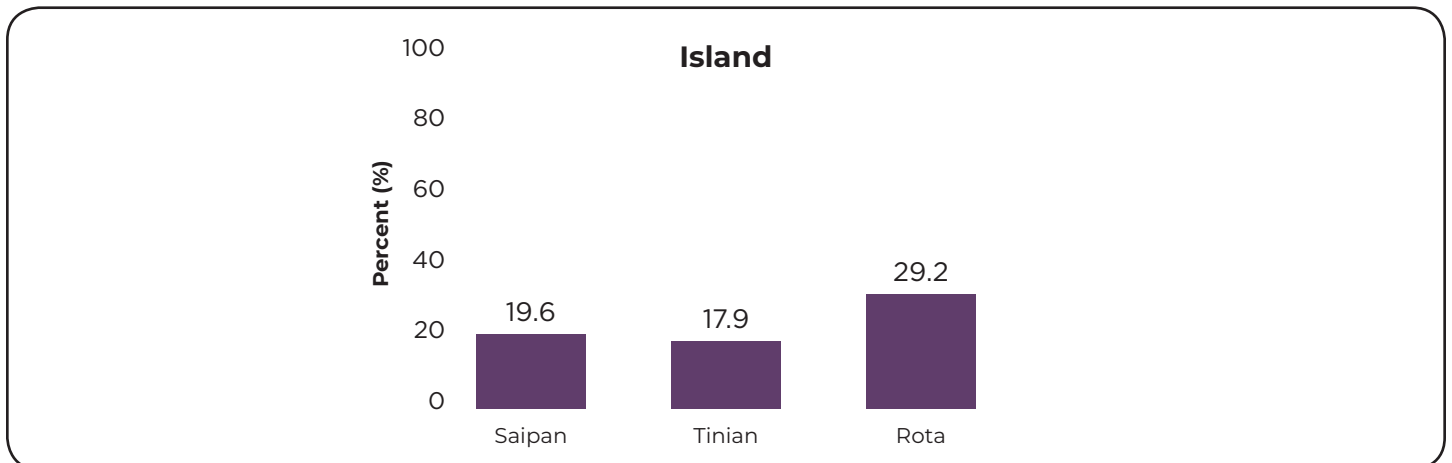


Figure 23. Percentage of Adults who Couldn't get care in the past year, by Island in the CNMI, 2023



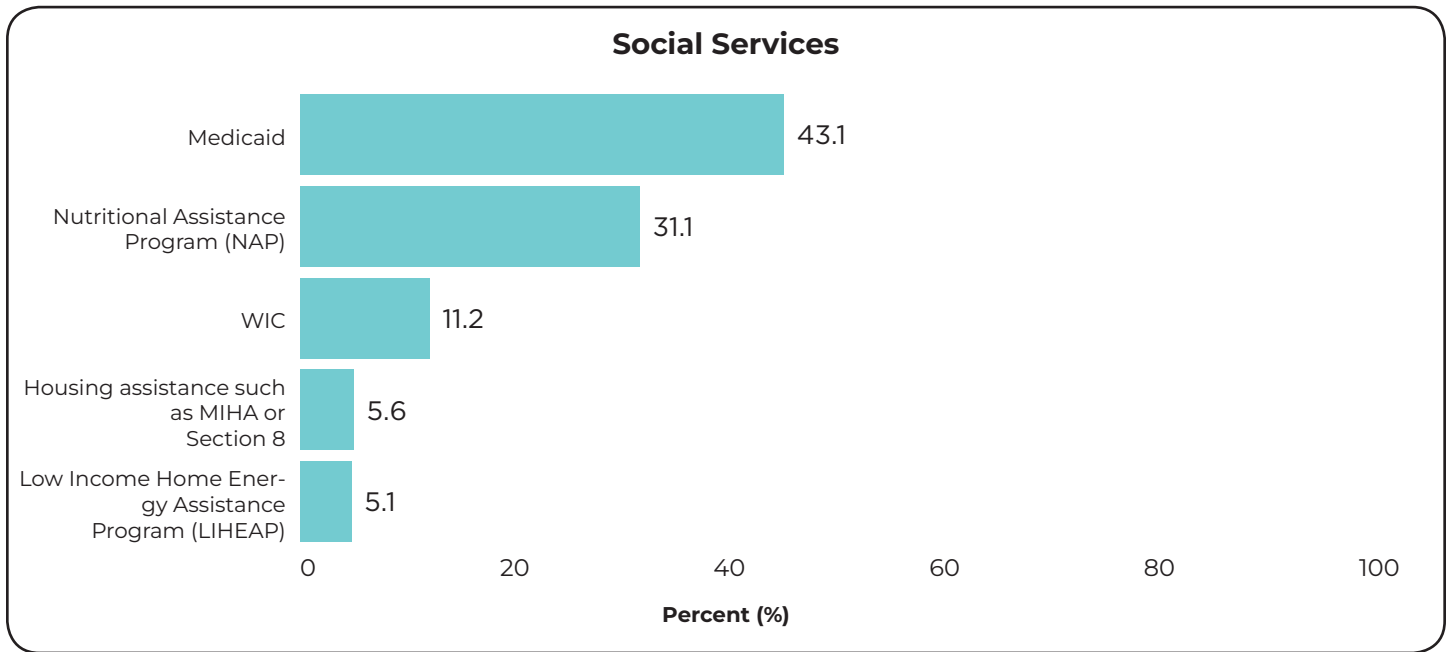
Social Services

More than 2 out of 5 (43.1%) adults in the CNMI participate in or are enrolled in Medicaid.

About 1 out of 3 (31.3%) of adults in the CNMI receive food stamp services through the CNMI Nutrition Assistance Program (NAP). About 1 out of 10 (11.2%) adults in the CNMI receive services from the Women, Infant, Children (WIC) Program. About 1 out of 20 adults in the CNMI receive housing assistance through the Northern Marianas Housing Corporation (NMHC) (5.6%) and the Low Income Home Energy Assistance Program (LIHEAP) (5.1%).



Figure 24. Percentage of Adults participating in or receiving assistance by select programs in the CNMI, 2023



Oral Health

Almost half (47.5%; 95% CI; 45.1% - 49.9%) of adults in the CNMI have had a dental visit in the past year. Additionally, 7.8% of adults reported that they have never had a dental visit. Not having a dental exam in the past year was significantly higher among adults residing in Tinian and Rota, men, those with lower education, and Chamorro, Carolinian, and other Pacific Islander Populations.



Figure 25. Percentage of Adults with NO dental visit in the past year, by Ethnicity in the CNMI, 2023

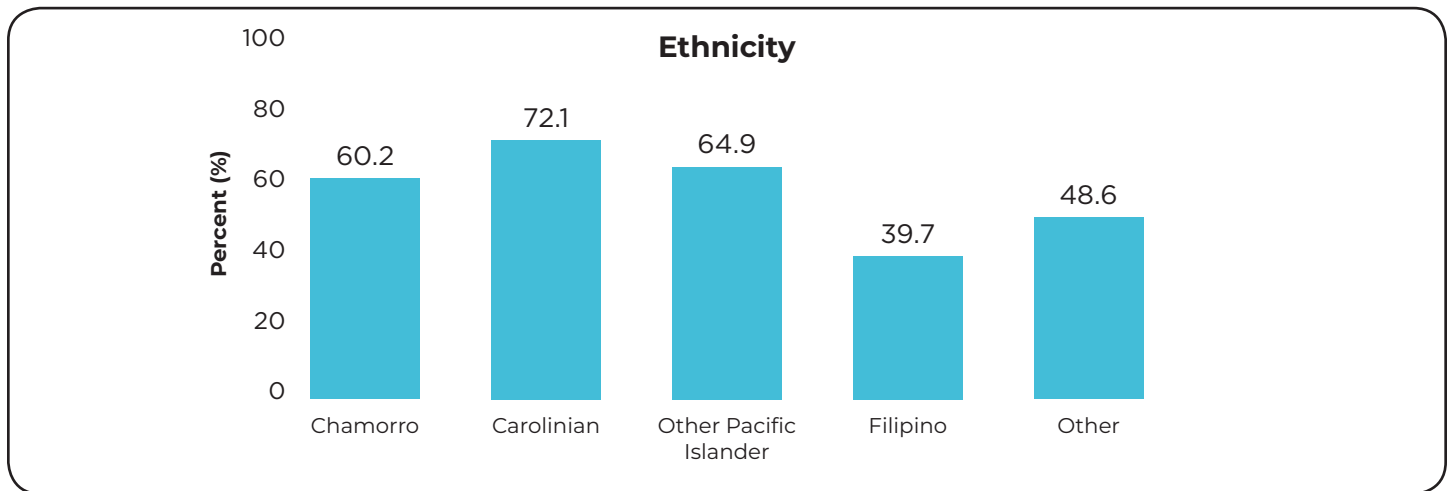
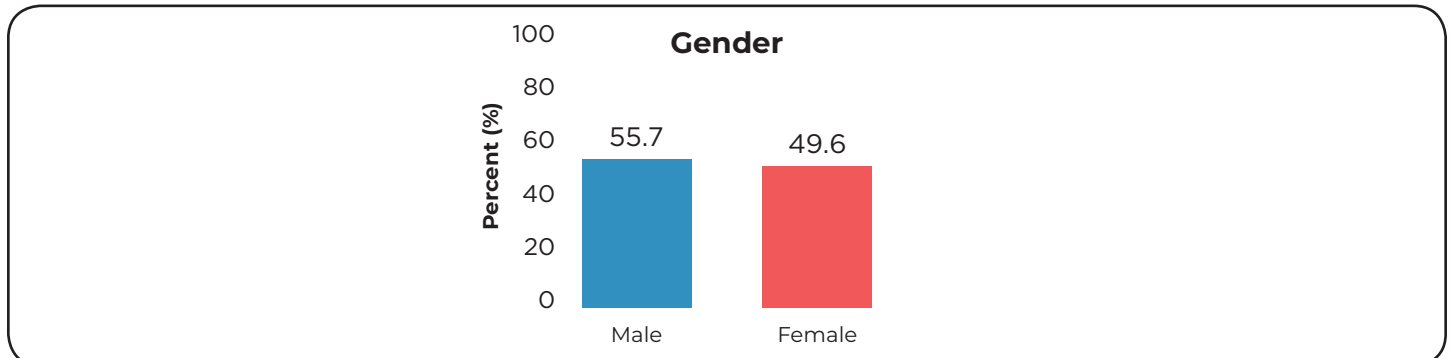


Figure 26. Percentage of Adults with NO dental visit in the past year, by Gender in the CNMI, 2023



Oral Health

Figure 27. Percentage of Adults with NO dental visit in the past year, by Age in the CNMI, 2023

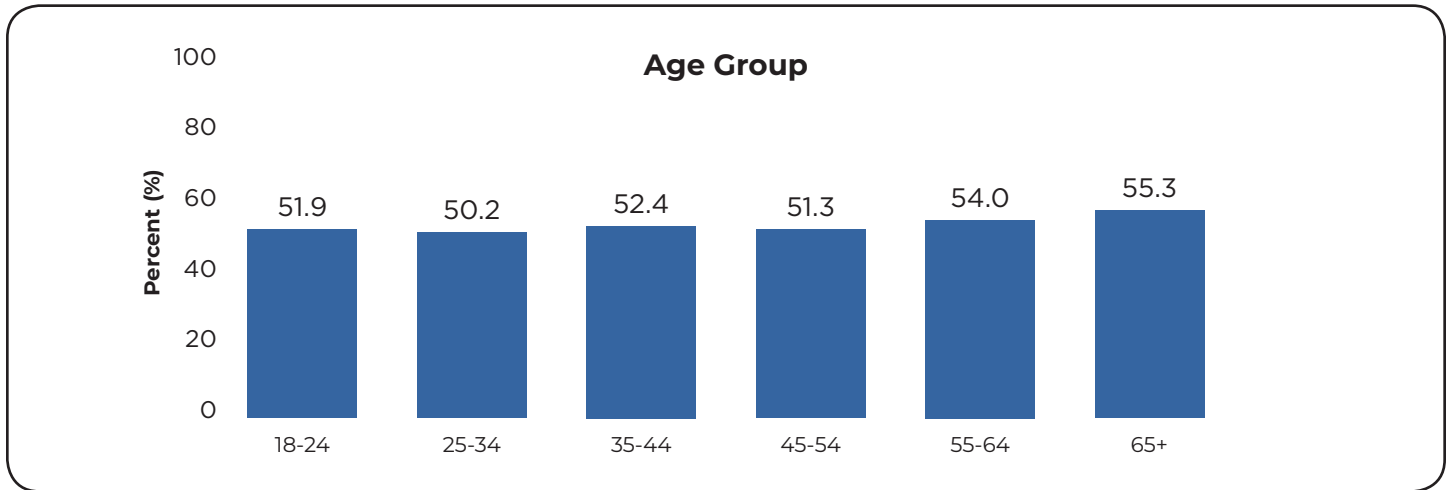


Figure 28. Percentage of Adults with NO dental visit in the past year, by Education in the CNMI, 2023

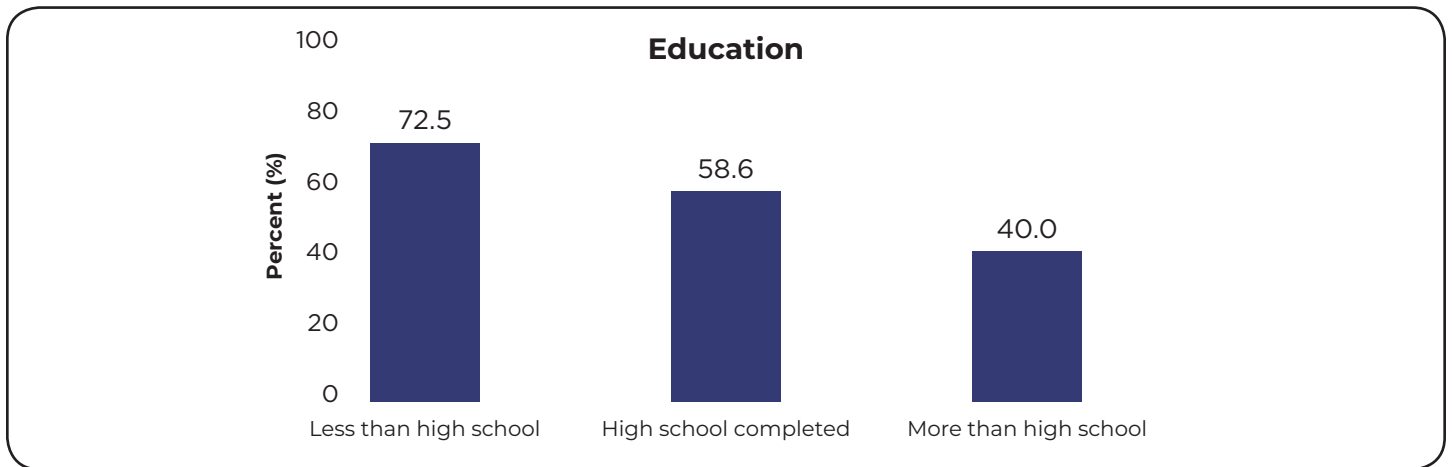
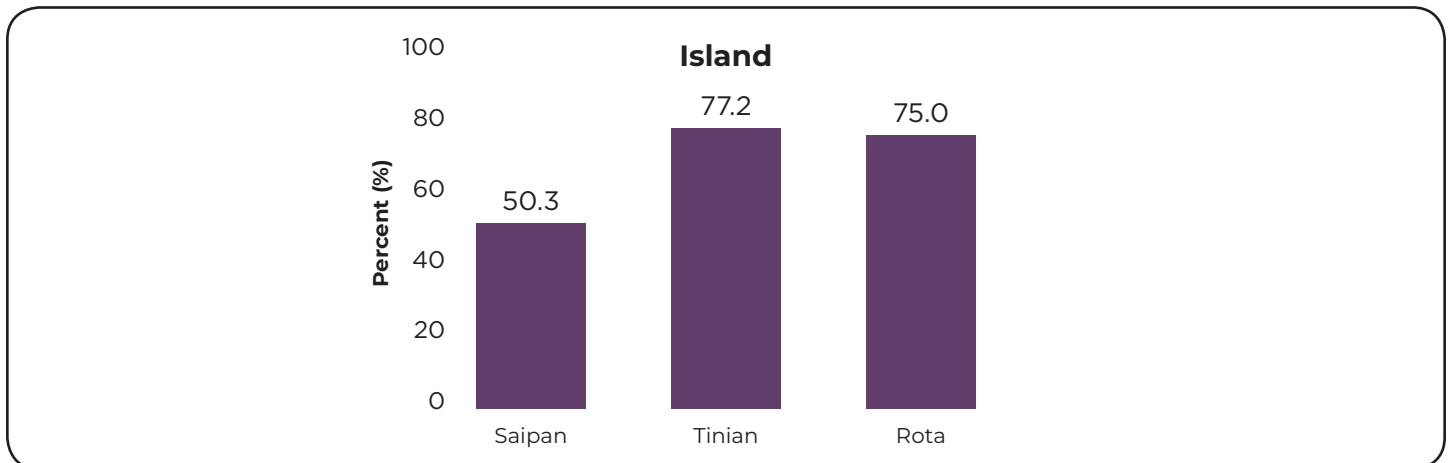


Figure 29. Percentage of Adults with NO dental visit in the past year, by Island in the CNMI, 2023



Oral Health

Over half (57.8%; 95% CI: 55.4%-60.1%) of adults in the CNMI have self-reported that they have at least one missing tooth due to tooth decay or gum disease. Having at least one missing tooth is significantly higher among those residing in Saipan and Rota, older adults, and the Filipino population.

Figure 30. Percentage of Adults who have self-reported missing teeth in the CNMI, 2023

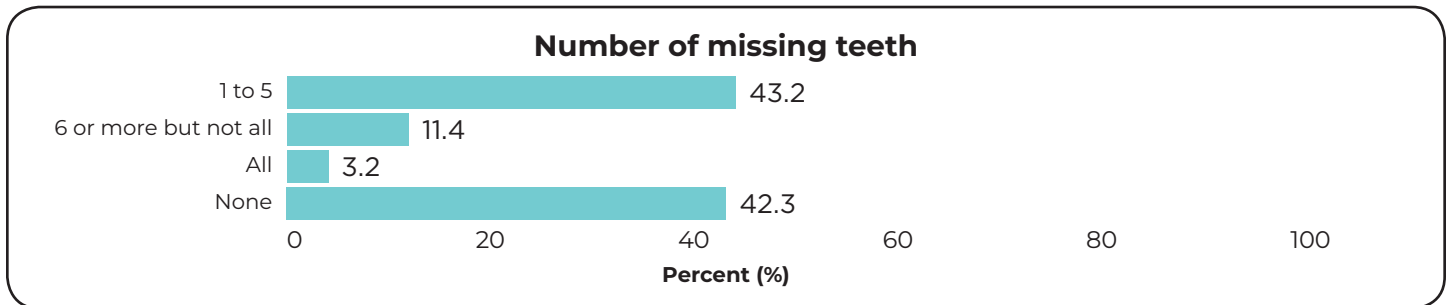


Figure 31. Percentage of Adults with any missing teeth, by Ethnicity in the CNMI, 2023

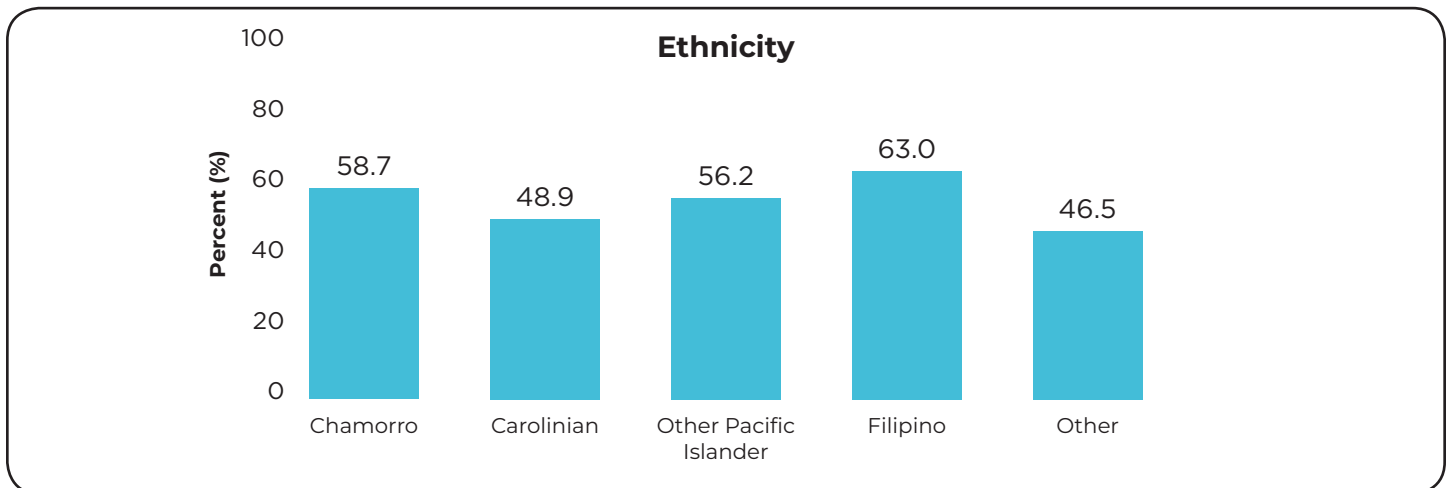
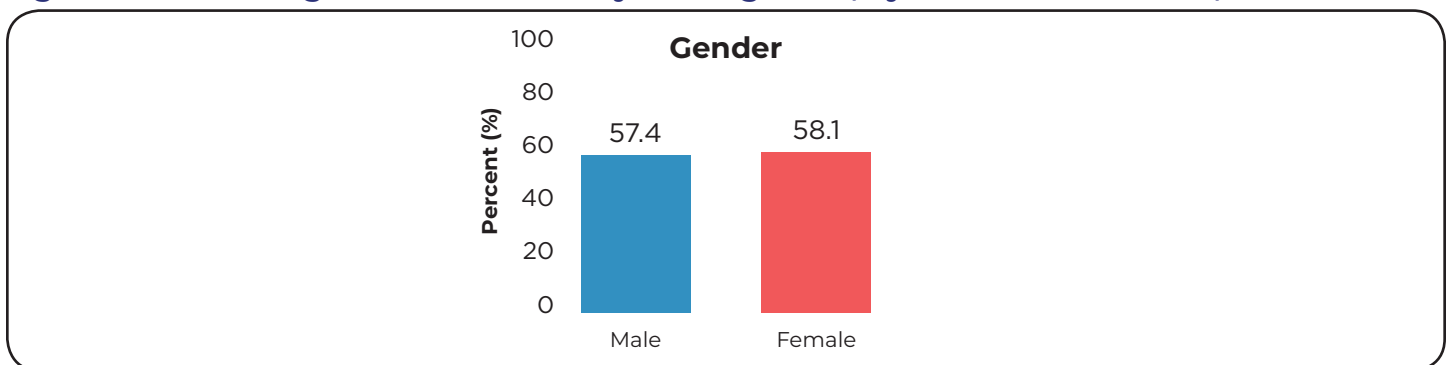


Figure 32. Percentage of Adults with any missing teeth, by Gender in the CNMI, 2023



Oral Health

Figure 33. Percentage of Adults with any missing teeth, by Age in the CNMI, 2023

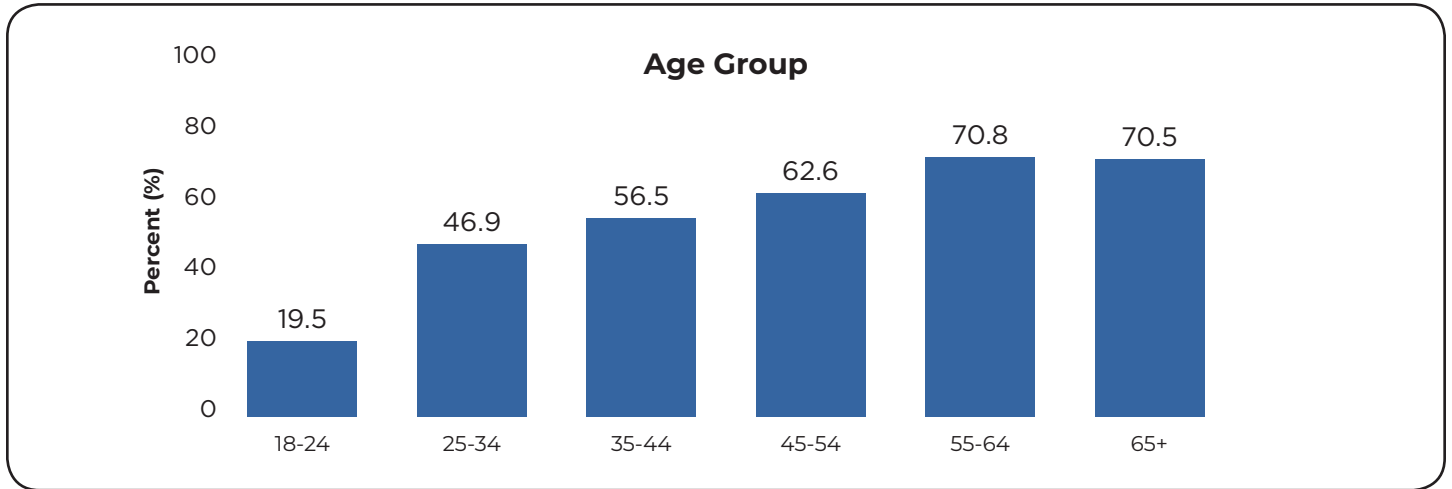


Figure 34. Percentage of Adults with any missing teeth, by Education in the CNMI, 2023

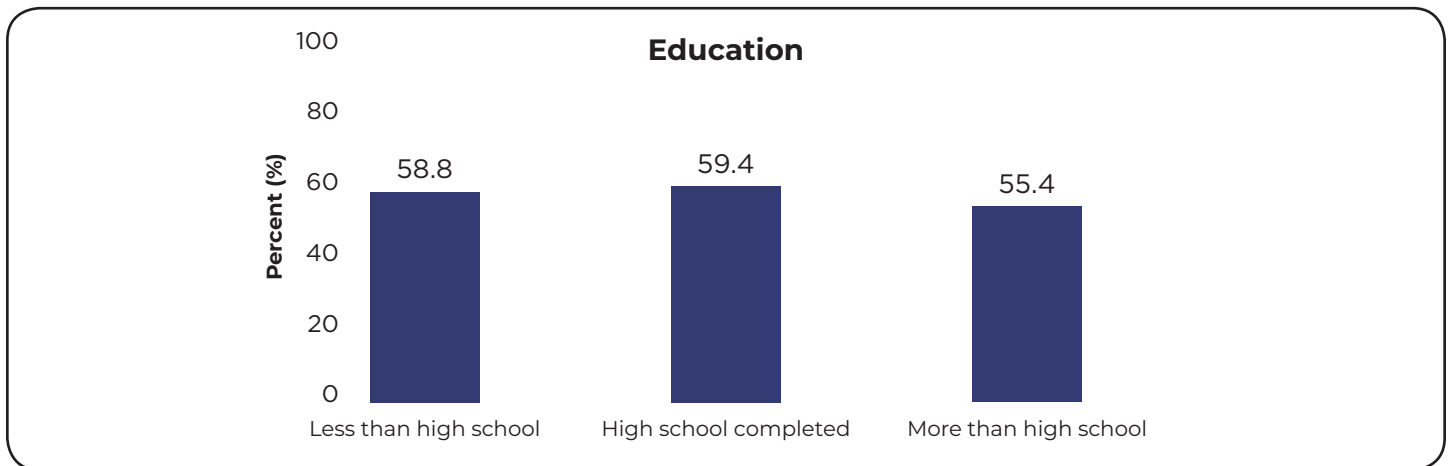
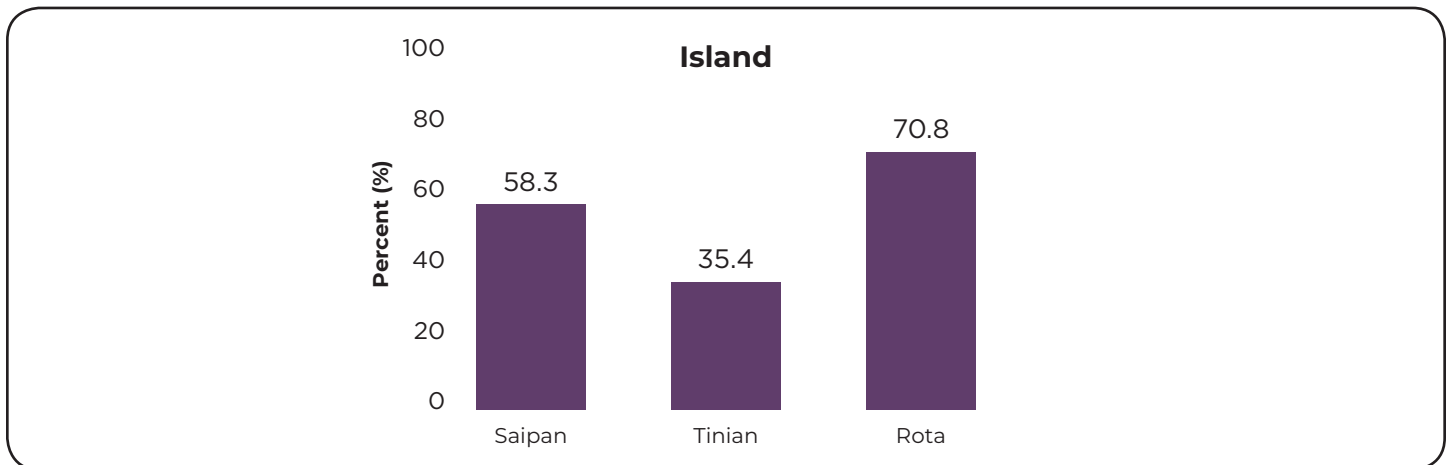


Figure 35. Percentage of Adults with any missing teeth, by Island in the CNMI, 2023



Family Planning

Figure 36. Percentage of women 18-49 years who used a form of contraceptive at last intercourse in the CNMI 2023

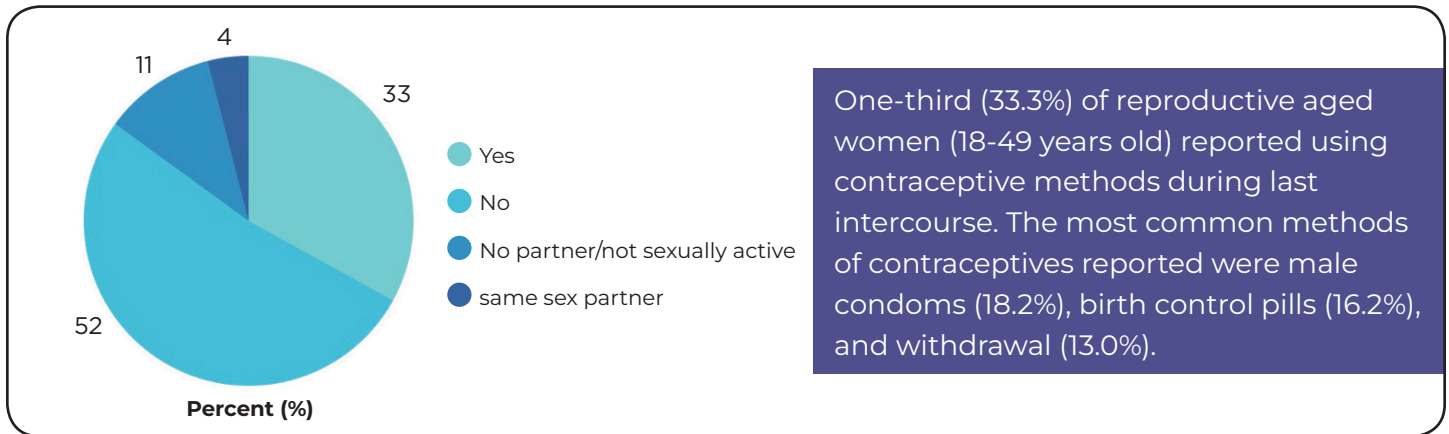
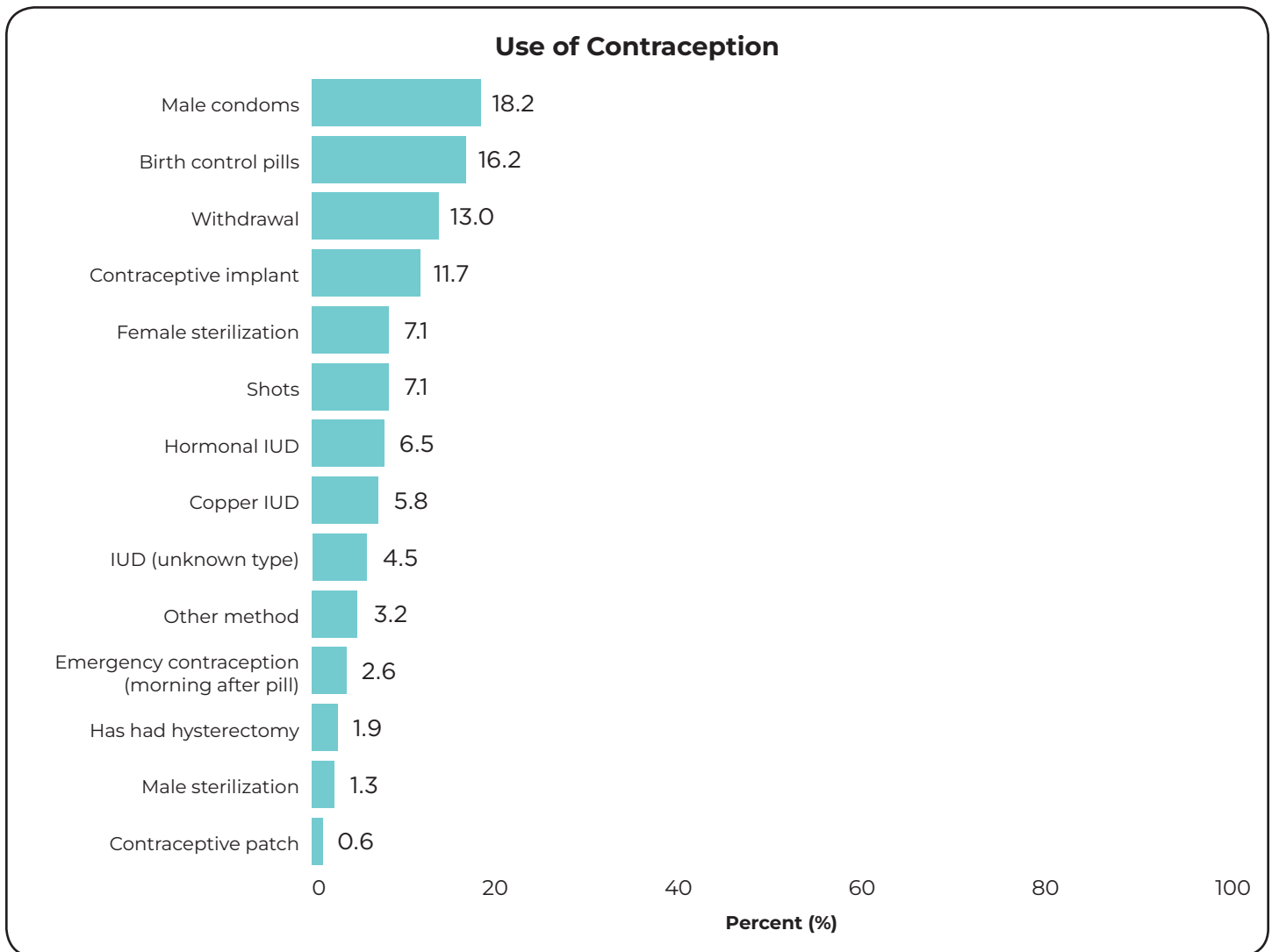


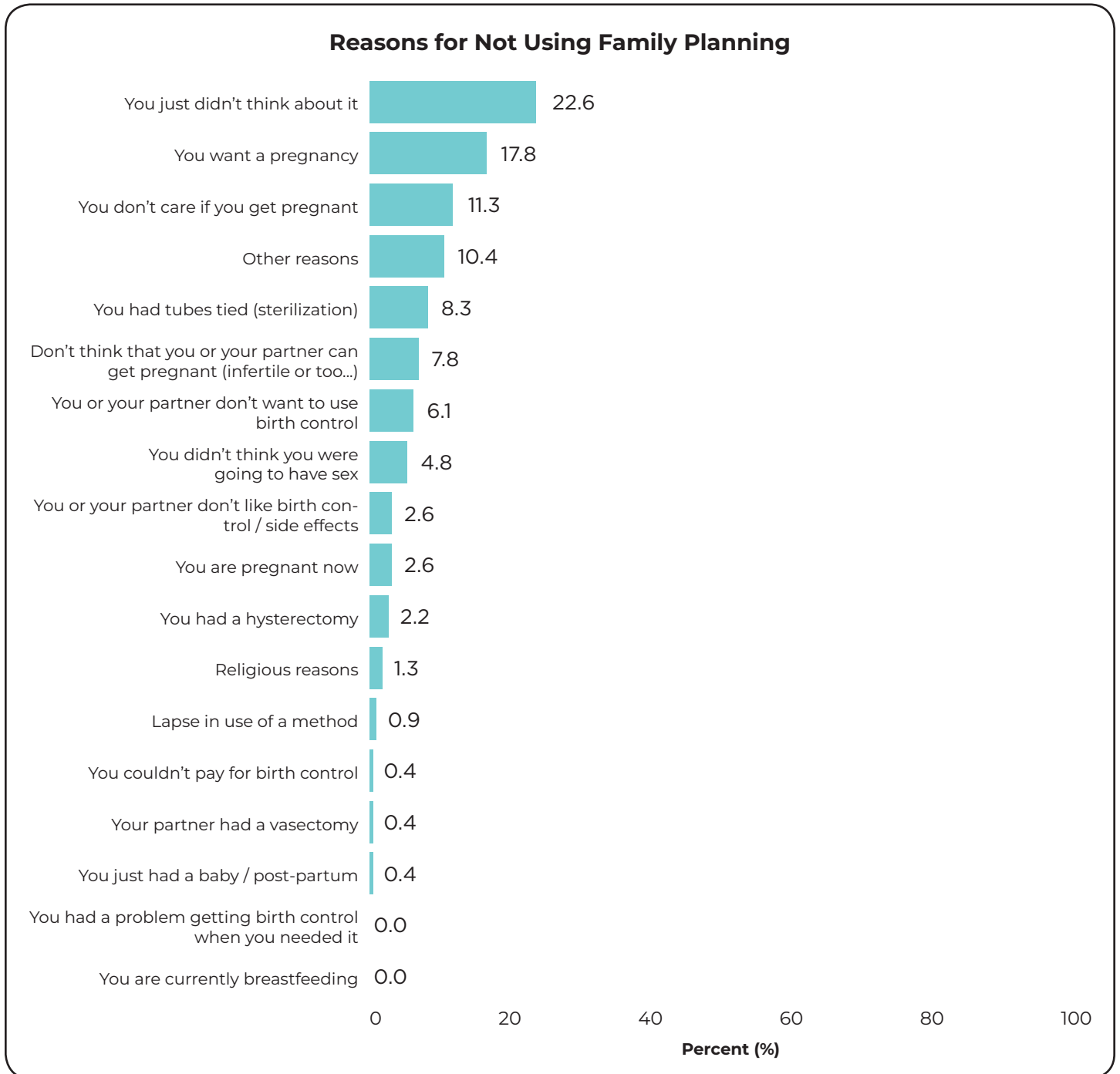
Figure 37. Last contraceptive method used among women 18-49 who reported preventing pregnancy during last intercourse in the CNMI, 2023



Family Planning

Among the 52% of reproductive aged women (18-49 years old) who reported not using family planning during last intercourse, the most commonly reported reasons were “you just didn’t think about it” (22.6%), “you want a pregnancy” (17.8%), and “you don’t care if you get pregnant” (11.3%).

Figure 38. Main reason for not using family planning among women 18-49 who reported not preventing pregnancy during last intercourse in the CNMI, 2023



Overweight / Obesity

Figure 39. BMI Categories among adults in the CNMI, 2023

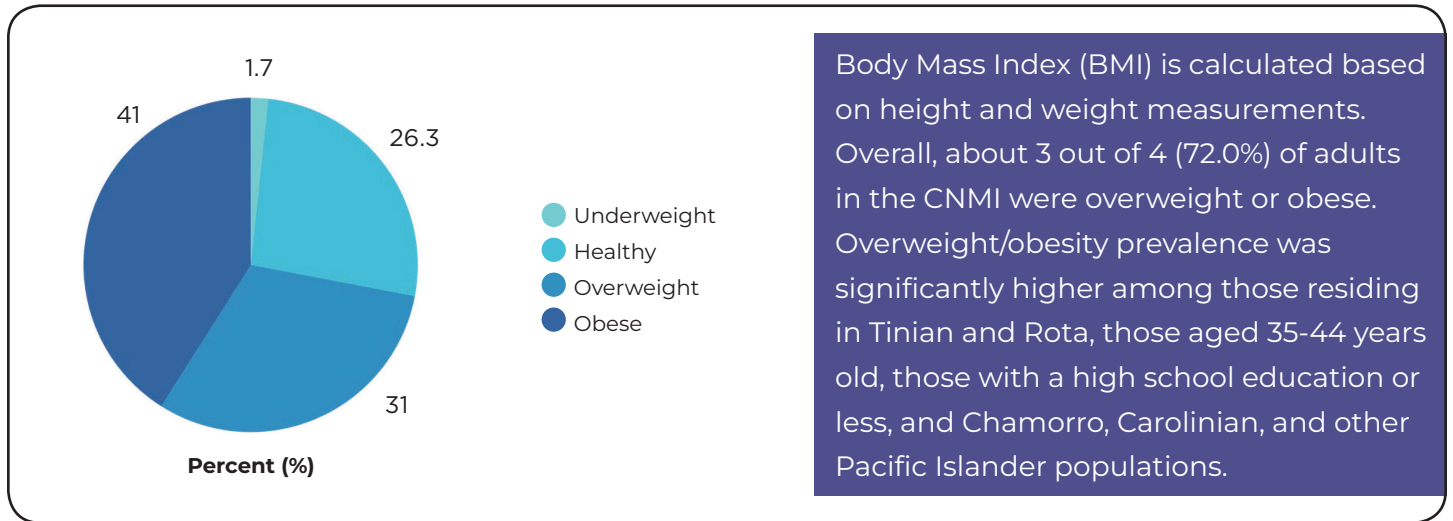


Figure 40. Percentage of Adults who are Overweight/obese, by Ethnicity in the CNMI, 2023

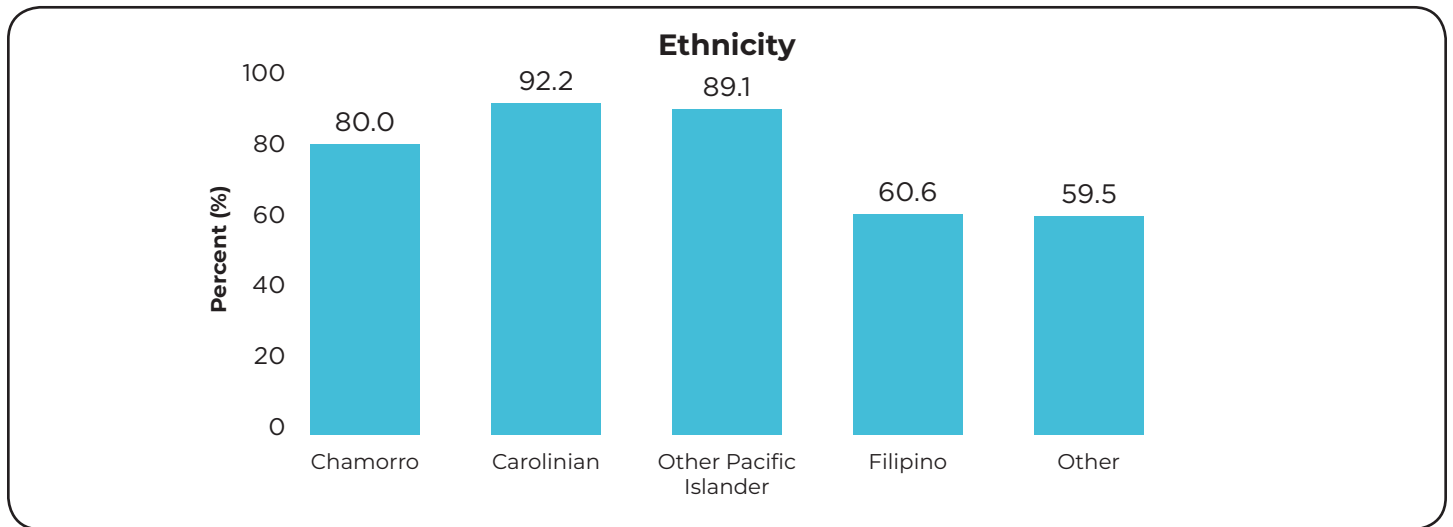
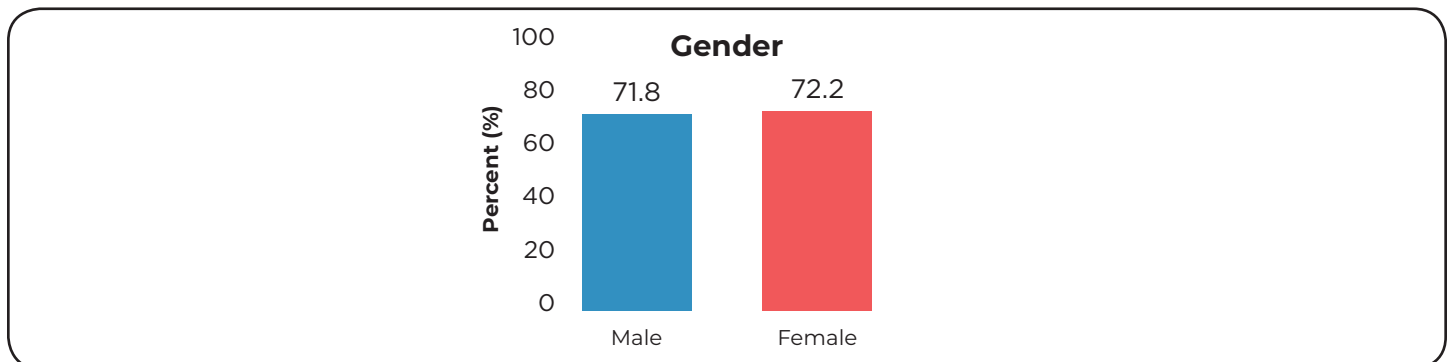


Figure 41. Percentage of Adults who are Overweight/obese, by Gender in the CNMI, 2023



Overweight / Obesity

Figure 42. Percentage of Adults who are Overweight/obese, by Age in the CNMI, 2023

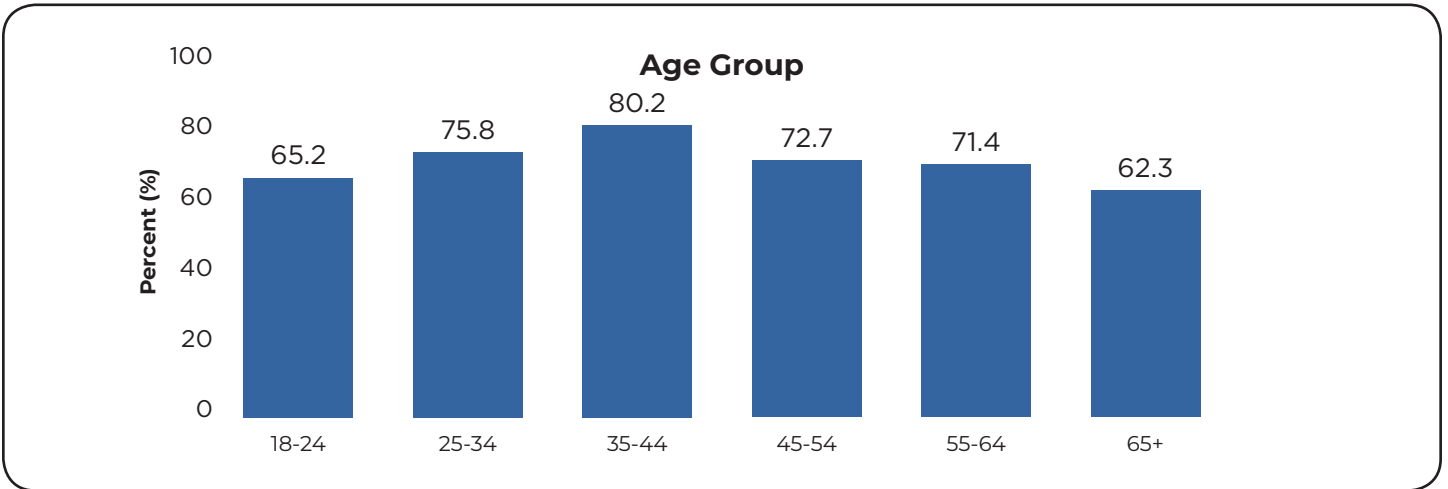


Figure 43. Percentage of Adults who are Overweight/obese, by Education in the CNMI, 2023

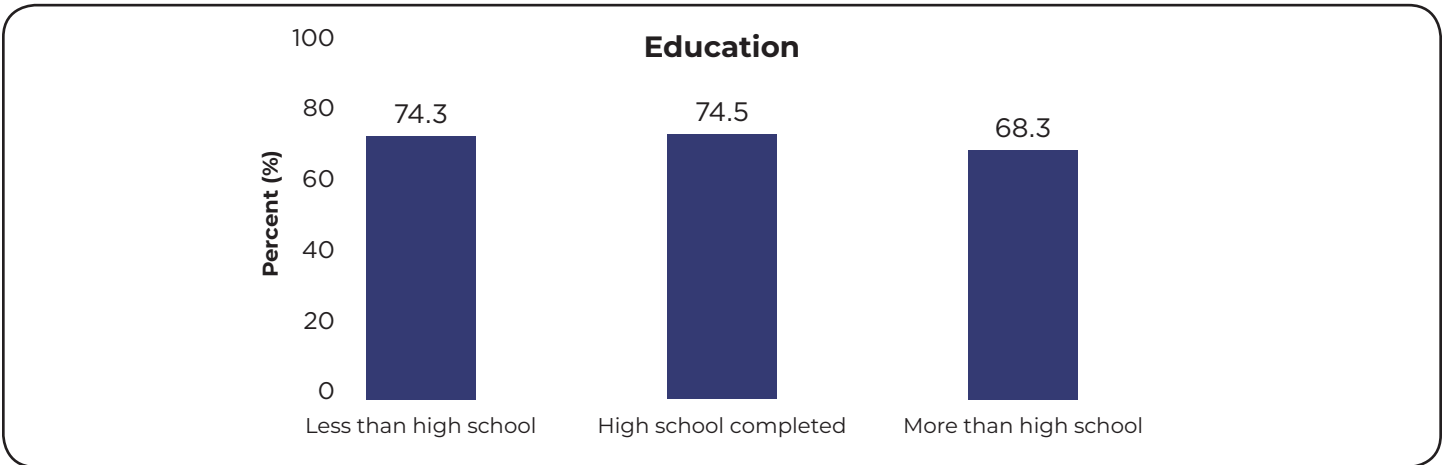
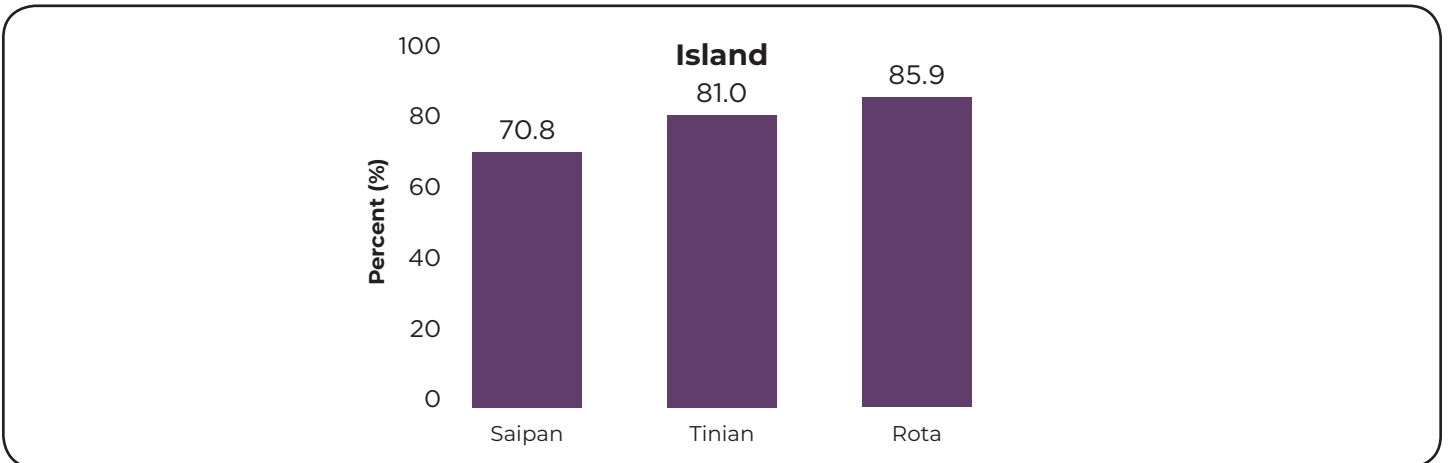


Figure 44. Percentage of Adults who are Overweight/obese, by Island in the CNMI, 2023



Hypertension

Almost half of adults (47.0%; 95% CI: 44.7%-49.4%) in the CNMI had high blood pressure ($\geq 140/90$) during screening or self-reported having hypertension for which they took medication. Hypertension prevalence was significantly higher among those residing in Saipan and among men. Hypertension prevalence significantly increases with age.

Figure 45. Percentage of Adults with Hypertension, by Ethnicity in the CNMI, 2023

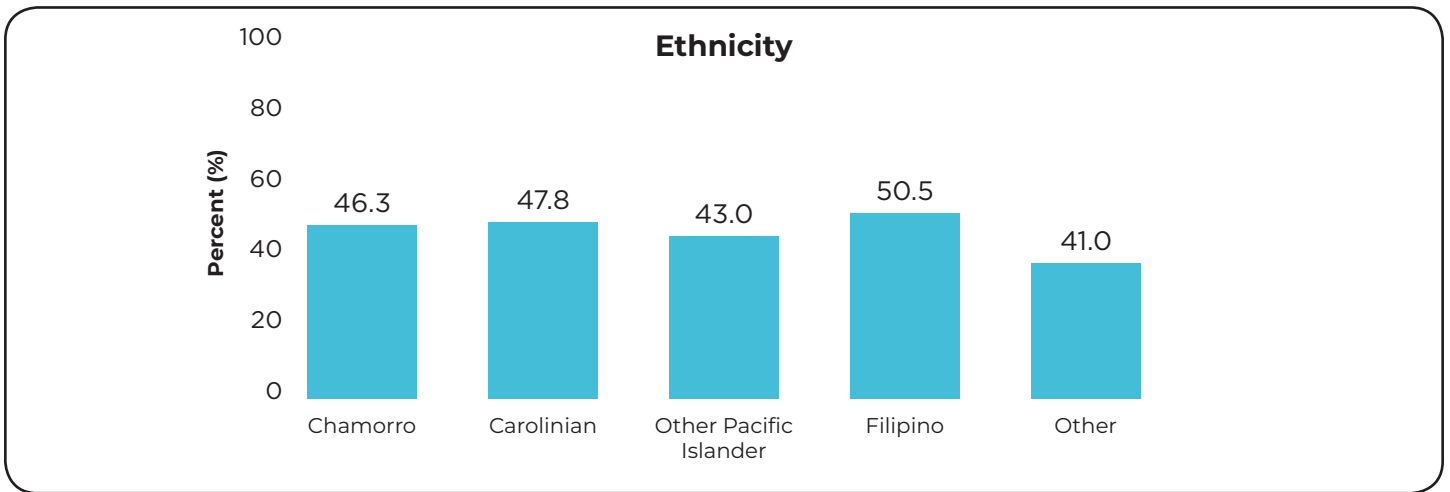
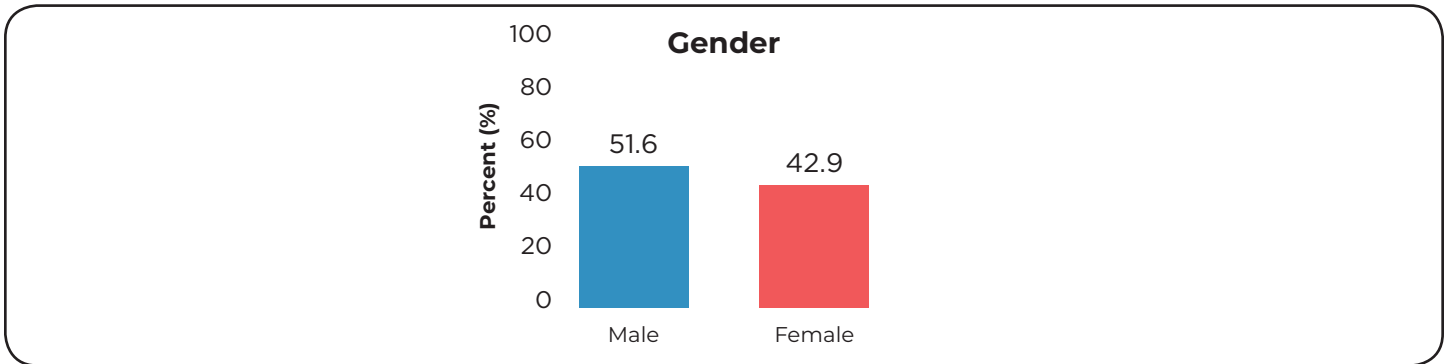


Figure 46. Percentage of Adults with Hypertension, by Gender in the CNMI, 2023



Hypertension

Figure 47. Percentage of Adults with Hypertension, by Age in the CNMI, 2023

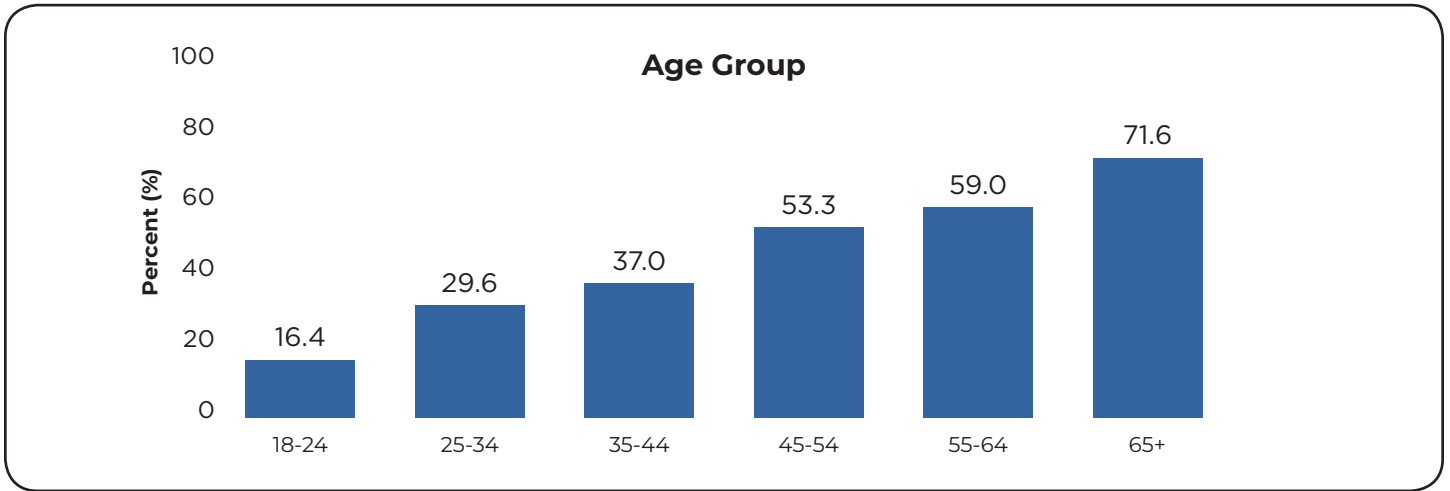


Figure 48. Percentage of Adults with Hypertension, by Education in the CNMI, 2023

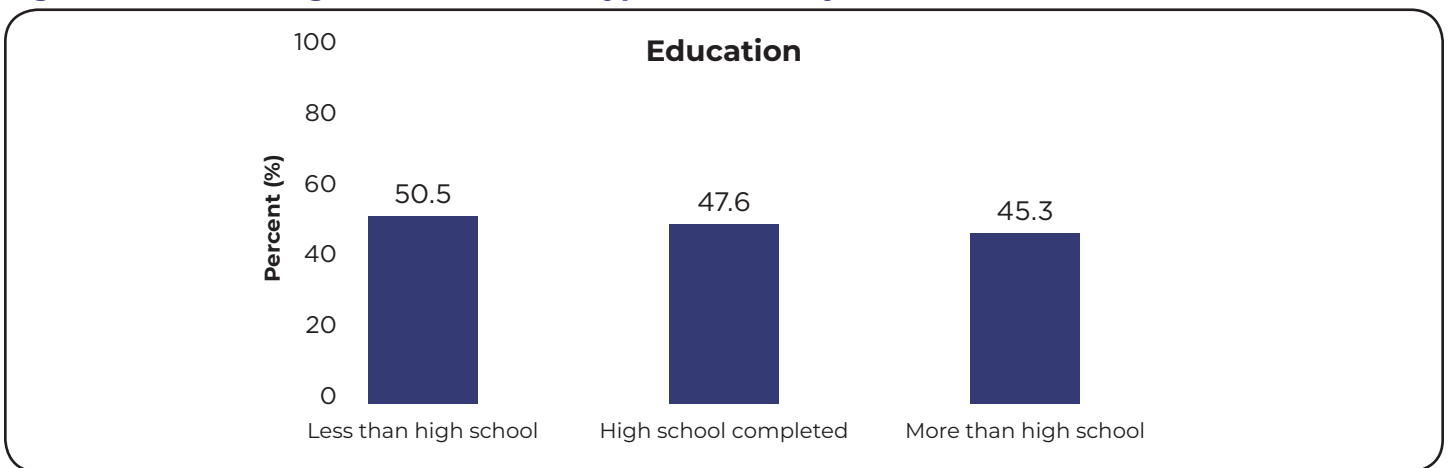
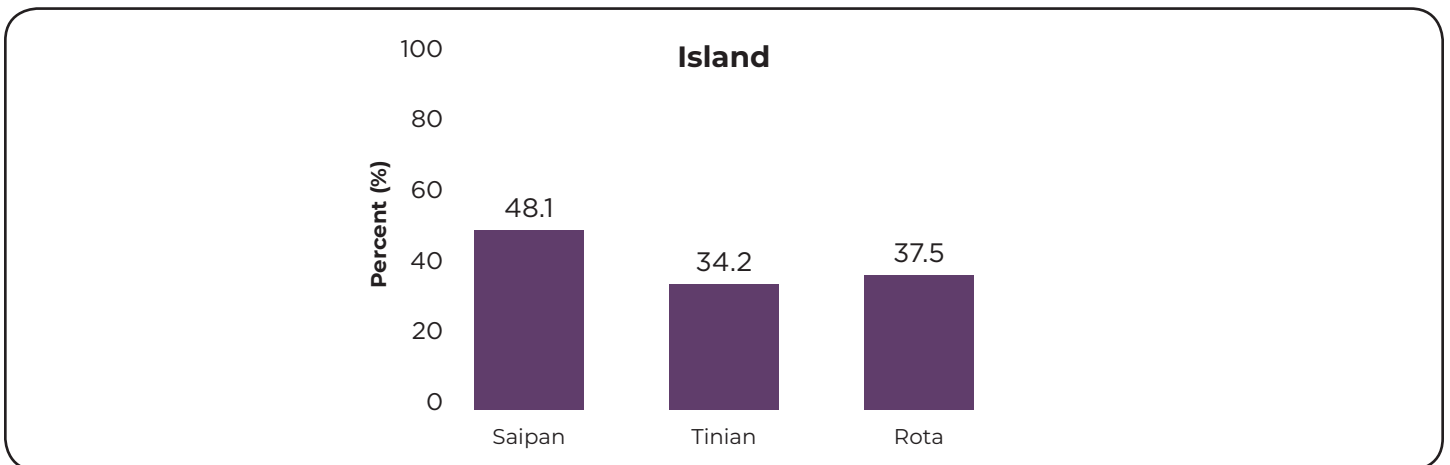


Figure 49. Percentage of Adults with Hypertension, by Island in the CNMI, 2023



Hypertension Diagnosis & Control

Figure 50. Percentage of diagnosis and medication status among hypertensives in the CNMI, 2023

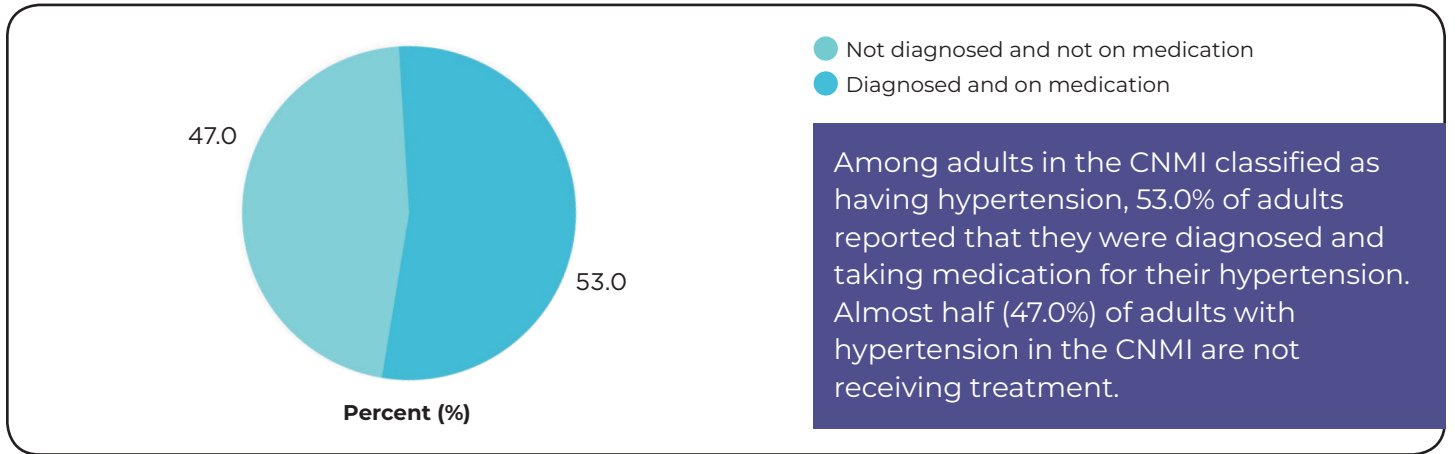
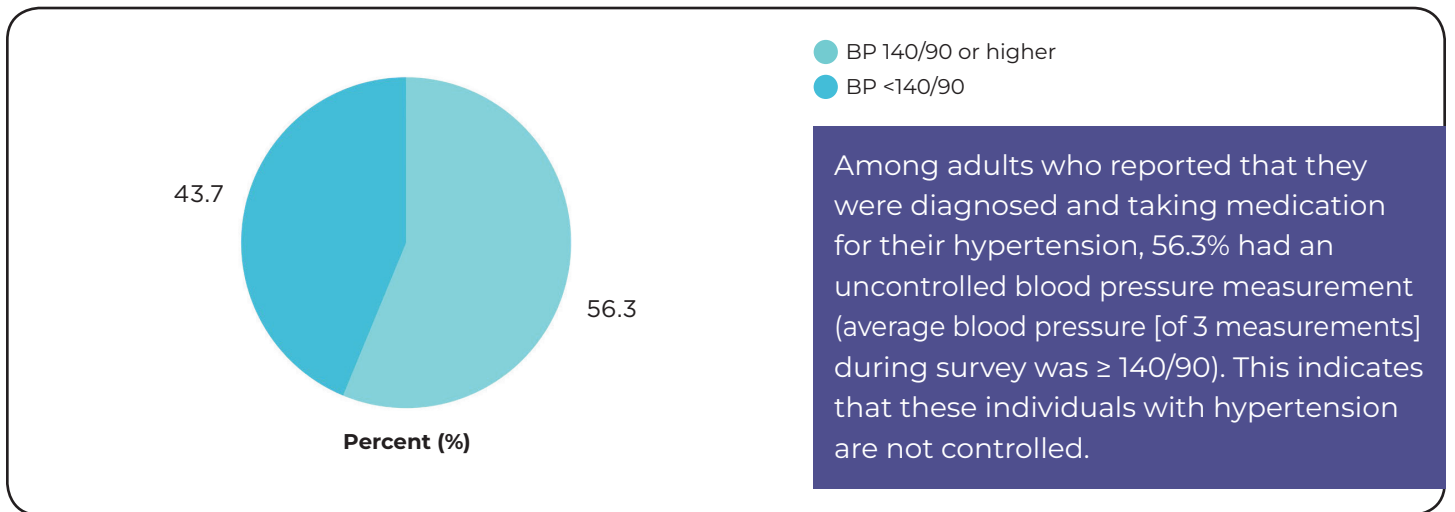


Figure 51. Percentage of blood pressure levels among those hypertensives who are diagnosed and on medication in the CNMI, 2023



Diabetes

Approximately 26.8% (95% CI: 24.7%-29.0%) of adults in the CNMI were estimated to have diabetes (diabetes prevalence is estimated based on either a self-report of having diabetes for which the patient is taking medication and/or an A1c measurement of 6.5% or higher). Diabetes prevalence was significantly higher among those with less than a high school education. Diabetes prevalence also significantly increases with age, with about 2 out of 5 adults 55 and older having diabetes.

Figure 52. Percentage of Adults estimated to have Diabetes, by Ethnicity in the CNMI, 2023

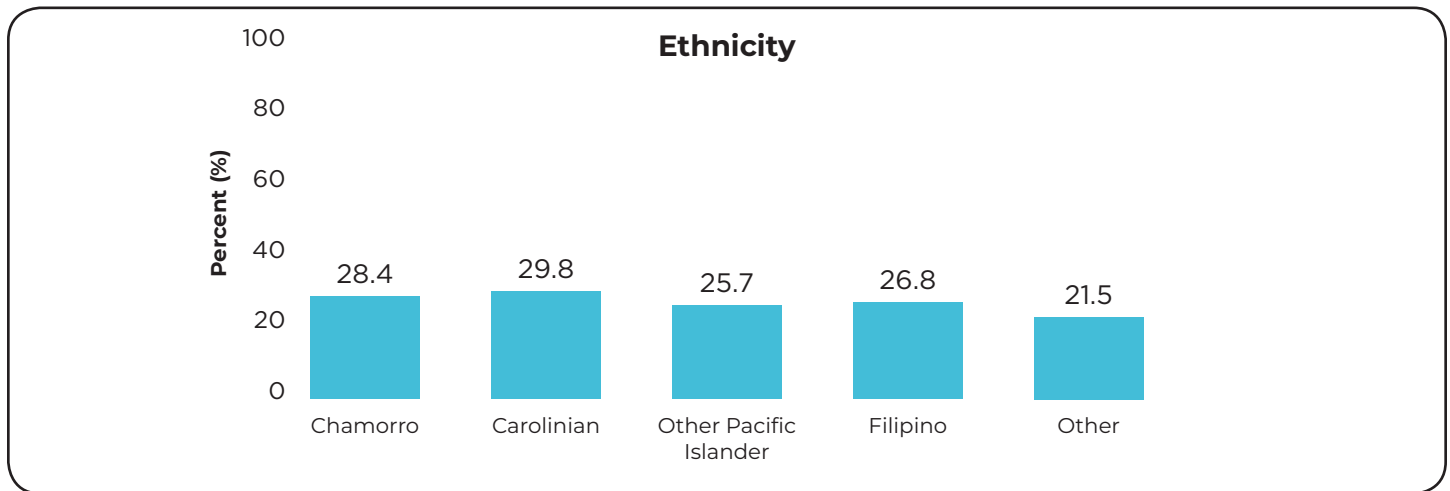
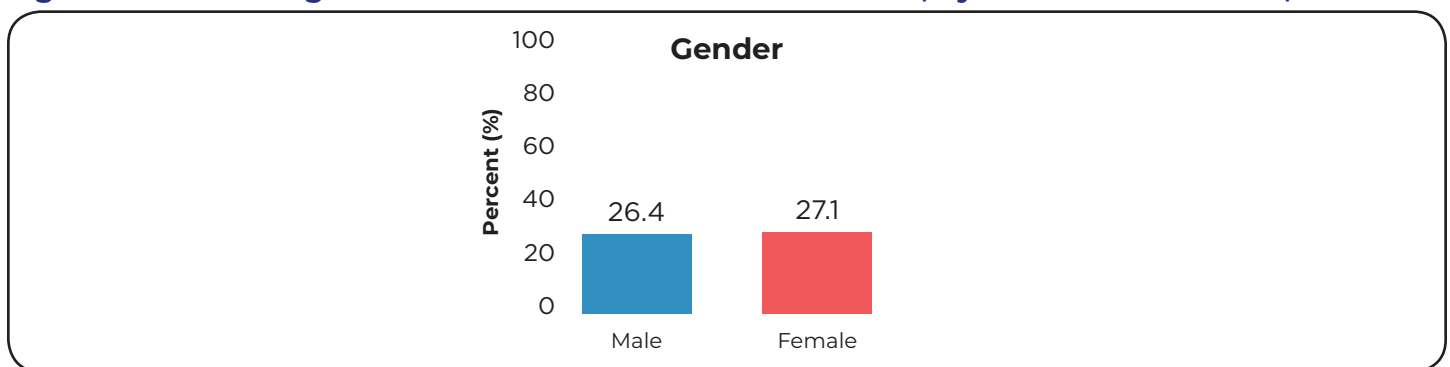


Figure 53. Percentage of Adults estimated to have Diabetes, by Gender in the CNMI, 2023



Diabetes

Figure 54. Percentage of Adults estimated to have Diabetes, by Age in the CNMI, 2023

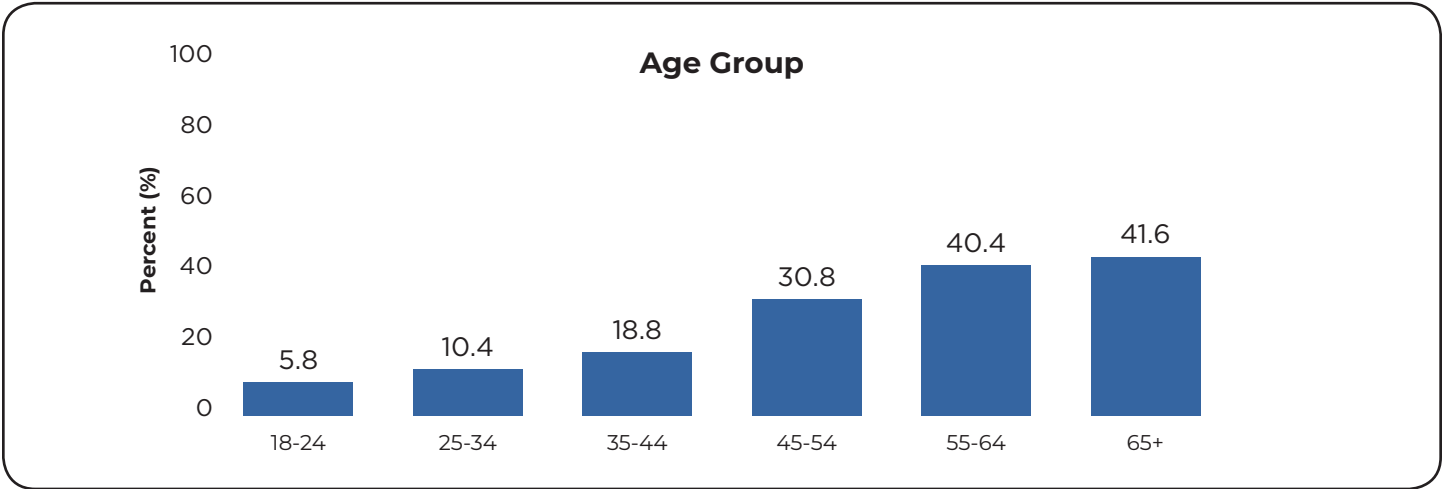


Figure 55. Percentage of Adults estimated to have Diabetes, by Education in the CNMI, 2023

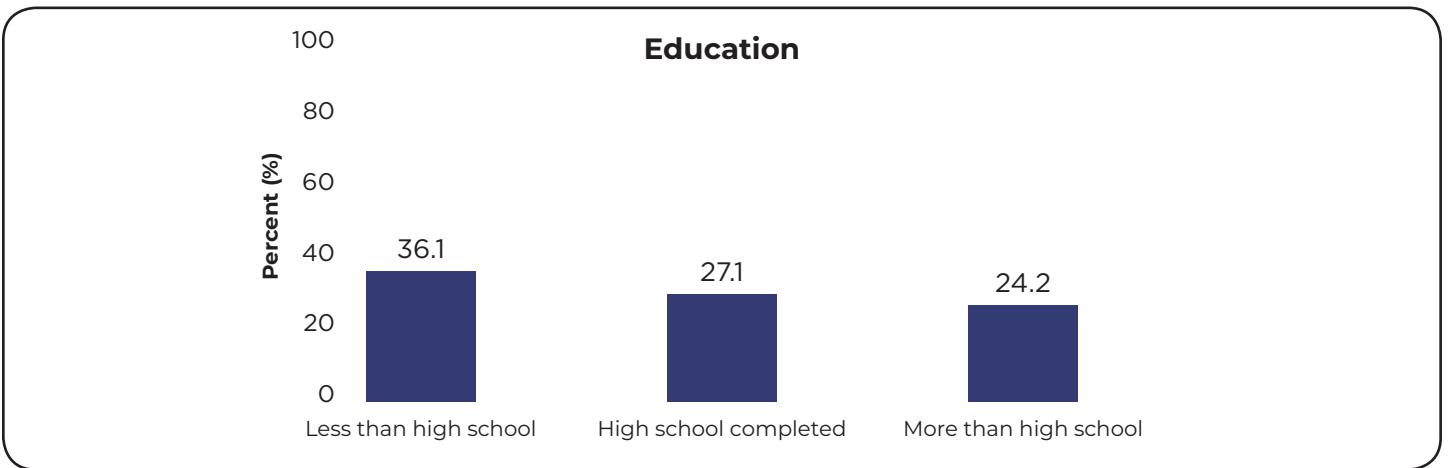
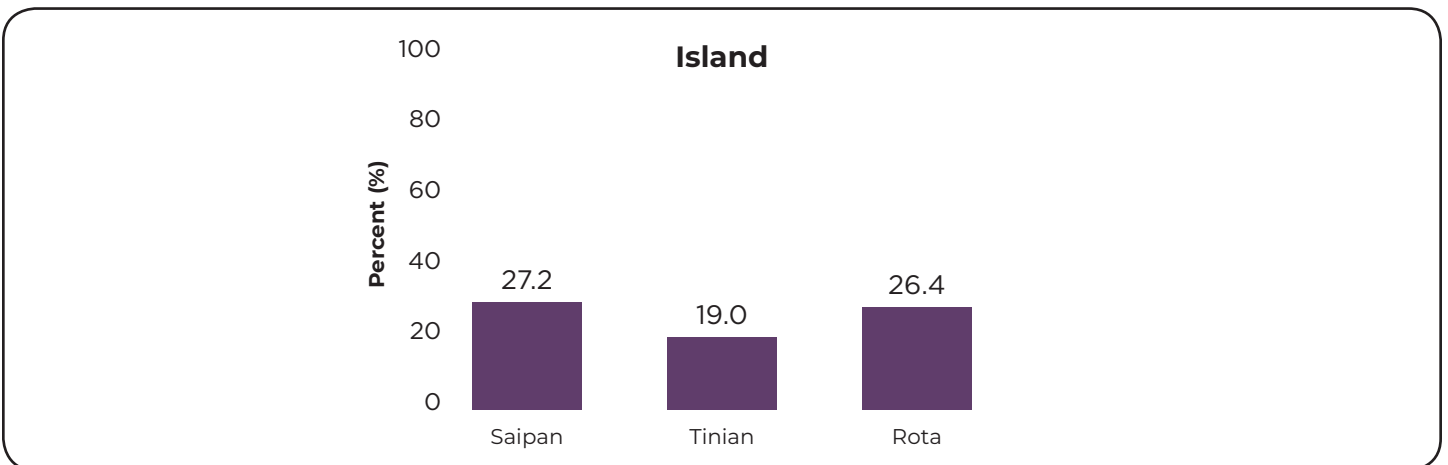


Figure 56. Percentage of Adults estimated to have Diabetes, by Island in the CNMI, 2023



Pre-diabetes

Approximately 29.4% (95% CI: 27.2%-31.7%) of adults in the CNMI were estimated to have pre-diabetes (pre-diabetes prevalence is estimated based on either a self-report of pre-diabetes and/or an A1c measurement of 5.7%-6.4%). Pre-diabetes prevalence was significantly higher among those residing in Tinian and Rota.

Figure 57. Percentage of Adults estimated to have Pre-diabetes, by Ethnicity in the CNMI, 2023

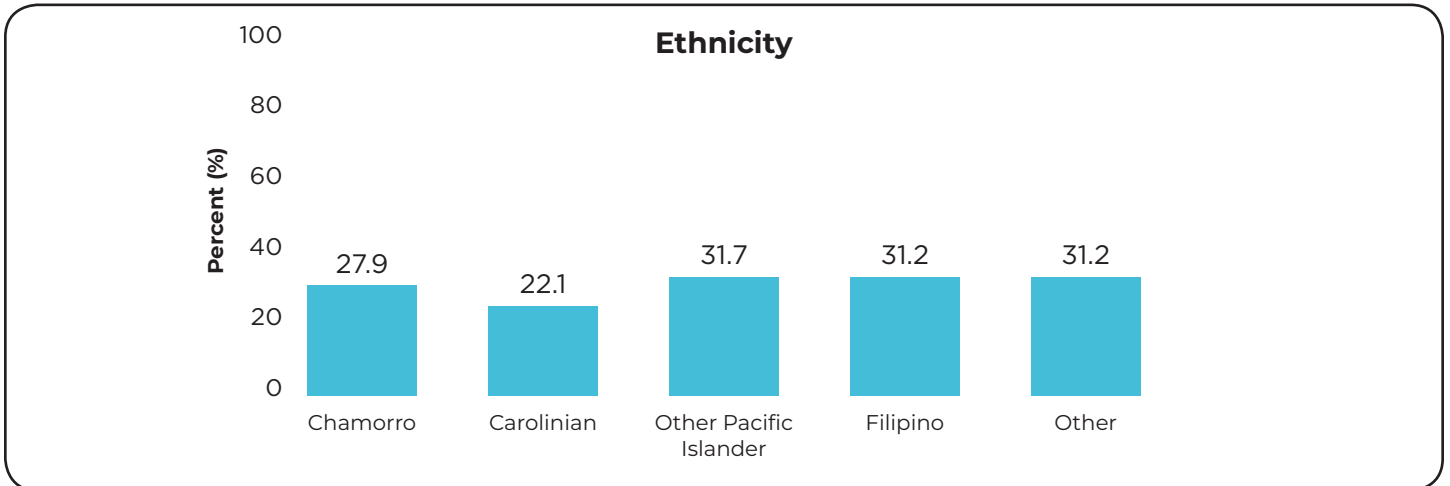
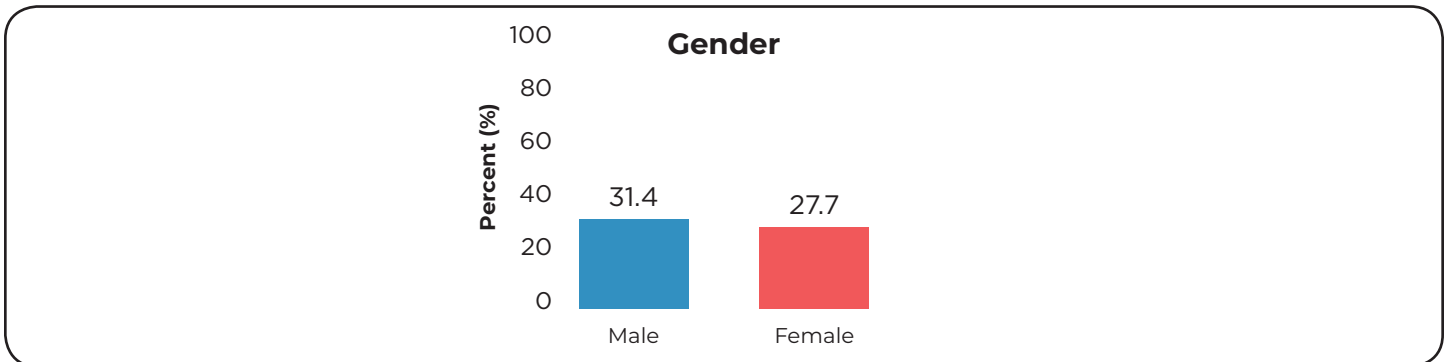


Figure 58. Percentage of Adults estimated to have Pre-diabetes, by Gender in the CNMI, 2023



Pre-diabetes

Figure 59. Percentage of Adults estimated to have Pre-diabetes, by Age in the CNMI, 2023

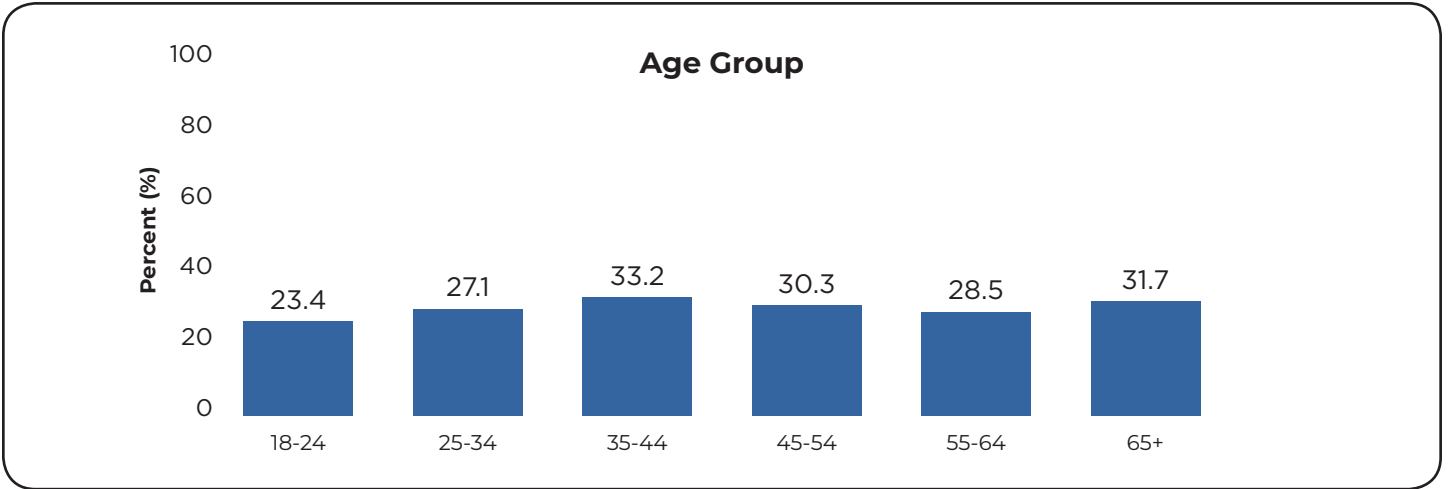


Figure 60. Percentage of Adults estimated to have Pre-diabetes, by Education in the CNMI, 2023

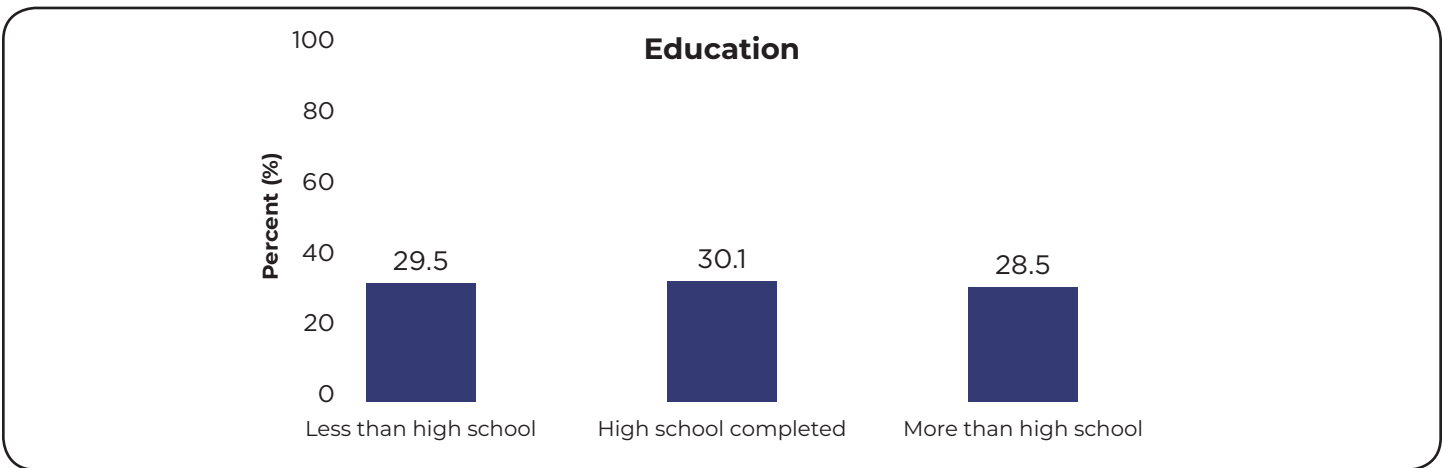
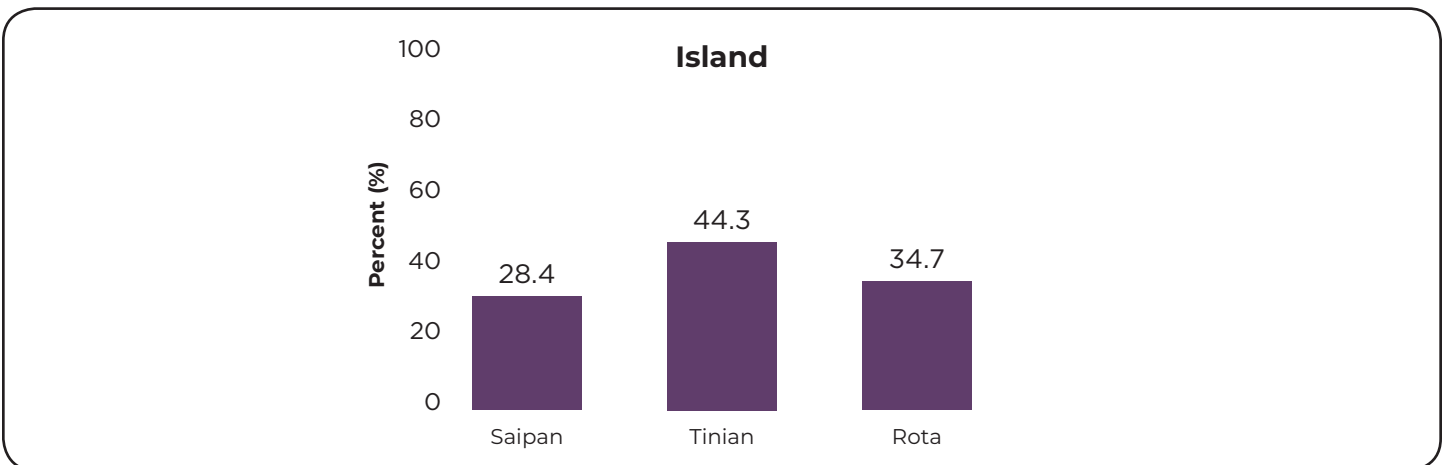


Figure 61. Percentage of Adults estimated to have Pre-diabetes, by Island in the CNMI, 2023



Diabetes Diagnosis & Control

Figure 62. Diagnosis and medication status among diabetics in the CNMI, 2023

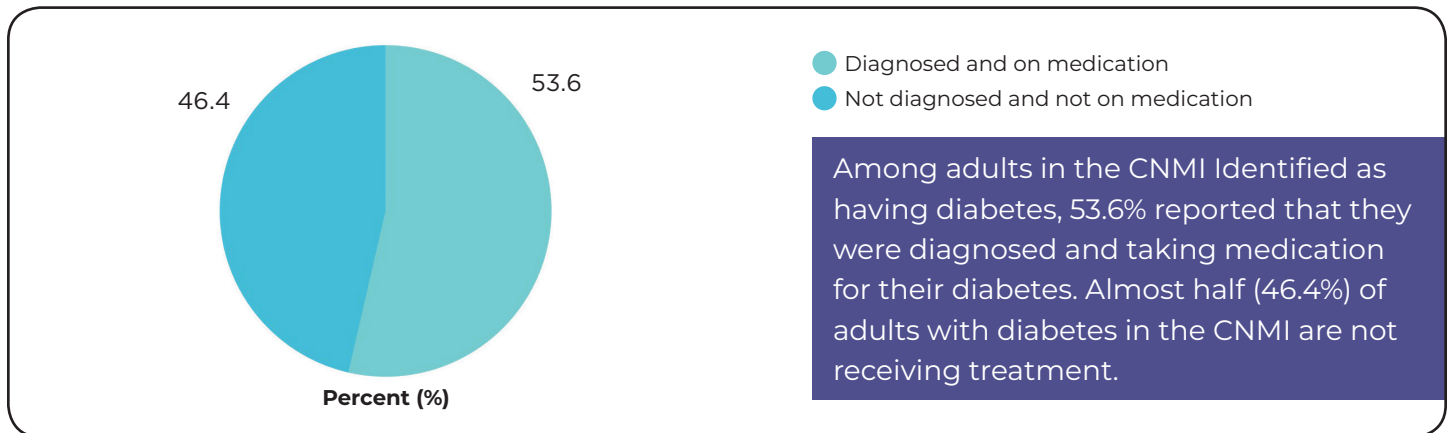
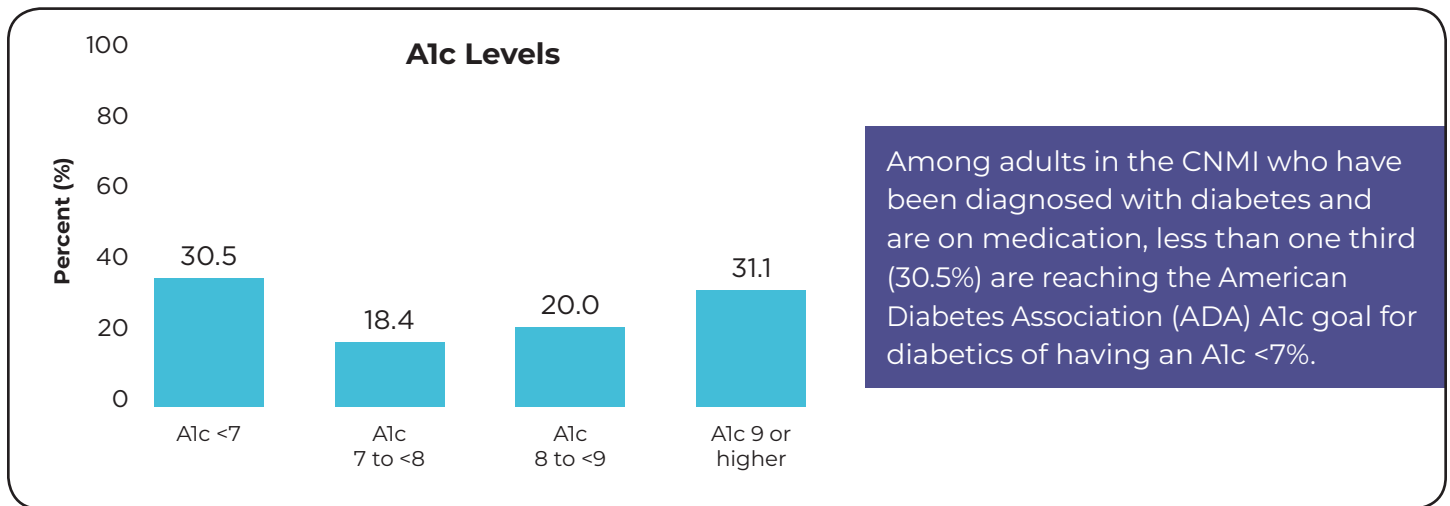


Figure 63. Percentage of Adults with A1c levels among those diabetics who are diagnosed and on medication in the CNMI, 2023



Self-Reported Chronic Disease

These prevalences are based solely on self-report of these conditions. Actual burden of these conditions is likely higher because of lack of self-report due to various reasons including undiagnosed disease, misunderstanding of diagnosis, or lack of health care utilization.

Table 6. Self-reported disease among adults in the CNMI, 2023

	%	95% Confidence Interval	
Hard time breathing or lung problem	9.1	7.8	10.5
Heart problem	8.9	7.6	10.3
Gout	8.3	7.0	9.7
Stroke	3.3	2.5	4.2
Tuberculosis (TB)	3.2	2.5	4.2
Heart attack	3.1	2.4	4.0
Pulmonary disease	1.3	0.8	1.9
Rheumatic heart problem	1.2	0.7	1.8



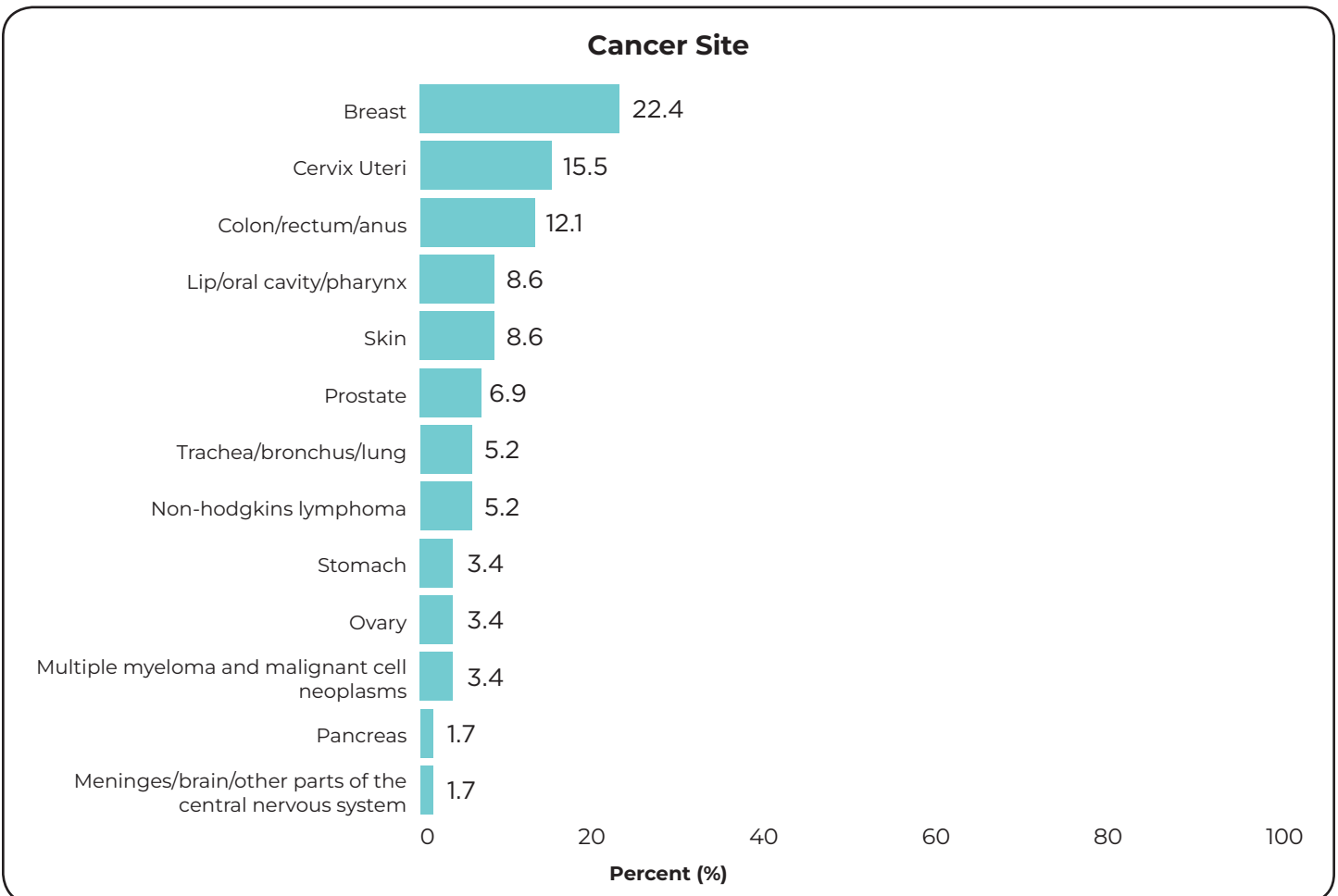
Cancer

Among adults in the CNMI, 3.5% reported having been diagnosed with cancer. Among those, 93.5% reported only one type of cancer, and 24.6% are currently receiving treatment for their cancer. The average age of cancer diagnosis was 48 years. The most reported cancers were breast, cervix uteri, and colon/rectum/anus.

Table 7. Self-reported cancer diagnosis among adults in the CNMI, 2023

Percent of adults who have been diagnosed with cancer	3.5%
Percent of adults who have been diagnosed with cancer reporting only one type of cancer	93.5%
Percent of adults who have been diagnosed with cancer who are currently receiving treatment	24.6%
Average age of diagnosis	48

Figure 64. Cancer site among Adults who self-reported having cancer, in the CNMI, 2023



Cigarette Smoking

About 1 out of 5 (21.4%; 95% CI: 19.5%-23.4%) adults in the CNMI reported cigarette smoking in the last 30 days (current smoking). Among current smokers, 71.4% reported smoking every day in the past 30 days. Among current every-day smokers, the average age of smoking initiation was 20 years old, and the average number of cigarettes smoked per day is 11.

Among current smokers, 80.1% reported that they want to quit smoking, and 61.8% reported that they quit smoking for one day or more in the past year in an attempt to quit smoking.

Table 8. Smoking prevalence among adults in the CNMI, 2023

Current smoking prevalence (smoked in past 30 days)	21.4%
Percent of current smokers who smoke every day	71.4%
Average age of initiation among current every-day smokers	20
Average number of cigarettes smoked per day among current every-day smokers	11
Percent of current smokers who want to quit	80.1%
Percent of current smokers who have tried to quit in the past year	61.8%

Cigarette Smoking

Smoking prevalence in CNMI was higher among men, those aged 35-54 years old, those who completed high school only, those residing in Tinian and Rota, and the Chamorro population.

Figure 65. Percentage of Adults Currently Smoking, by Ethnicity, in the CNMI, 2023

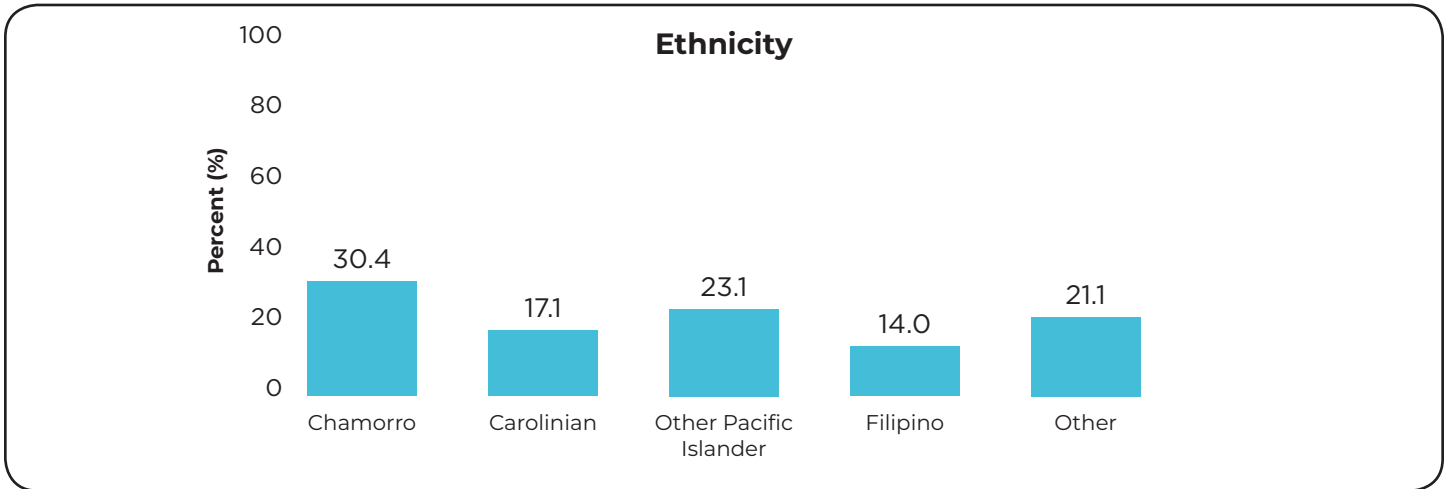
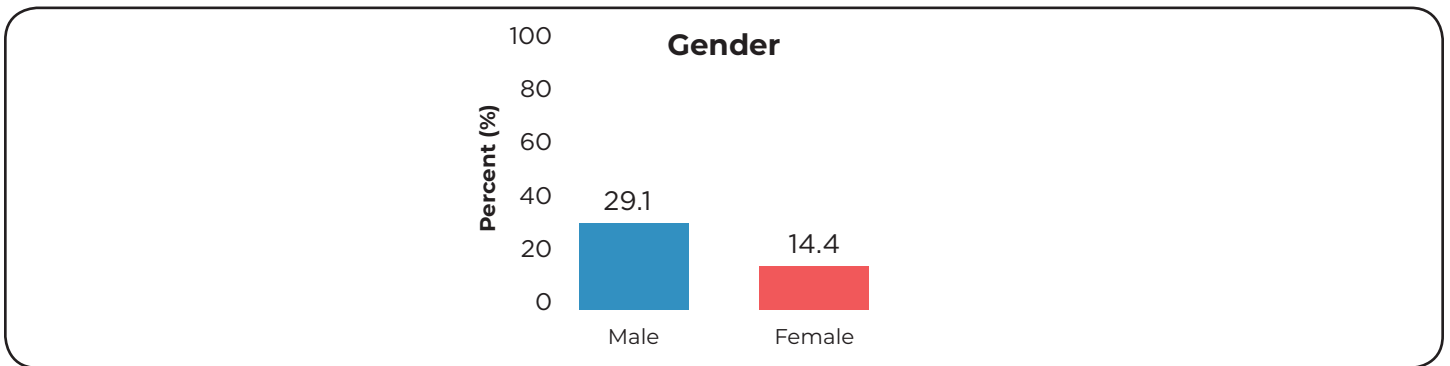


Figure 66. Percentage of Adults Currently Smoking, by Gender, in the CNMI, 2023



Cigarette Smoking

Figure 67. Percentage of Adults Currently Smoking, by Age, in the CNMI, 2023

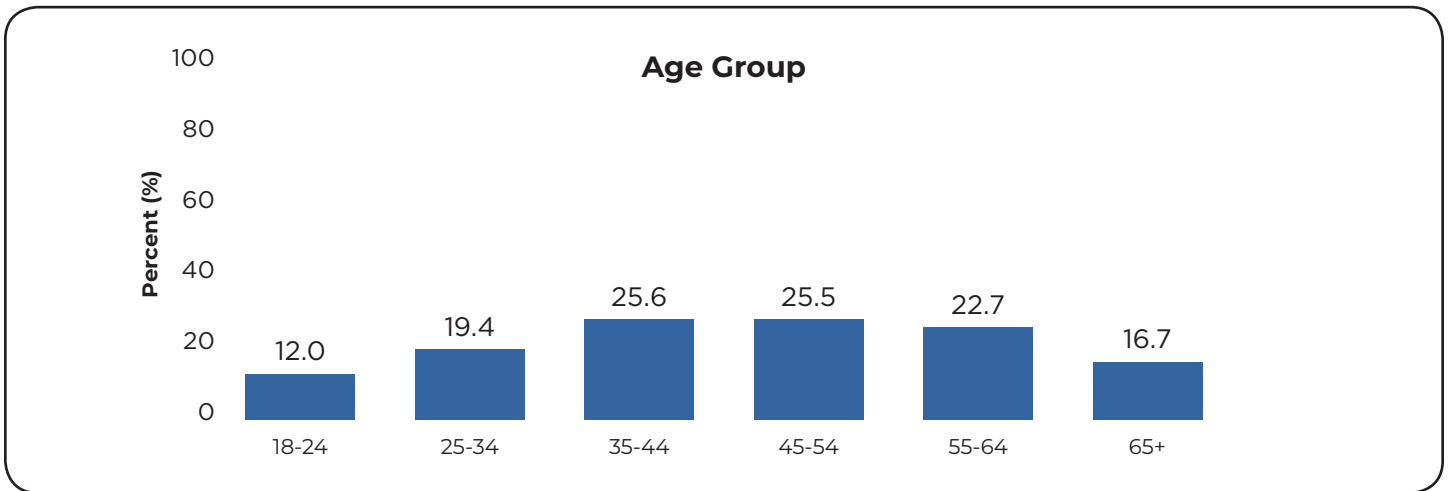


Figure 68. Percentage of Adults Currently Smoking, by Education, in the CNMI, 2023

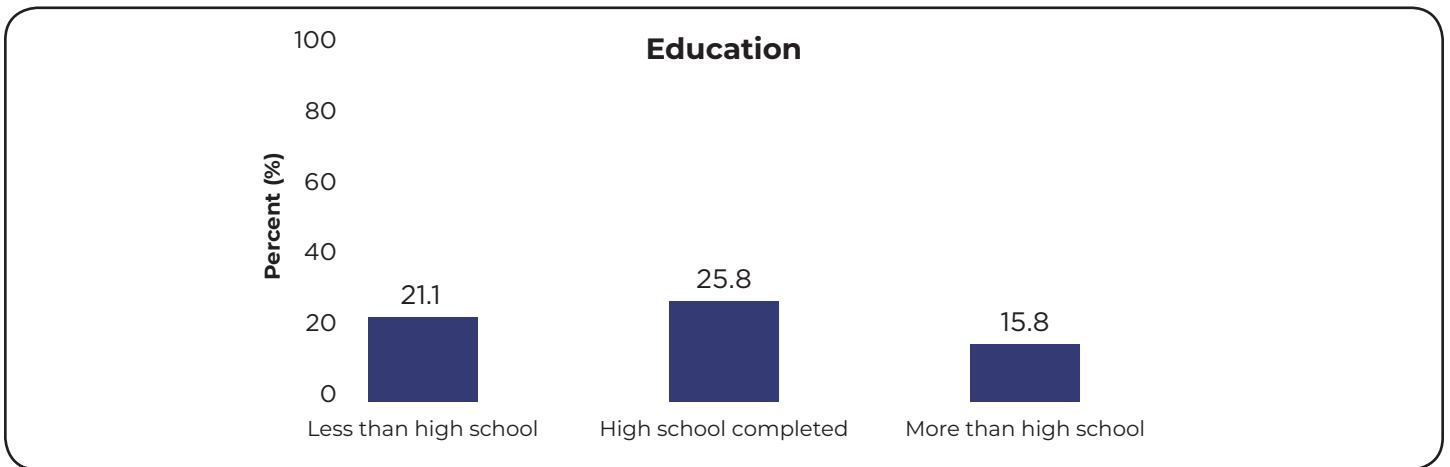
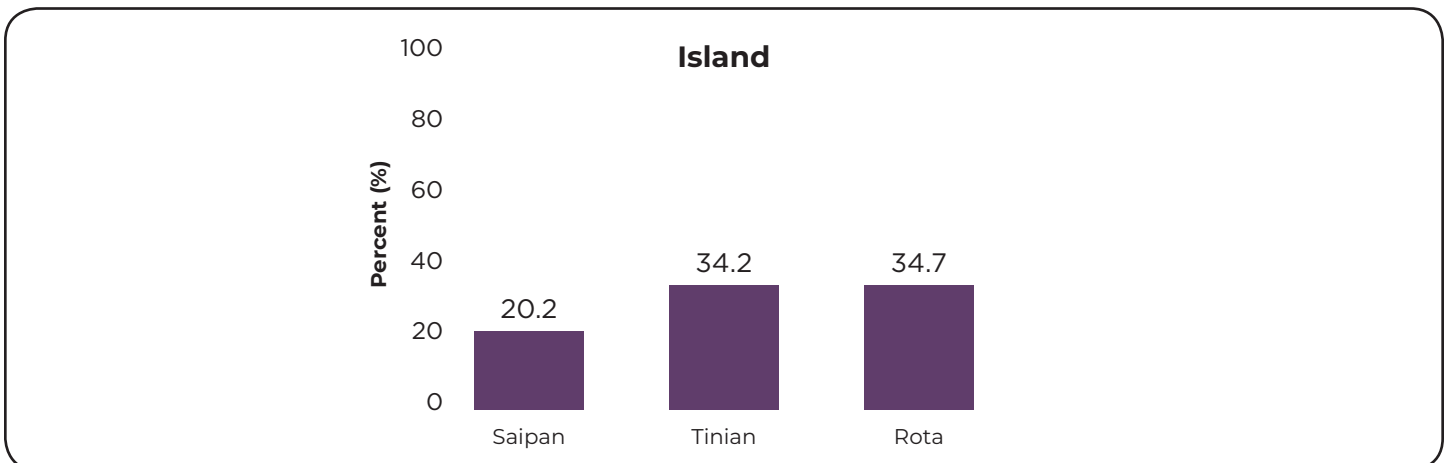


Figure 69. Percentage of Adults Currently Smoking, by Island, in the CNMI, 2023



Vaping

One out of ten (10%; 95%CI: 8.6%-11.5%) adults in the CNMI reported vaping in the past 30 days (current vaping). Among current vapers, 60.2% reported vaping every day in the past 30 days.

Vaping prevalence in the CNMI was significantly higher among men, younger adults (18-24yo), those who completed high school only, those residing in Tinian, and the Chamorro population.

Figure 70. Percentage of Adults Currently Vaping, by Ethnicity, in the CNMI, 2023

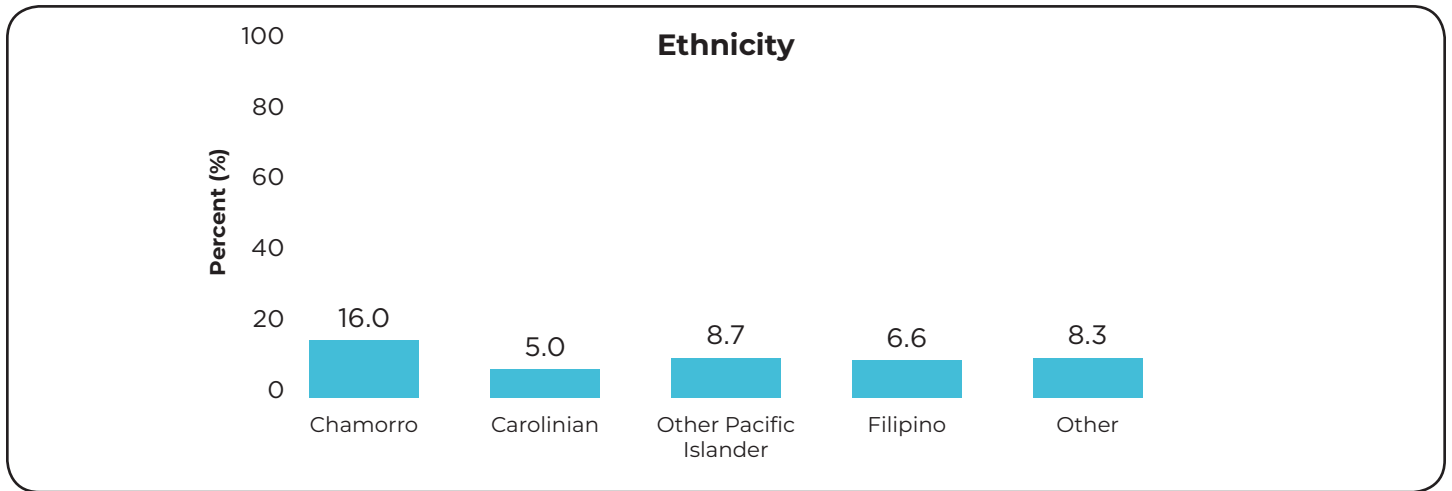
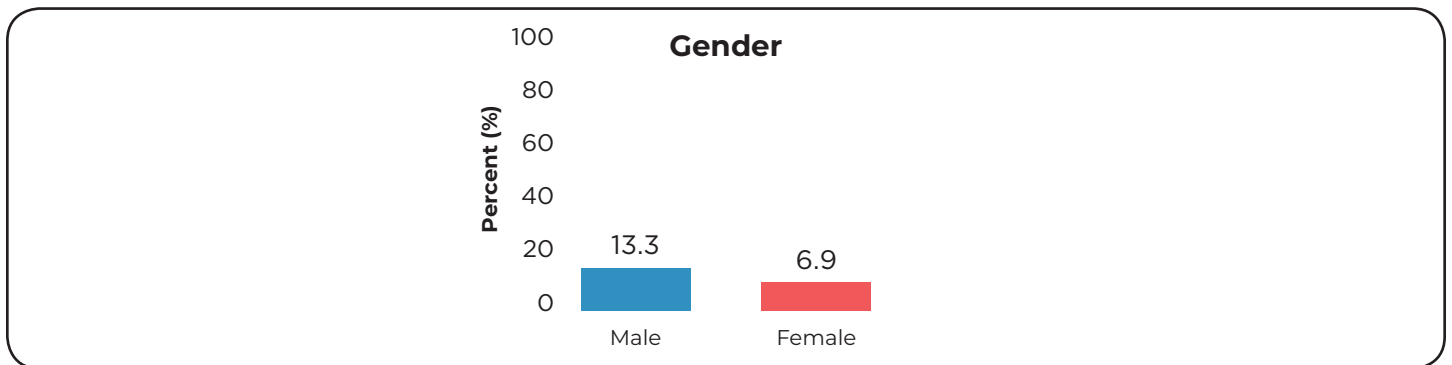


Figure 71. Percentage of Adults Currently Vaping, by Gender, in the CNMI, 2023



Vaping

Figure 72. Percentage of Adults Currently Vaping, by Age, in the CNMI, 2023

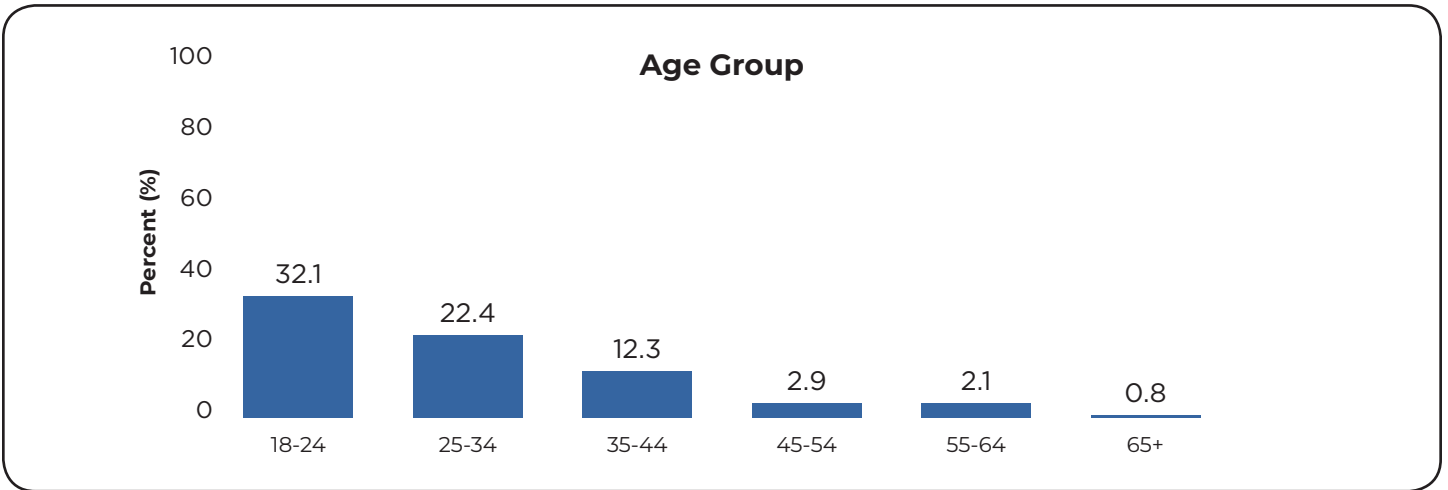


Figure 73. Percentage of Adults Currently Vaping, by Education, in the CNMI, 2023

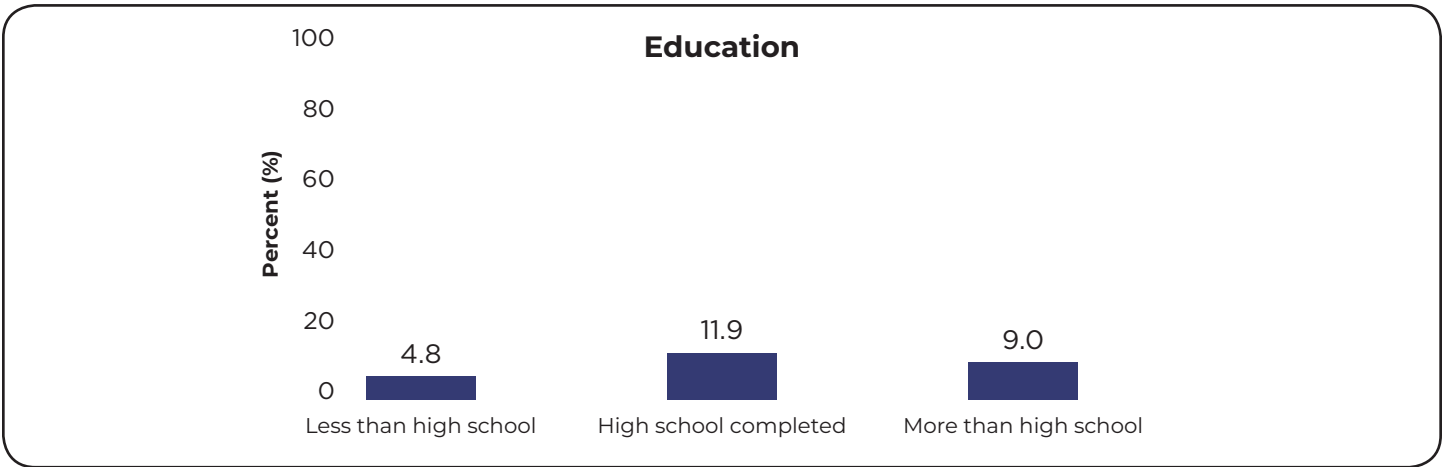
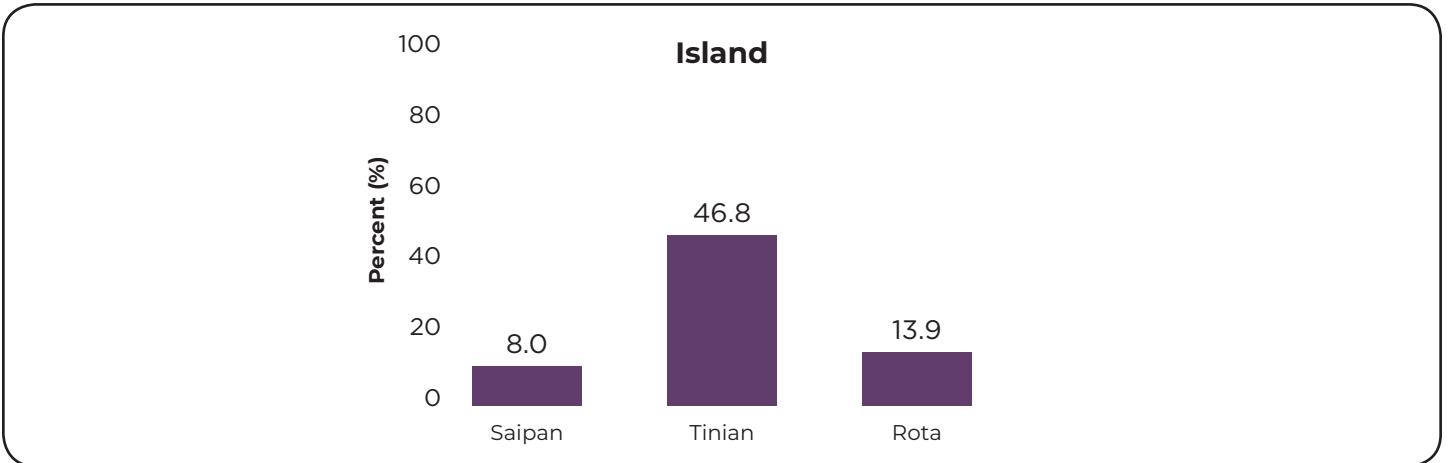


Figure 74. Percentage of Adults Currently Vaping, by Island, in the CNMI, 2023



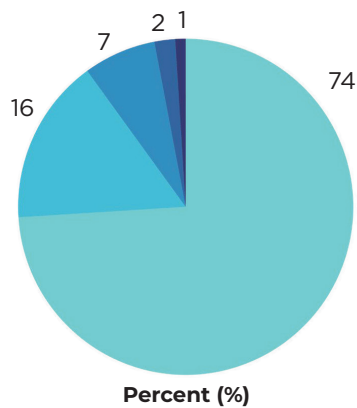
Betel Nut Chewing

About 1 out of 5 (22.5%; 95% CI: 19.5%-23.4%) adults in the CNMI reported chewing betel nut in the last 30 days (current chewing). Among current chewers, 72.4% reported chewing every day in the past 30 days. Among current every-day chewers, the average age of chewing initiation was 17 years old. Among current chewers, 68.5% reported that they want to quit chewing and 56.8% reported that they quit chewing for one day or more in the past year in an attempt to quit chewing.

Table 9. Betel nut chewing prevalence among adults in the CNMI, 2023

Current betel nut chewing prevalence (chewed in past 30 days)	22.5%
Percent of current betel nut chewers who chew every day	72.4%
Percent of current betel nut chewers who add tobacco to their chew	93.1%
Average age of initiation among current every-day chewers	17
Percent of current chewers who want to quit	68.5%
Percent of current chewers who have tried to quit in the past year	56.8%

Figure 75. Type of tobacco added to betel nut chew among current betel nut chewers in the CNMI, 2023



Among current chewers, 74% reported adding cigarette sticks to their chew, followed by imported loose tobacco, other types of tobacco, and locally grown tobacco. Only 7% did not add any tobacco to their chew. Among those chewers who add sticks of cigarettes to their chew, the average number of cigarettes chewed per day is 3 sticks.

Betel Nut Chewing

Betel nut chewing prevalence in the CNMI is significantly higher among adults 25-44 years old, those who with less than a high school education, those residing in Rota, and Carolinian, Chamorro, and Other Pacific Islander populations.

Figure 76. Percentage of Adults who chew Betel Nut, by Ethnicity, in the CNMI, 2023

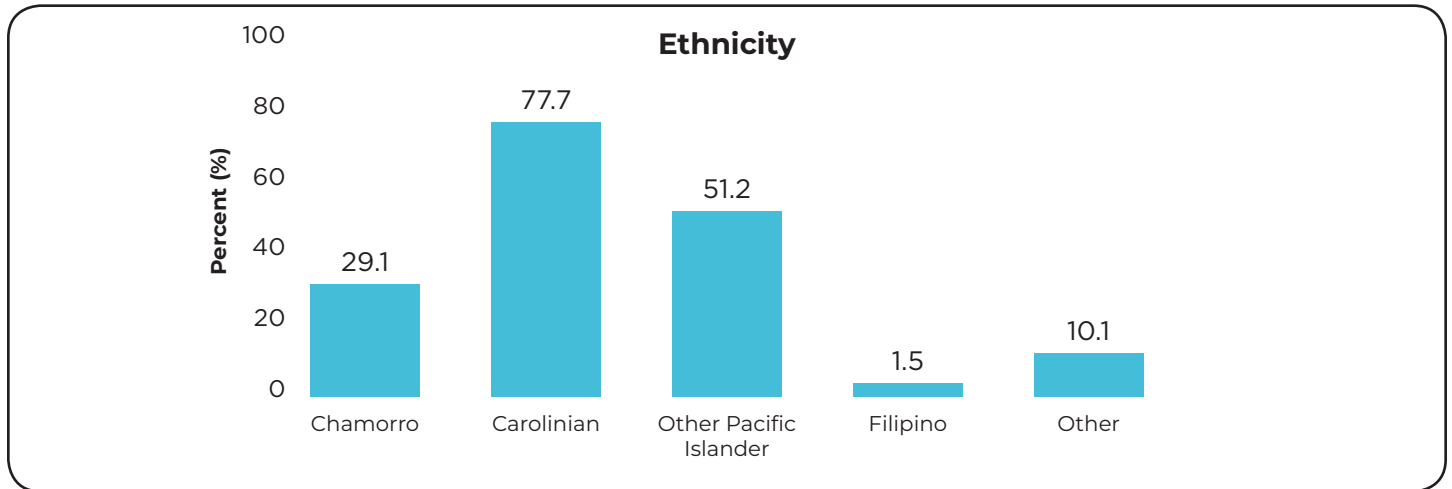
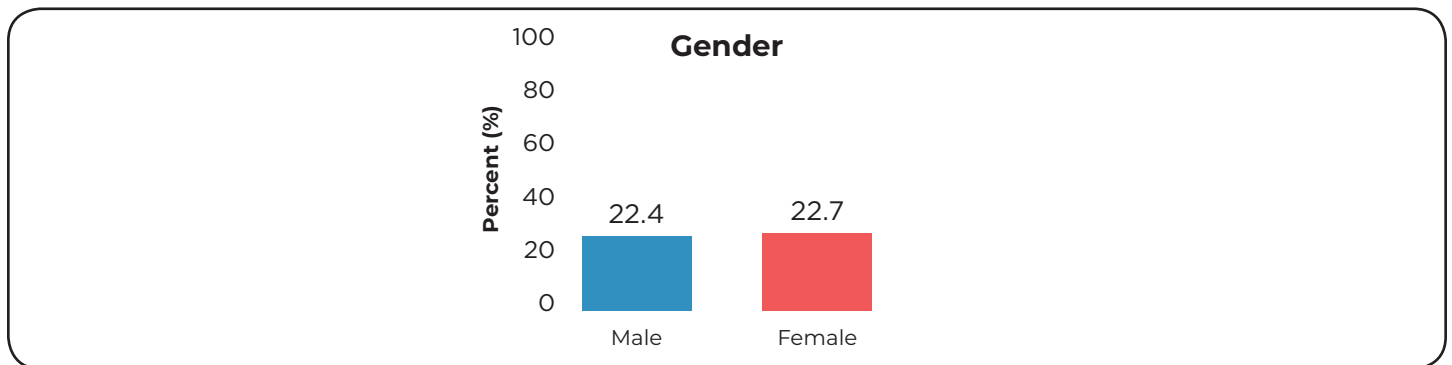


Figure 77. Percentage of Adults who chew Betel Nut, by Gender, in the CNMI, 2023



Betel Nut Chewing

Figure 78. Percentage of Adults who chew Betel Nut, by Age, in the CNMI, 2023

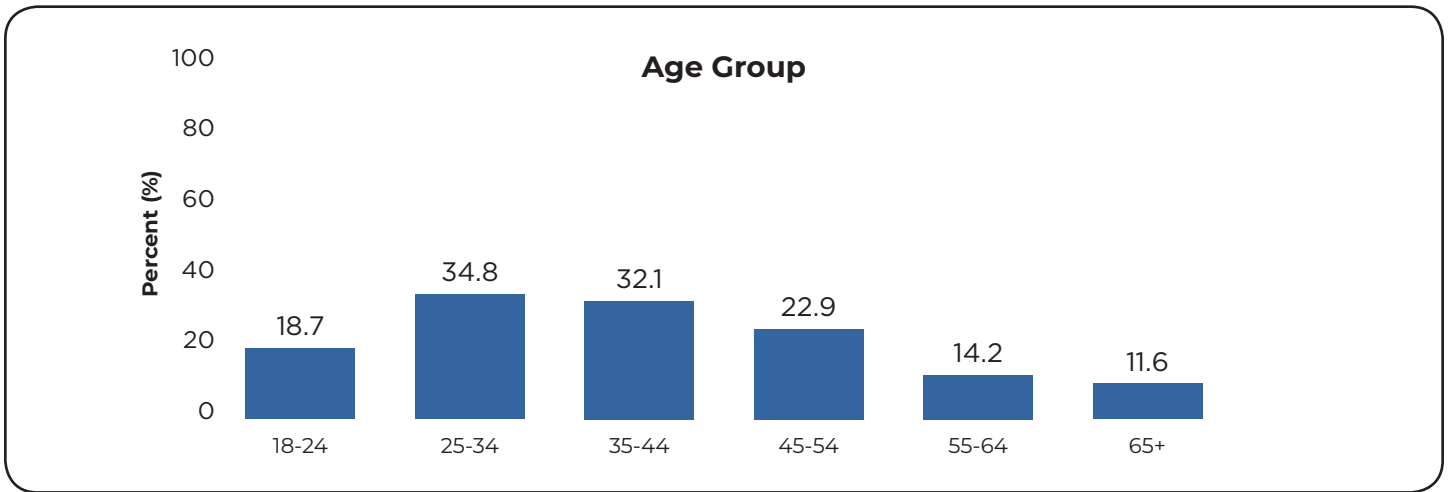


Figure 79. Percentage of Adults who chew Betel Nut, by Education, in the CNMI, 2023

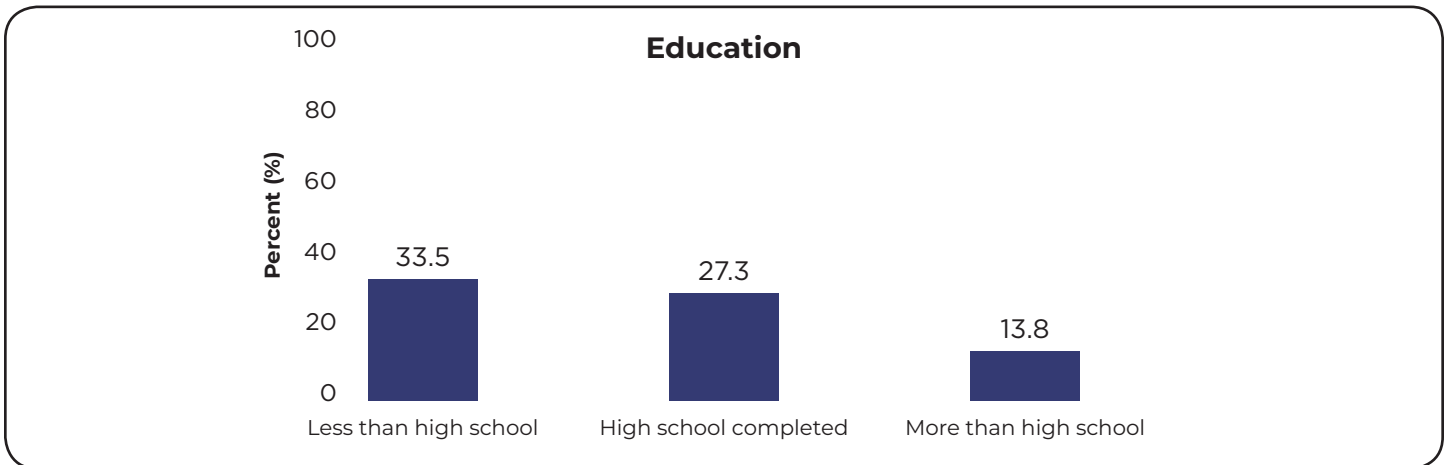
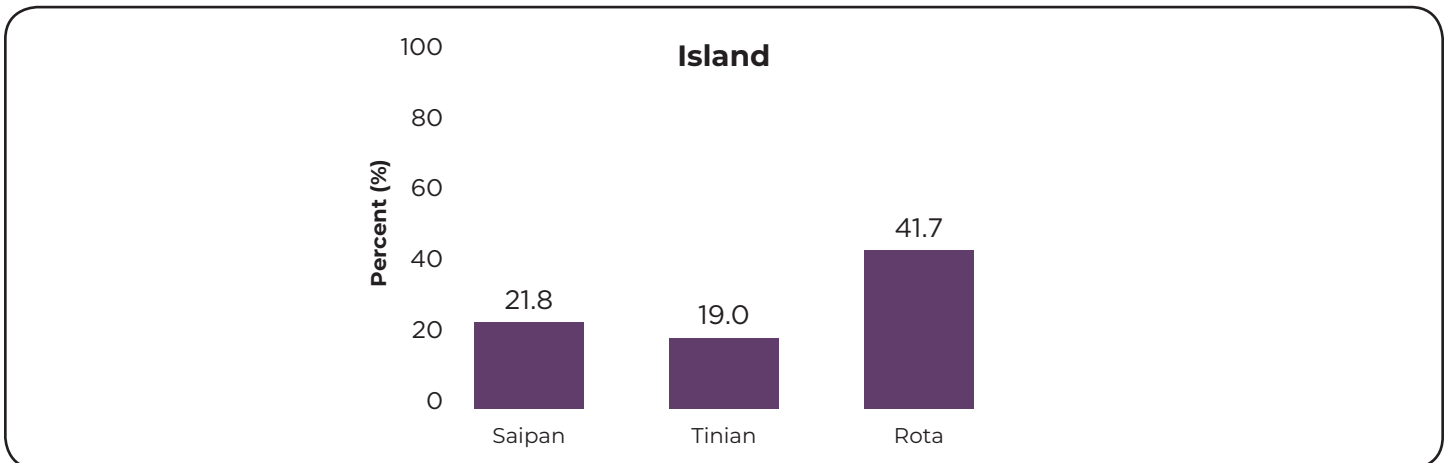


Figure 80. Percentage of Adults who chew Betel Nut, by Island, in the CNMI, 2023



Alcohol Use and Binge Drinking

About 2 out of 5 (42.5%; 95% CI: 40.2%-44.9%) adults in the CNMI reported using alcohol in the last 30 days (current alcohol use). About one out of three (28.2%; 95% CI: 26.1%-30.3%) adults in the CNMI reported binge drinking in the past 30 days (current binge drinking). Therefore, 66.0% of the adults in the CNMI who reported alcohol use in the past 30 days binge drank in the past 30 days.

The average age of first drink among current alcohol users is 20 years old. The average number of drinks per day consumed among current alcohol users is 6. The average number of days current alcohol users consumed alcohol in the past 30 days is 7.

Table 10. Alcohol use prevalence among adults in the CNMI, 2023

Current alcohol use prevalence (alcohol use in past 30 days)	42.5%
Current binge drinking (drinking 5+ standard drinks [men] / 4+ standard drinks [women] on one occasion) in the past 30 days	28.2%
Average age of first drink among current alcohol users	20
Average number of drinks per day consumed among current alcohol users	6
Average number of days current alcohol users consumed alcohol in the past 30 days	7

Alcohol Use and Binge Drinking

Binge drinking prevalence in the CNMI is higher among those 25-44 years old, men, those with a high school education only, those residing in Tinian and Rota, and Chamorro, Carolinian, and Other Pacific Islander populations.

Figure 81. Percentage of Adults who Binge Drink, by Ethnicity, in the CNMI, 2023

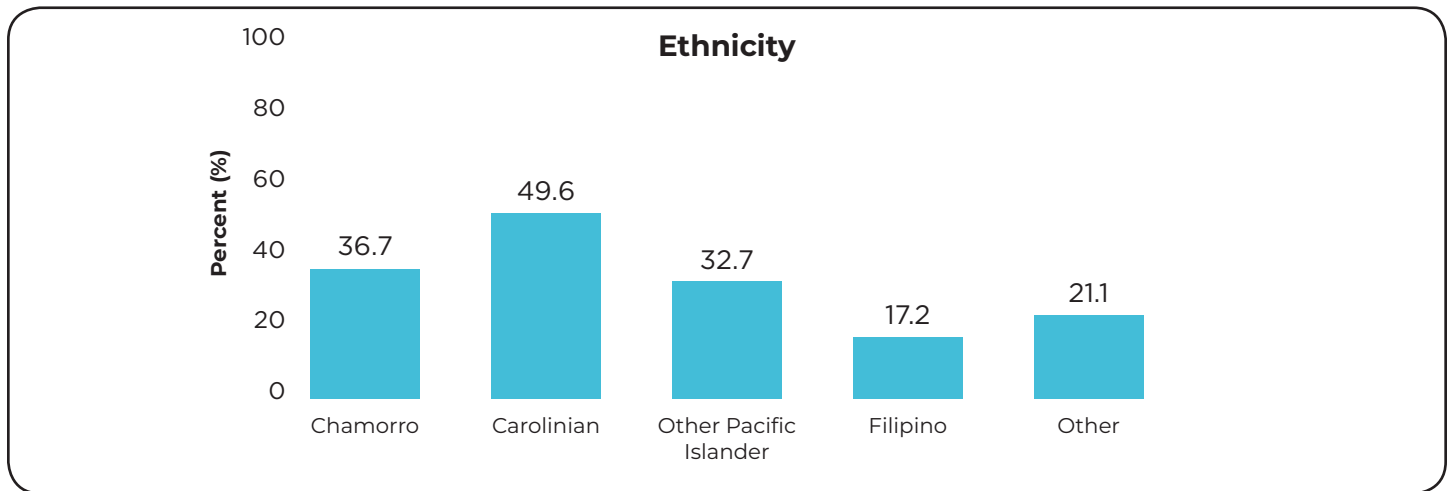
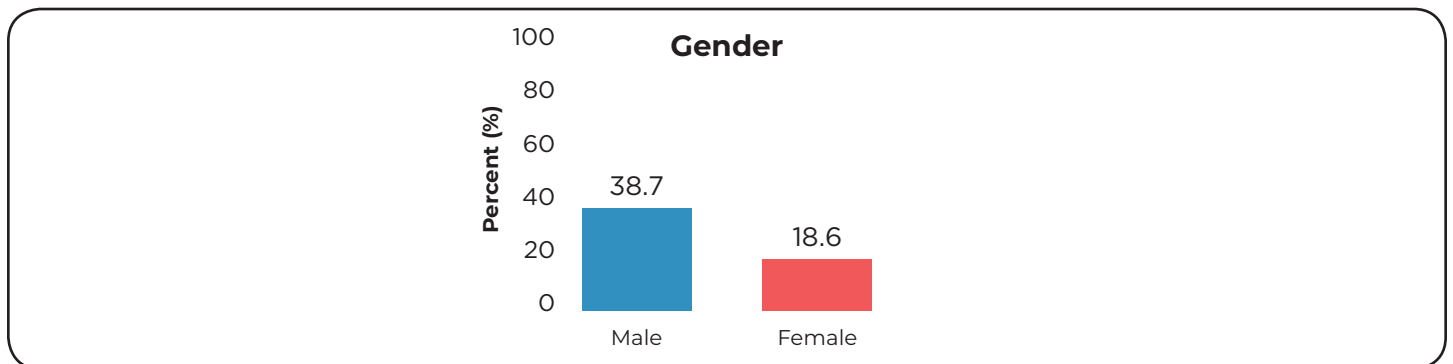


Figure 82. Percentage of Adults who Binge Drink, by Gender, in the CNMI, 2023



Alcohol Use and Binge Drinking

Figure 83. Percentage of Adults who Binge Drink, by Age, in the CNMI, 2023

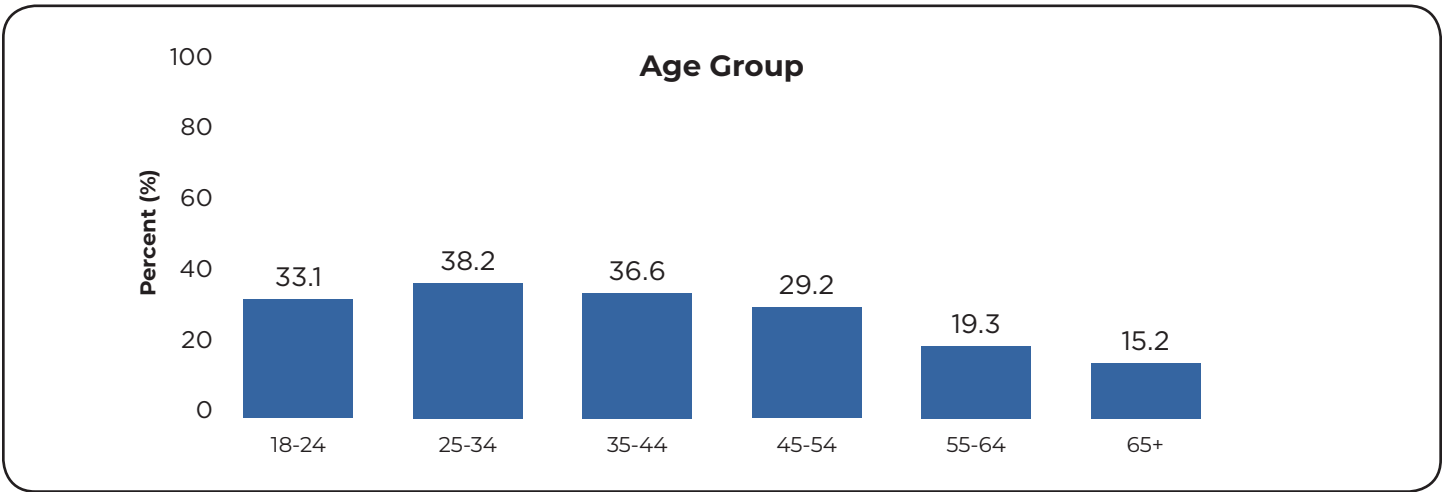


Figure 84. Percentage of Adults who Binge Drink, by Education, in the CNMI, 2023

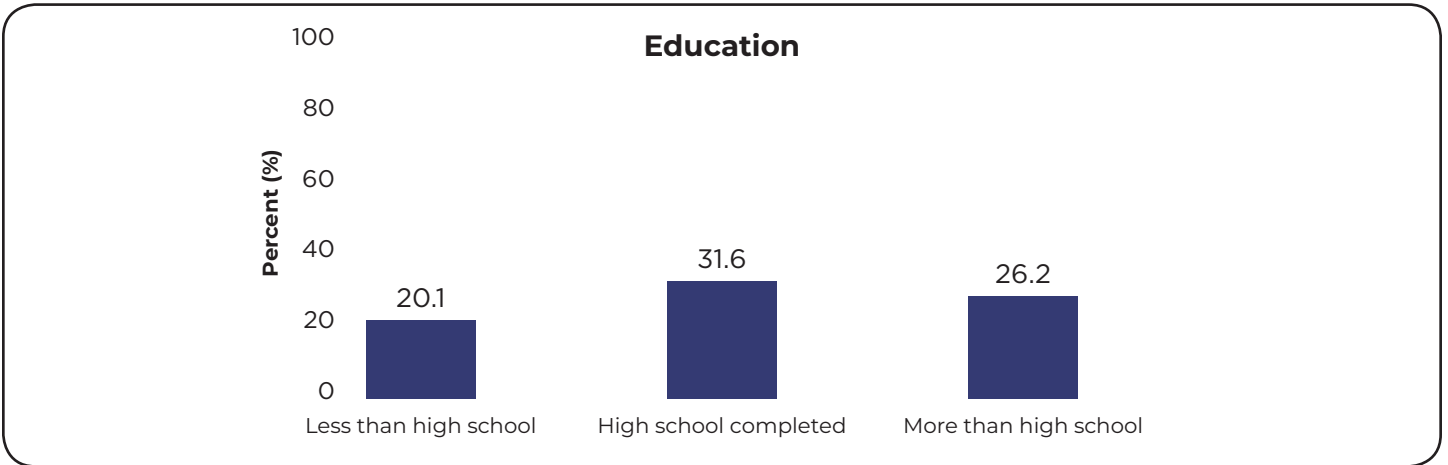
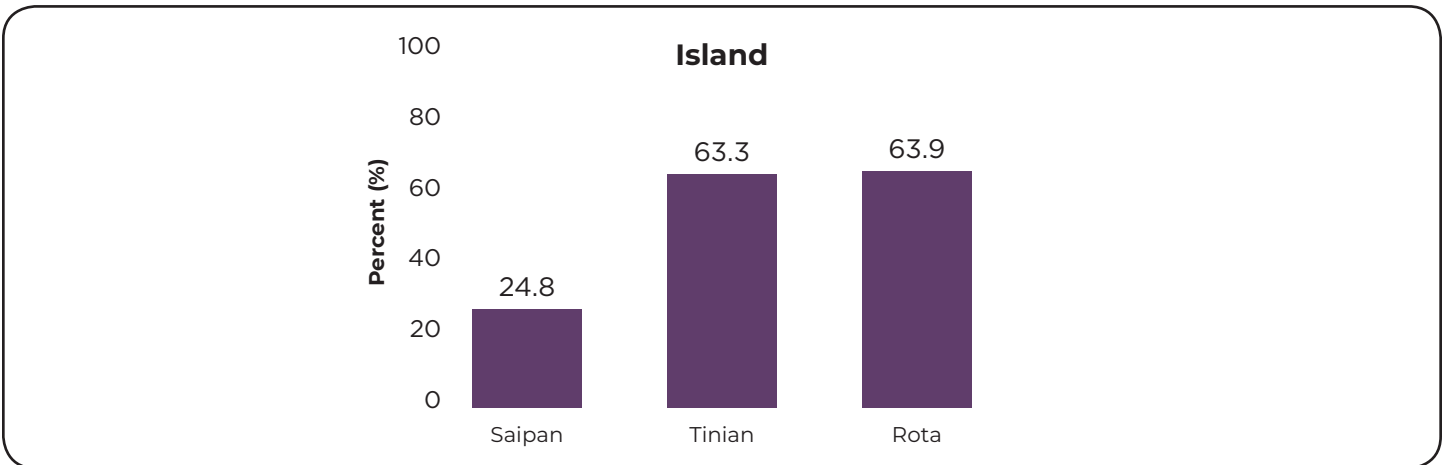


Figure 85. Percentage of Adults who Binge Drink, by Island, in the CNMI, 2023



Marijuana Use

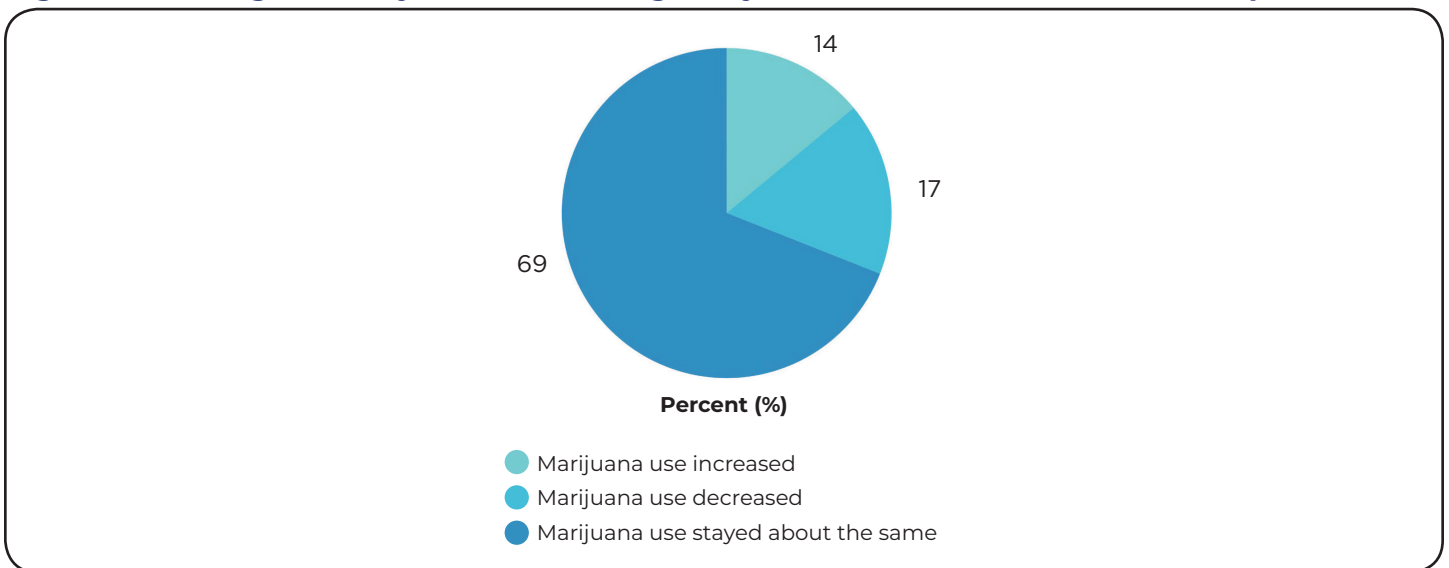
About 1 out of 6 (16.1%; 95% CI: 14.4%-17.9%) adults in the CNMI reported using marijuana in the last 30 days (current marijuana use). Among current marijuana users, 43.7% reported using marijuana every day. The average age of first marijuana use among current users is 20 years old.

Table 11. Marijuana use prevalence among adults in the CNMI, 2023

Current marijuana use prevalence (marijuana use in past 30 days)	16.1%
% of current marijuana users who use marijuana every day	43.7%
Average age of first use among current marijuana users	20

Among current marijuana users, the majority (69%) reported that their marijuana use stayed about the same after Law 20-66 was passed. In 2018, CNMI Public Law legalized marijuana use for recreational, medicinal, and commercial use.

Figure 86. Change in Marijuana Use among Marijuana Users after Law 20-66 was passed



Marijuana Use

Marijuana use prevalence in the CNMI is higher among men, adults 18-24 years old, those with a high school education, those residing in Tinian and Rota, and Chamorro, Carolinian, and Other Pacific Islander populations.

Figure 87. Marijuana Use, by Ethnicity, in the CNMI, 2023

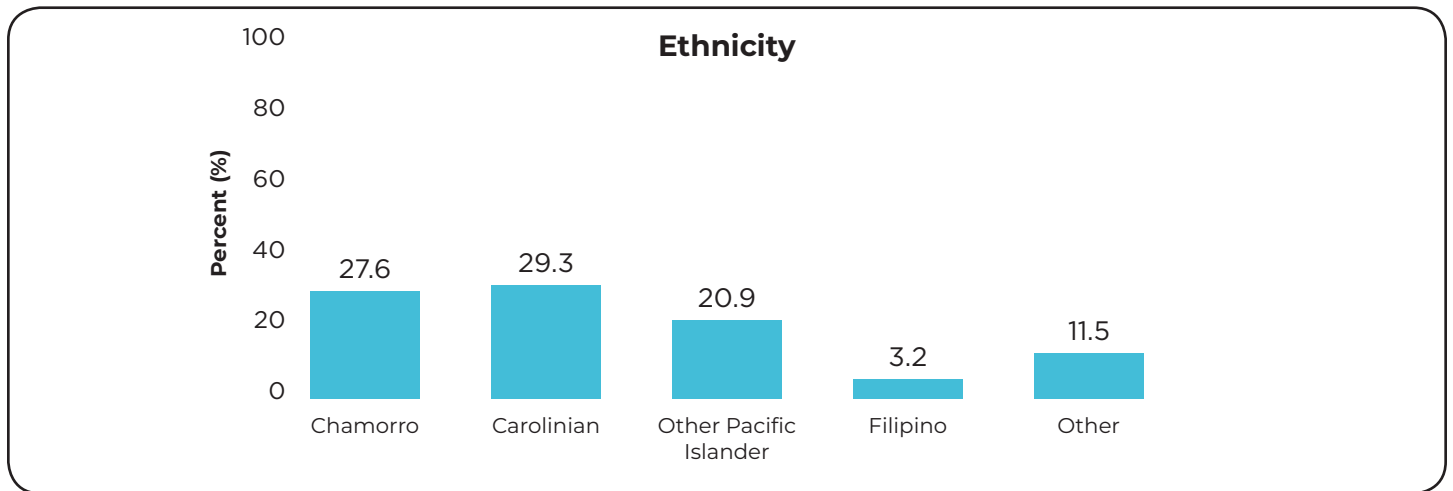
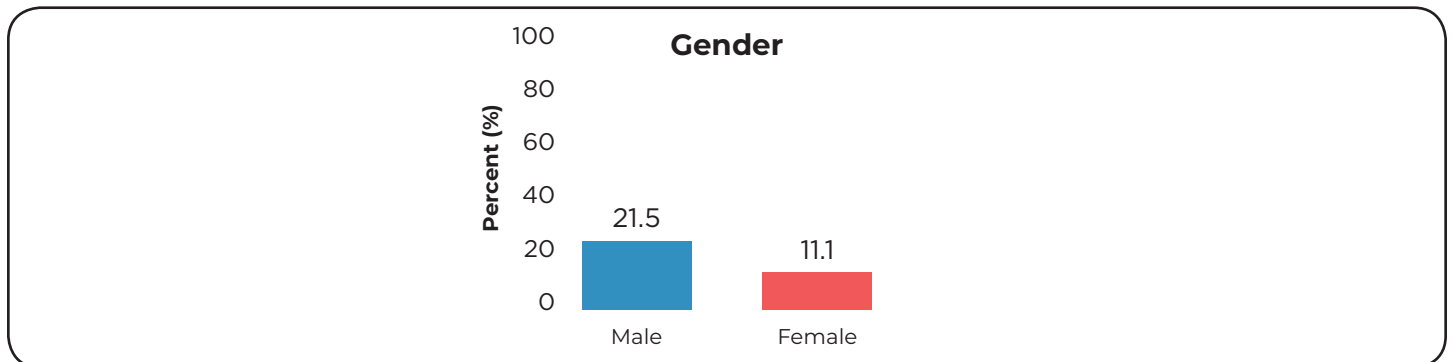


Figure 88. Marijuana Use, by Gender, in the CNMI, 2023



Marijuana Use

Figure 89. Marijuana Use, by Age, in the CNMI, 2023

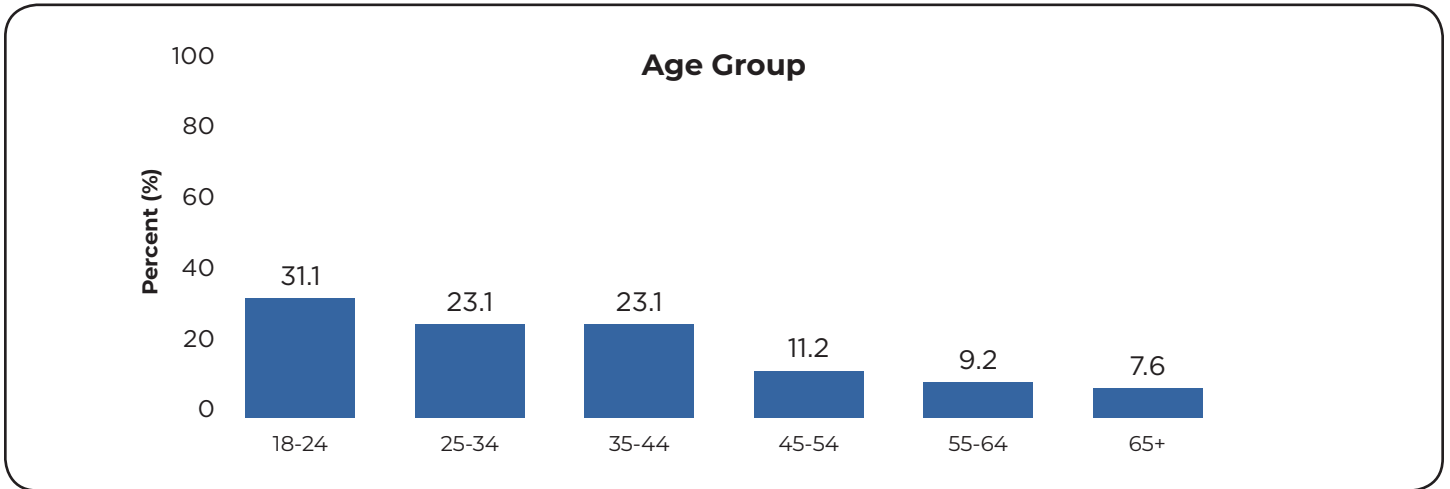


Figure 90. Marijuana Use, by Education, in the CNMI, 2023

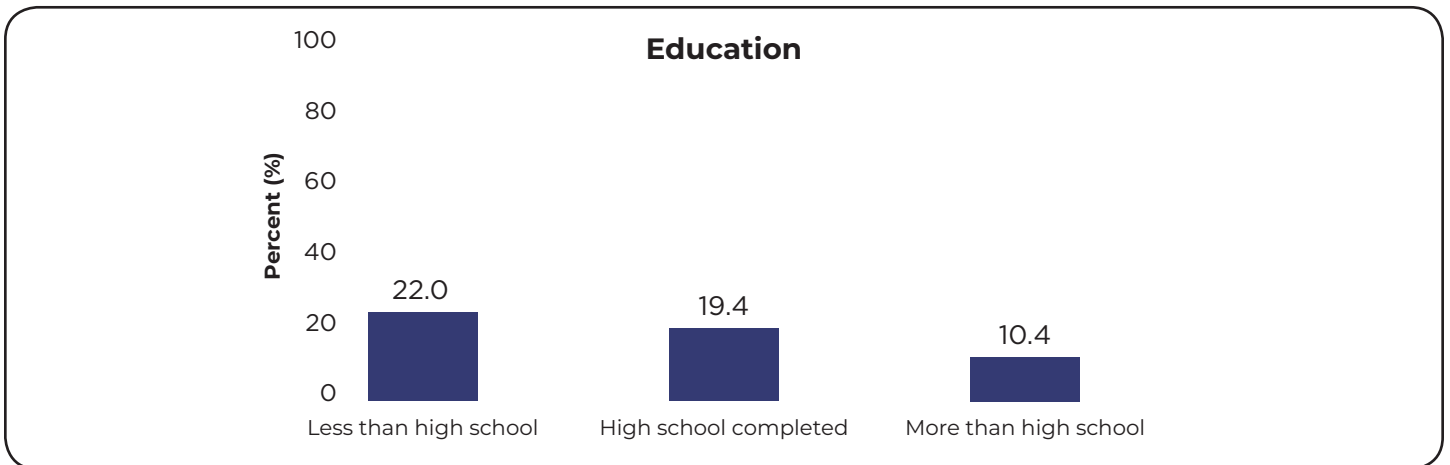
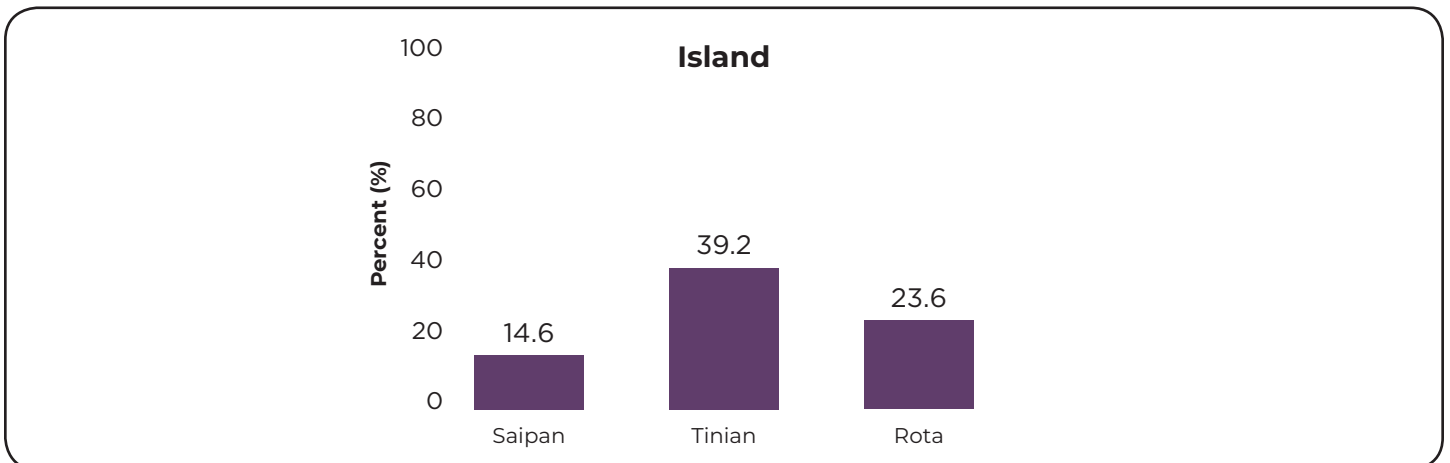


Figure 91. Marijuana Use, by Island, in the CNMI, 2023



Other Substance Use

Among other substances used by adults in the CNMI, heroin, crack, cocaine, or methamphetamine use was the most reported, with 0.8% reporting current use. The average age of first use reported among current users was 28 years. There was reported use of opioids without doctor's orders among 0.6% of adults, and average age of first use among these adults was 52 years.

Table 12. Other substance use prevalence among adults in the CNMI, 2023

Current use (in past 30 days) of heroin, crack, cocaine, or methamphetamine	0.8%
Average age of first use among current heroin, crack, cocaine, or methamphetamine users	28
Current use (in past 30 days) of hallucinogens such as LSD, ecstasy, PCP, or peyote	0.3%
Average age of first use among current hallucinogen	28
Current use (in past 30 days) of inhalants or sniffed/huffed substances	0.0%
Current use (in past 30 days) of prescription drugs without doctor's orders to feel good or get high	0.3%
Average age of first use among current prescription drug users	35
Current use (in past 30 days) of opioids (pain killers like Oxycodone, Methadone, Tramadol, or Morphine) to remove the pain without doctor's orders	0.6%
Average age of first use among current opioid users	52
Percent of opioid users who acquired opioids from anyone other than a doctor	44.4%

About 2 in 5 adults in the CNMI have communicated with family (44.6%) or other individuals (40.3%) about the dangers of tobacco, alcohol, or other drugs in the past 12 months. Also, 18.4% of adults reported driving under the influence in the past 12 months, and 24.4% of adults reported being a passenger with a driver under the influence in the past 12 months.

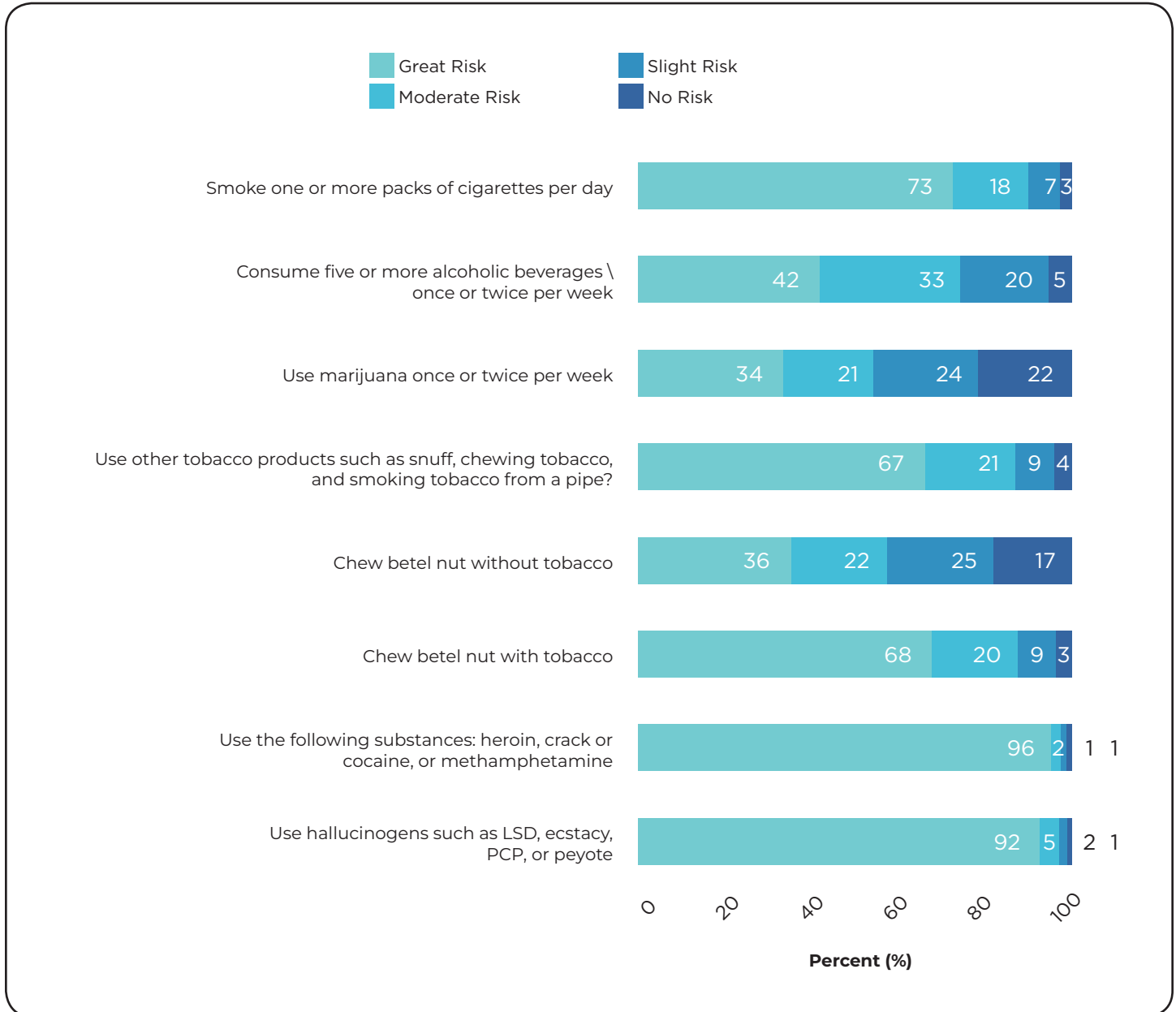
Table 13. Substance use risk communication and behavior statistics among adults in the CNMI, 2023

During the past 12 months, did you talk to anyone in your family (adults, your children, other children) about the dangers or problems associated with the use of tobacco, alcohol, or other drugs?	44.6%
During the past 12 months, did you talk to anyone, other than a family member, about the dangers or problems associated with the use of tobacco, alcohol, or other drugs?	40.3%
During the past 12 months, have you driven a vehicle while you were under the influence of alcohol or drugs?	18.4%
During the past 12 months, have you been a passenger in a vehicle with a driver under the influence of alcohol or drugs?	24.4%

Perception of Substance Risk

Survey participants were asked to evaluate risk of certain substances. Illicit substances were perceived as most risky, followed by cigarette smoking and other tobacco use. Chewing betel nut without tobacco, binge drinking, and using marijuana were perceived as least risky.

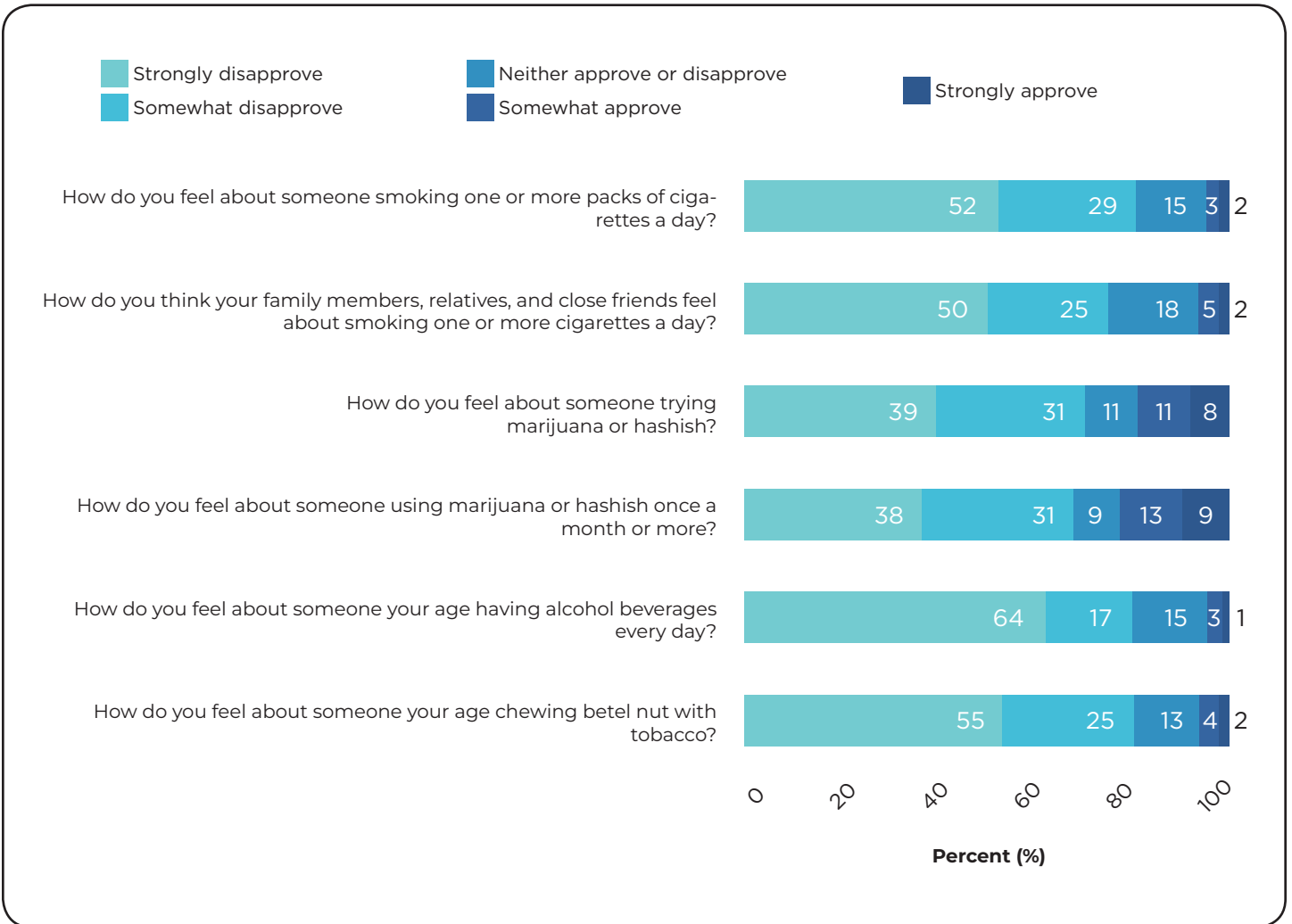
Figure 92. How much do people risk harming themselves physically and in other ways when then they use...



Disapproval of Substance Use

Survey participants were asked to assess disapproval of certain substances. There was highest disapproval of chewing betel nut with tobacco and drinking alcohol every day, followed by smoking cigarettes, and using marijuana.

Figure 93. Perception of Substance Use among adults in the CNMI, 2023



Mental Health: Depression

Survey participants were asked questions regarding their mental health status. Overall, 4.1% (95% CI: 3.2%-5.1%) of adults reported signs of depression. Depression was screened using an adaptation of the Patient Health Questionnaire 2 (PHQ-2). The only statistically significant difference by demographics is the increased prevalence in depression among Chamorro, Carolinian, and other Pacific Islander populations in the CNMI.

Figure 94. Depression, by Ethnicity, in the CNMI, 2023

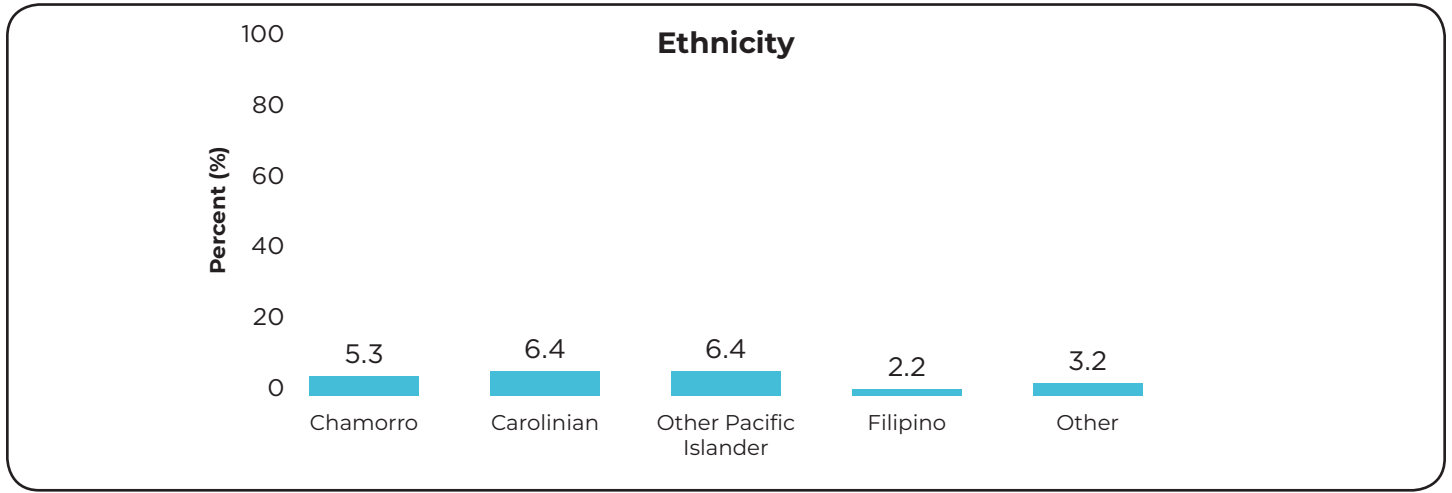
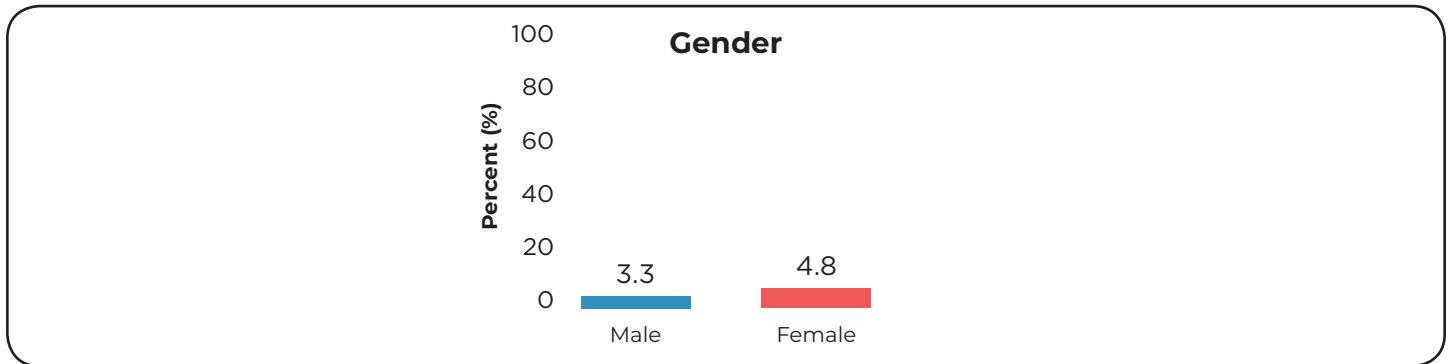


Figure 95. Depression, by Gender, in the CNMI, 2023



Mental Health: Depression

Figure 96. Depression, by Age, in the CNMI, 2023

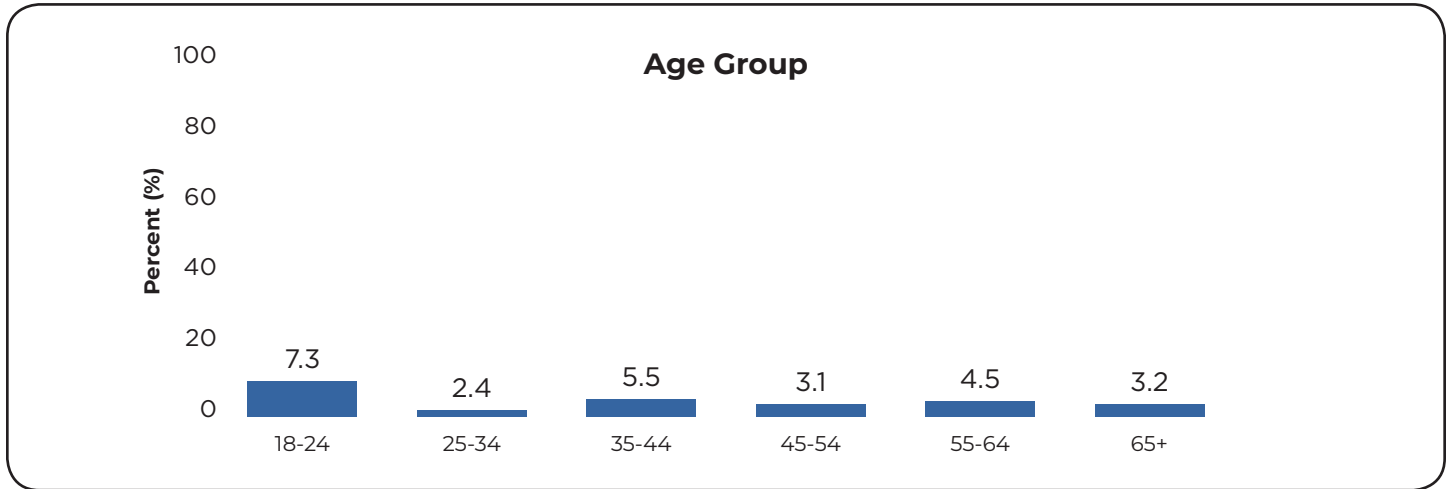


Figure 97. Depression, by Education, in the CNMI, 2023

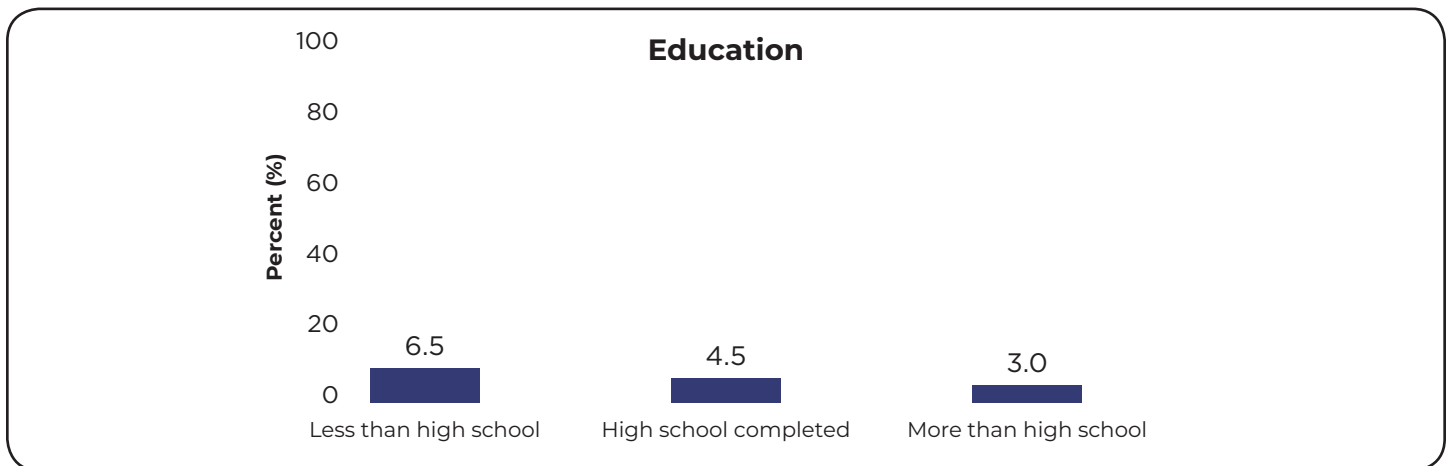
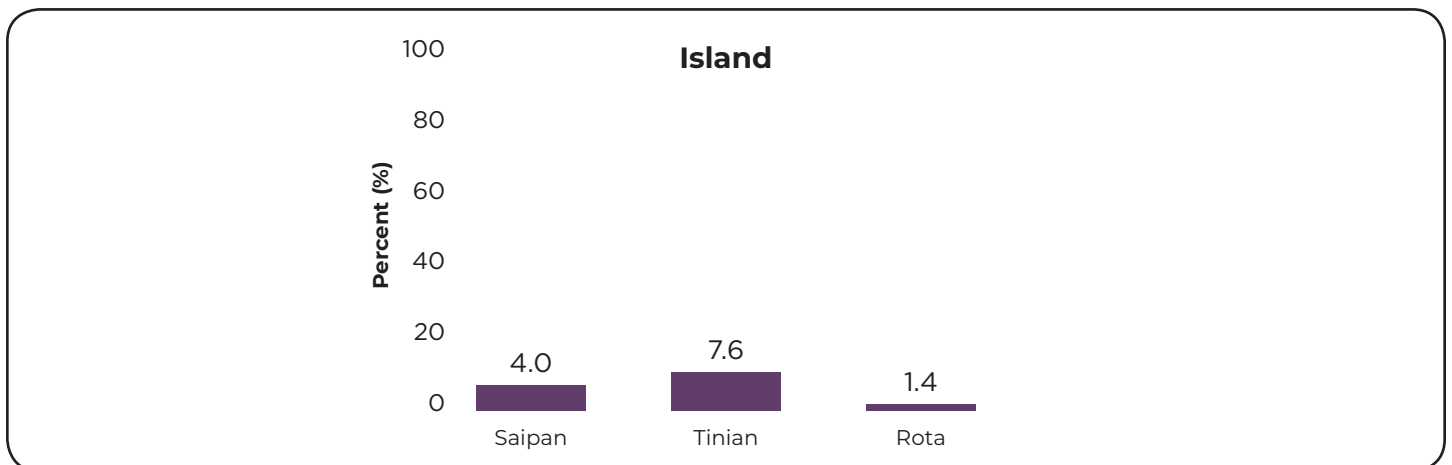


Figure 98. Depression, by Island, in the CNMI, 2023



Mental Health: Anxiety

Overall, 12.2% (95%CI: 10.7%-13.8%) of adults in the CNMI reported signs of anxiety. Anxiety was screened using an adaptation of the Generalized Anxiety Disorder 2 (GAD-2). Anxiety prevalence was significantly higher among those residing in Tinian, adults 18-24 years old, and Chamorro, Carolinian, and other Pacific Islander populations.

Figure 99. Anxiety, by Ethnicity, in the CNMI, 2023

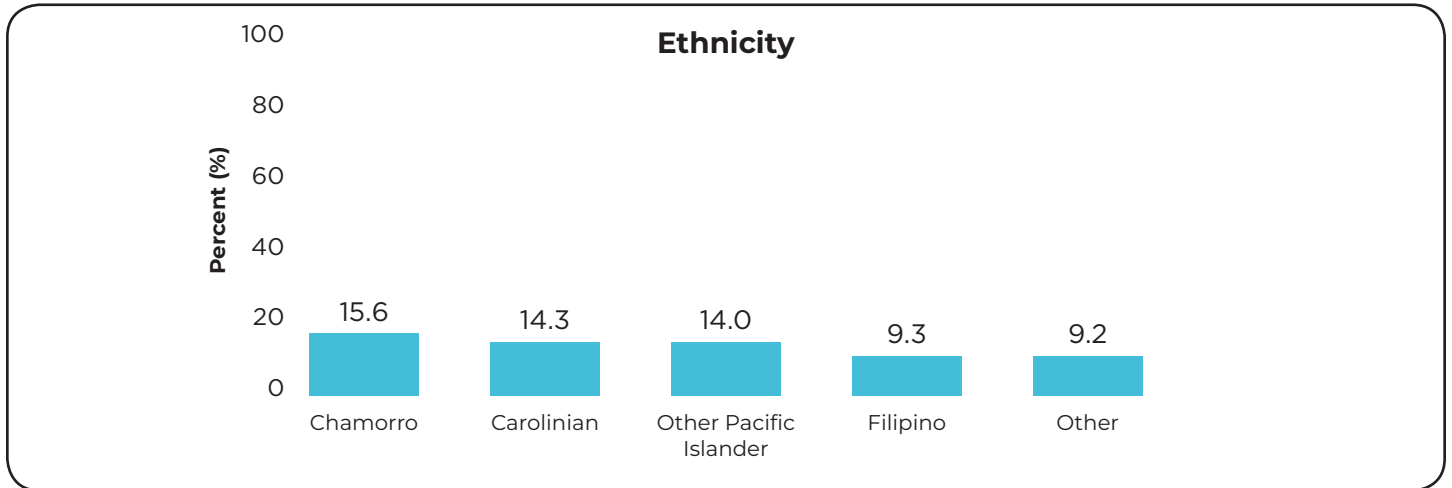
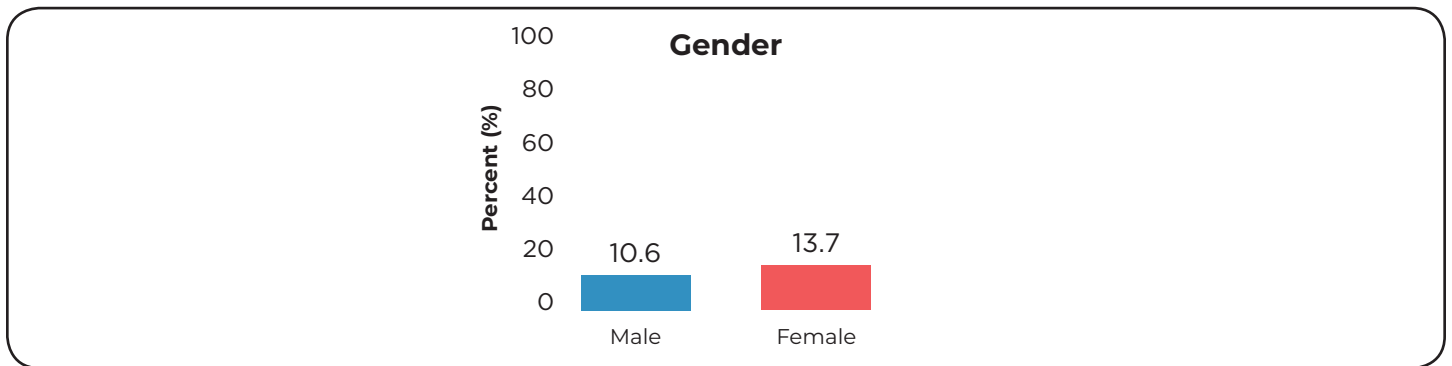


Figure 100. Anxiety, by Gender, in the CNMI, 2023



Mental Health: Anxiety

Figure 101. Anxiety, by Age, in the CNMI, 2023

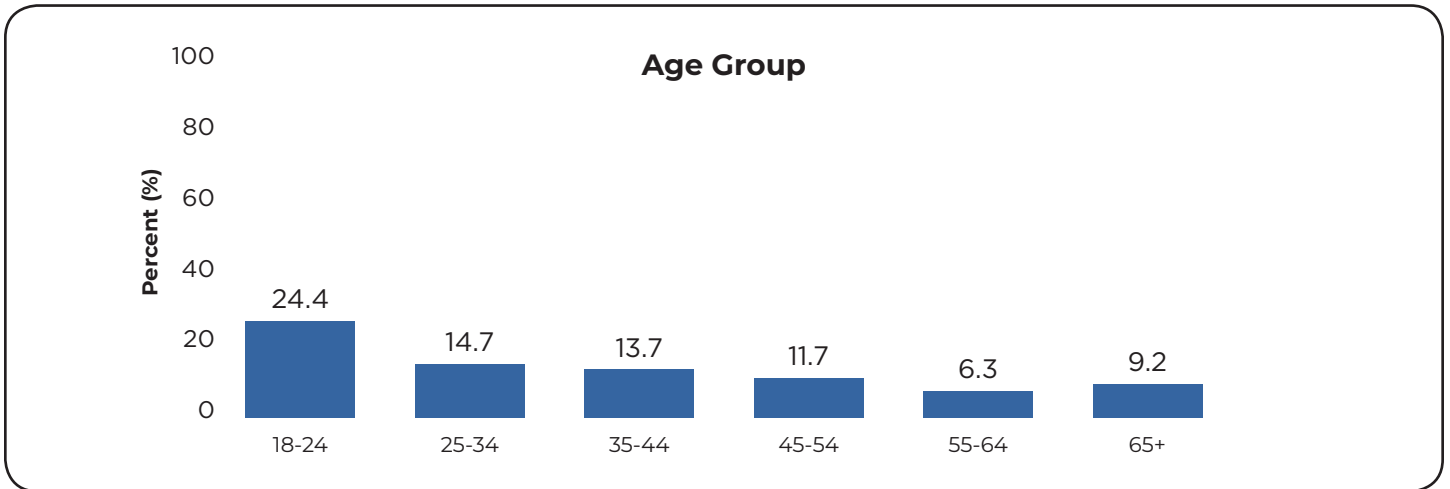


Figure 102. Anxiety, by Education, in the CNMI, 2023

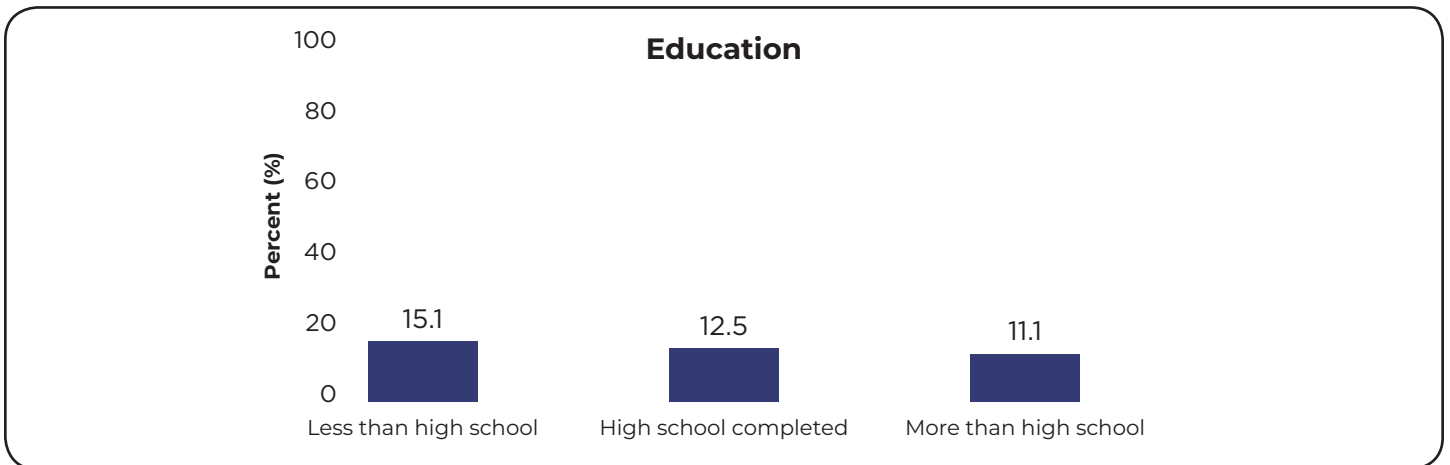
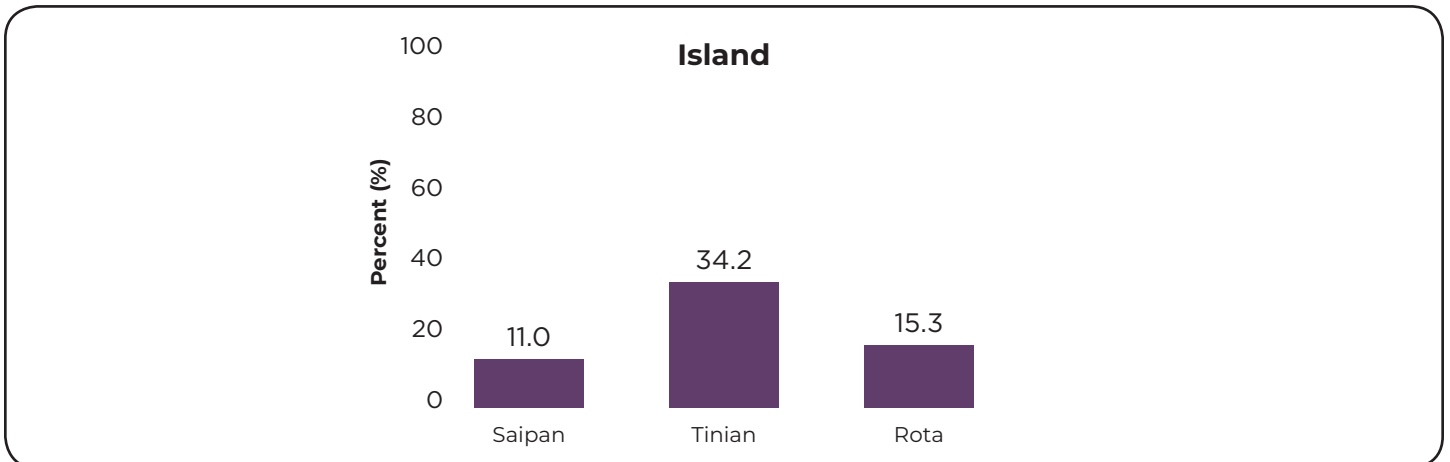


Figure 103. Anxiety, by Island, in the CNMI, 2023



Mental Health: Mental Illness

Among adults in the CNMI, 3.5% reported taking medicine or receiving treatment from a doctor or other health professional, and 0.6% reported taking medicine or receiving treatment from a local healer or a cultural health professional for any type of mental health condition or emotional problem. Additionally, 17.6% of adults reported that a mental health condition or emotional problem kept them from doing their work or other usual activities 1 or more days out of the past 30 days.

The majority of adults in the CNMI agree that treatment can help people with mental illness lead normal lives and people are generally sympathetic to people with mental illness (88.8% and 75.9%, respectively)

Table 14. Use of medication or treatment related to a mental health condition or emotional problem prevalence among adults in the CNMI, 2023

Percent of adults taking medicine or receiving treatment from a doctor or other health professional from any type of mental health condition or emotional problem	3.5%
Percent of adults taking medicine or receiving treatment from a local healer or a cultural health professional for any type of mental health condition or emotional health problems	0.6%

Figure 104. During the past 30 days, for about how many days did a mental health condition or emotional problem keep you from doing your work or other usual activities?

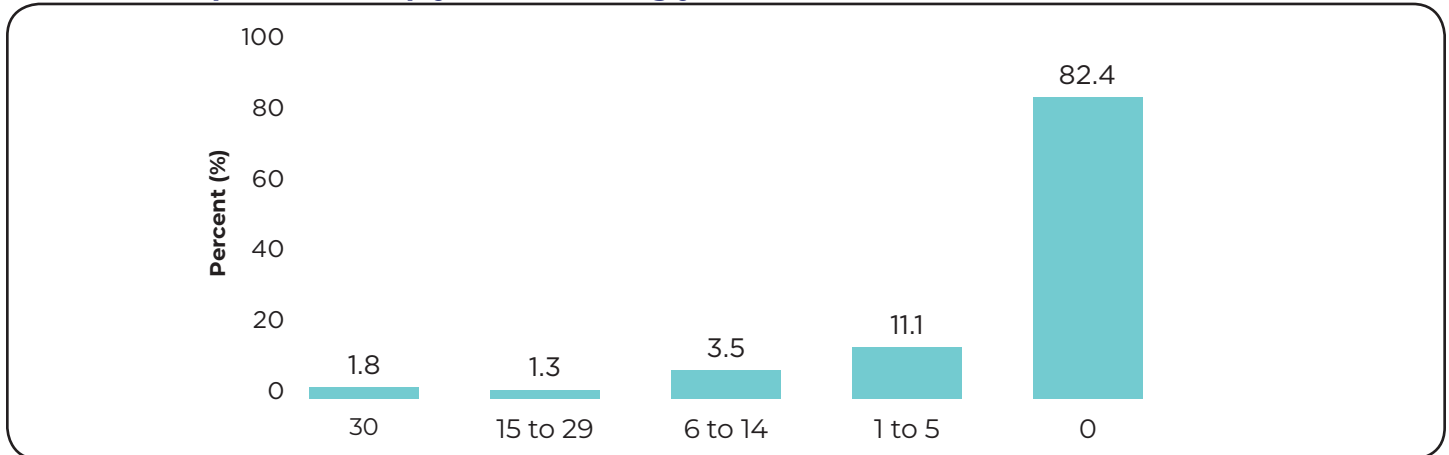


Figure 105. Treatment can help people with mental illness lead normal lives

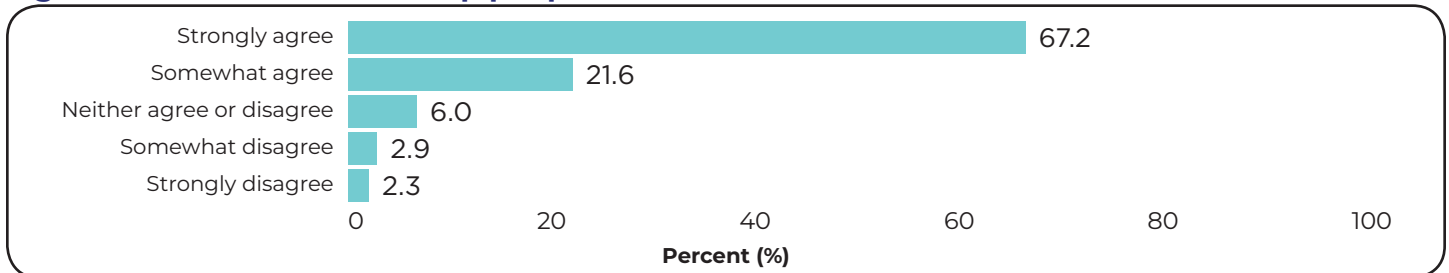
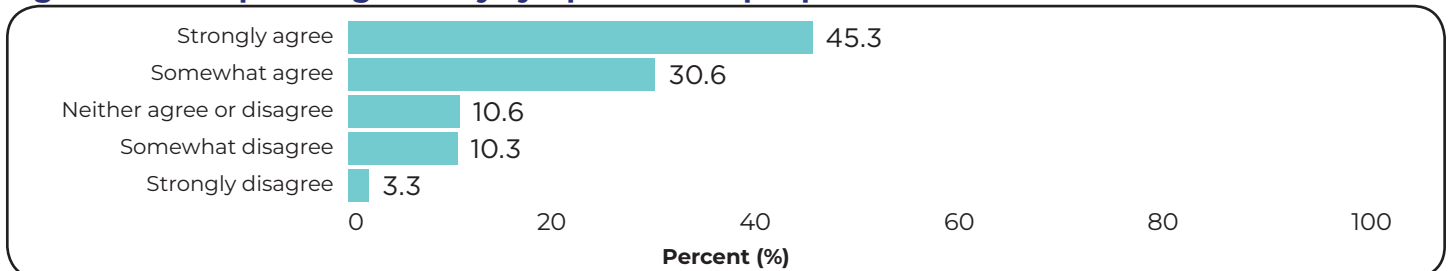


Figure 106. People are generally sympathetic to people with mental illness



Mental Health: Suicide

Among adults in the CNMI, 16.0% reported ever thinking about killing themselves, 6.8% reported ever making plans to kill themselves, and 4.7% reported trying to kill themselves. Suicide ideation (thinking about, making plans, or attempting suicide) was highest among women, younger adults (18-24 years old), those residing in Tinian, and Chamorro, Carolinian, and other Pacific Islander populations.

Table 15. Suicide ideation prevalence among adults in the CNMI, 2023

Ever thought about killing yourself	16.0%
Ever made plans to kill yourself	6.8%
Ever tried to kill yourself	4.7%

Figure 107. Suicide Ideation, by Ethnicity, in the CNMI, 2023

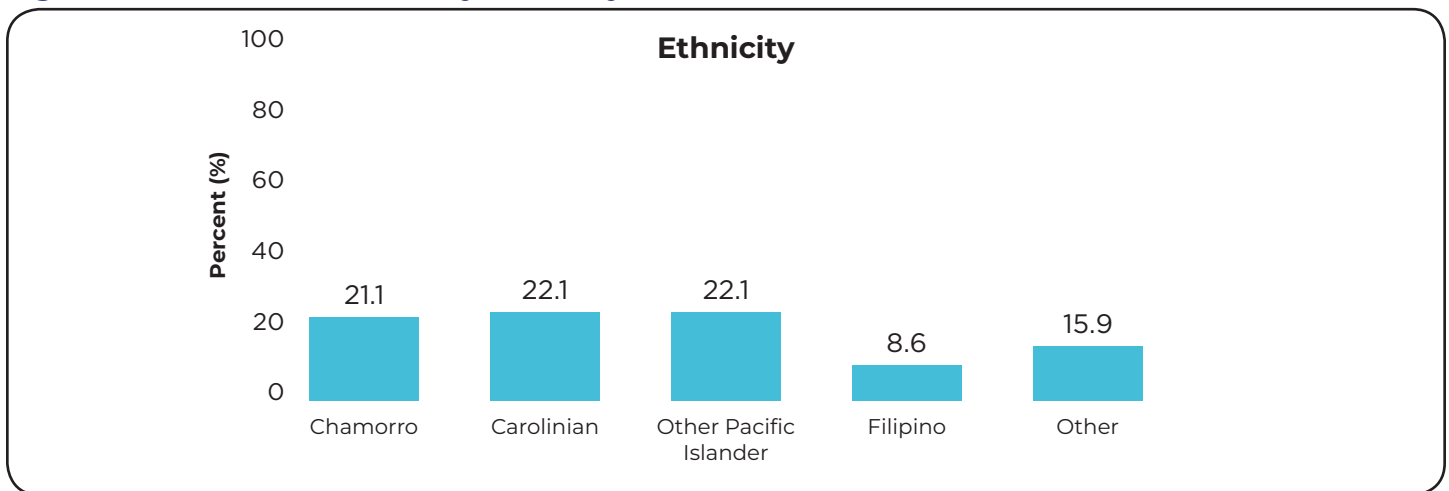
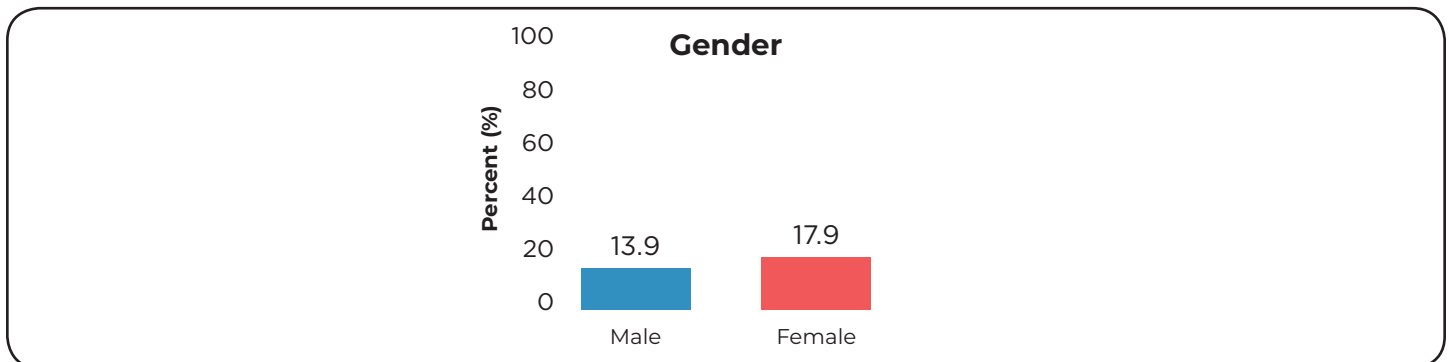


Figure 108. Suicide Ideation, by Gender, in the CNMI, 2023



Mental Health: Suicide

Figure 109. Suicide Ideation, by Age, in the CNMI, 2023

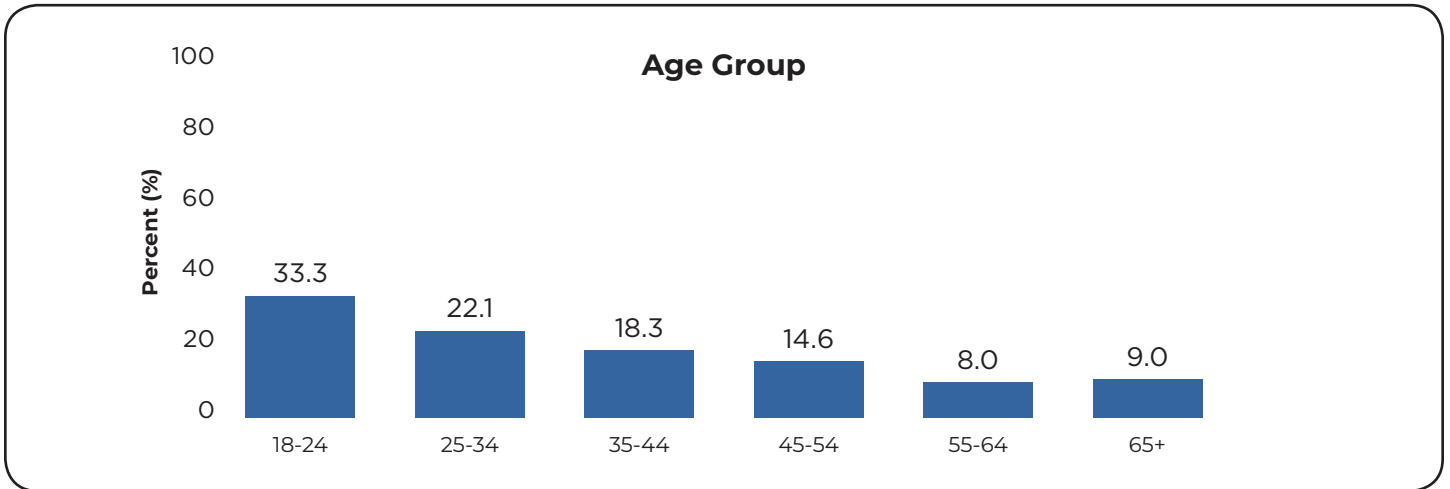


Figure 110. Suicide Ideation, by Education, in the CNMI, 2023

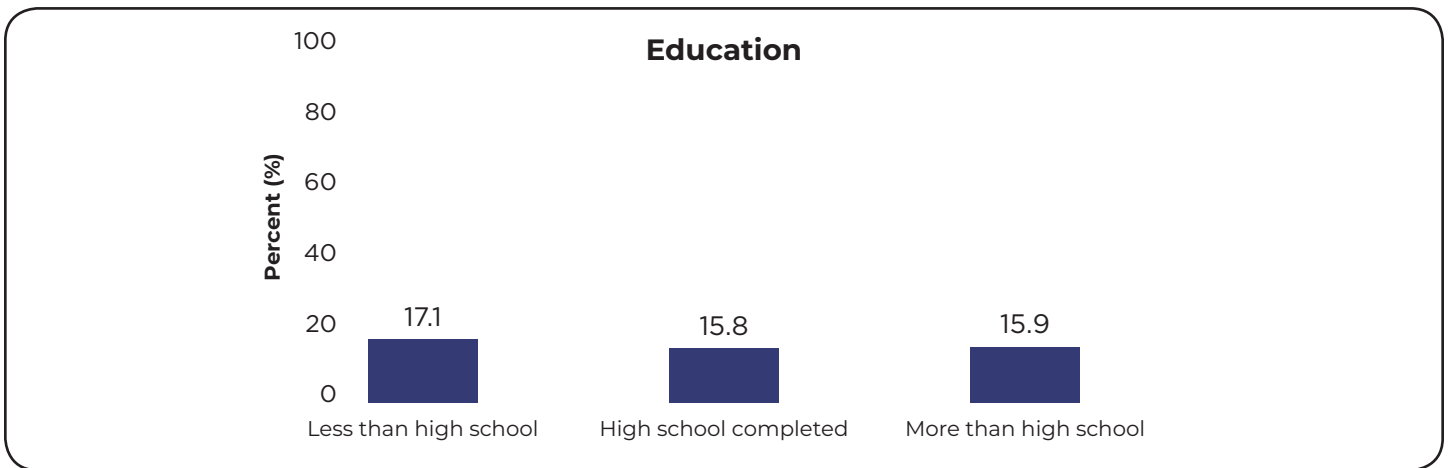
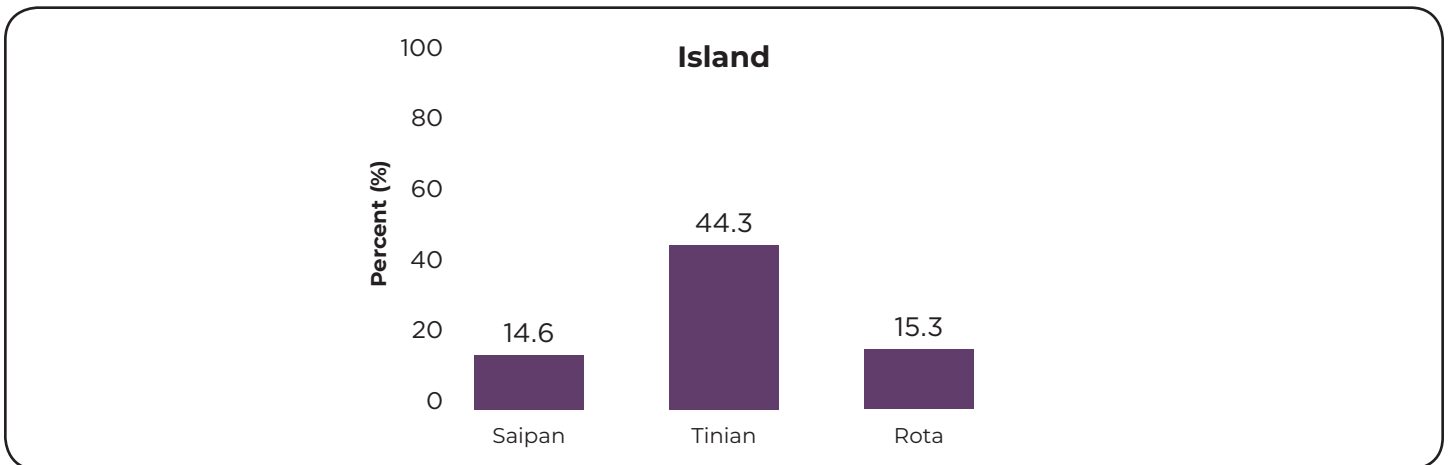


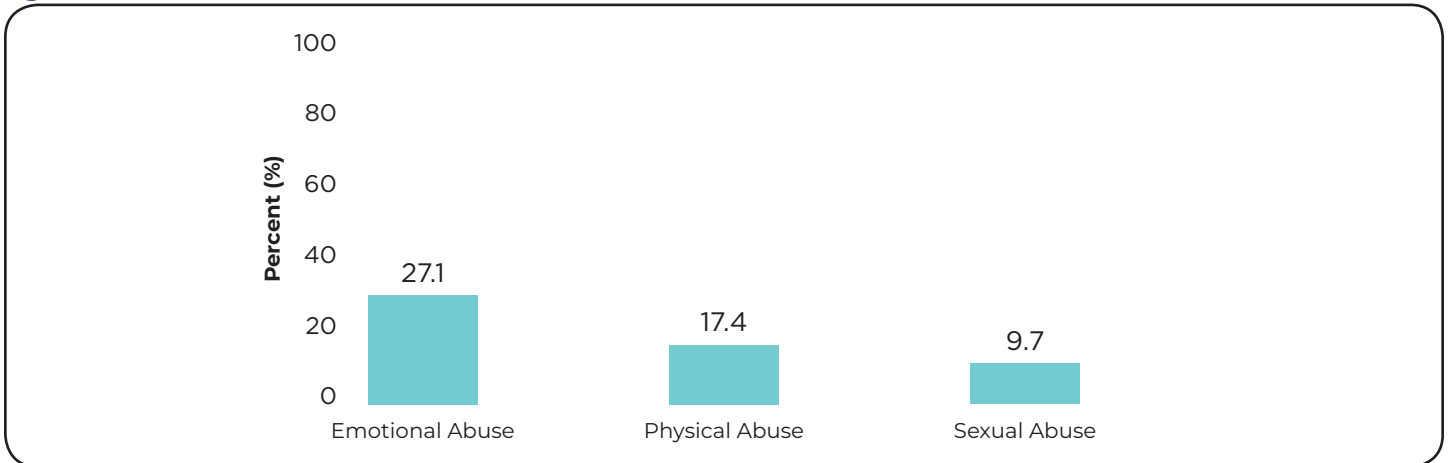
Figure 111. Suicide Ideation, by Island, in the CNMI, 2023



Mental Health: ACEs

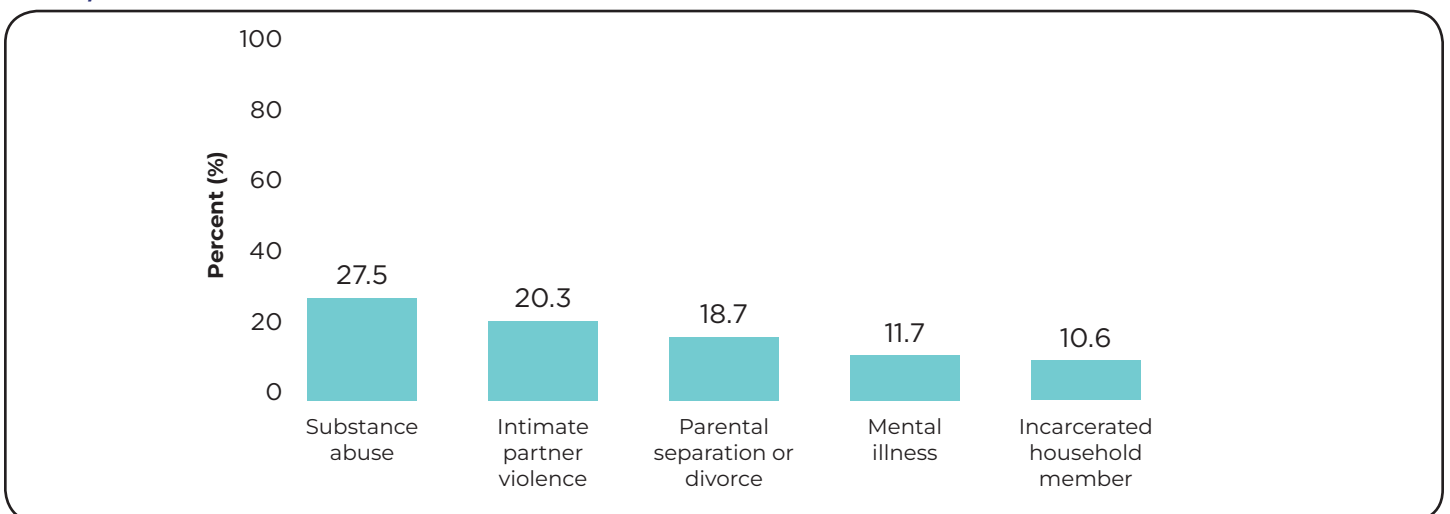
Adverse Childhood Experiences (ACEs) are traumatic events that occur before the age of 18 that can impact a child's brain and health as they grow into adults. There were 11 questions asked to all adults about emotional abuse, physical abuse, sexual abuse, and household problems. Among adults in the CNMI, 27.1% reported emotional abuse as a child, 17.4% reported physical abuse as a child, and 9.7% reported sexual abuse as a child.

Figure 112. Percent of adults who reported emotional, physical, and sexual abuse before age 18 in the CNMI, 2023



The most commonly reported household problem during childhood was substance abuse in the home (27.5%), followed by intimate partner violence (20.3%), parental separation or divorce (18.7%), mental illness in the home (11.7%), and having an incarcerated household member (10.6%).

Figure 113. Percent of adults who reported specific household problems before age 18 in the CNMI, 2023



Mental Health: ACEs

55.6% of adults in the CNMI reported at least one ACE. High risk is considered having 4 or more ACEs, and 14.0% (95%CI: 12.4%-15.7%) of adults in the CNMI reported 4 or more ACEs. Reports of 4+ ACEs was significantly higher among younger adults (18-34 years old), those residing in Tinian and Rota, and Chamorro, Carolinian, and other Pacific Islander populations.

Figure 114. Percentage of Adults with 4+ ACEs, by Ethnicity, in the CNMI, 2023

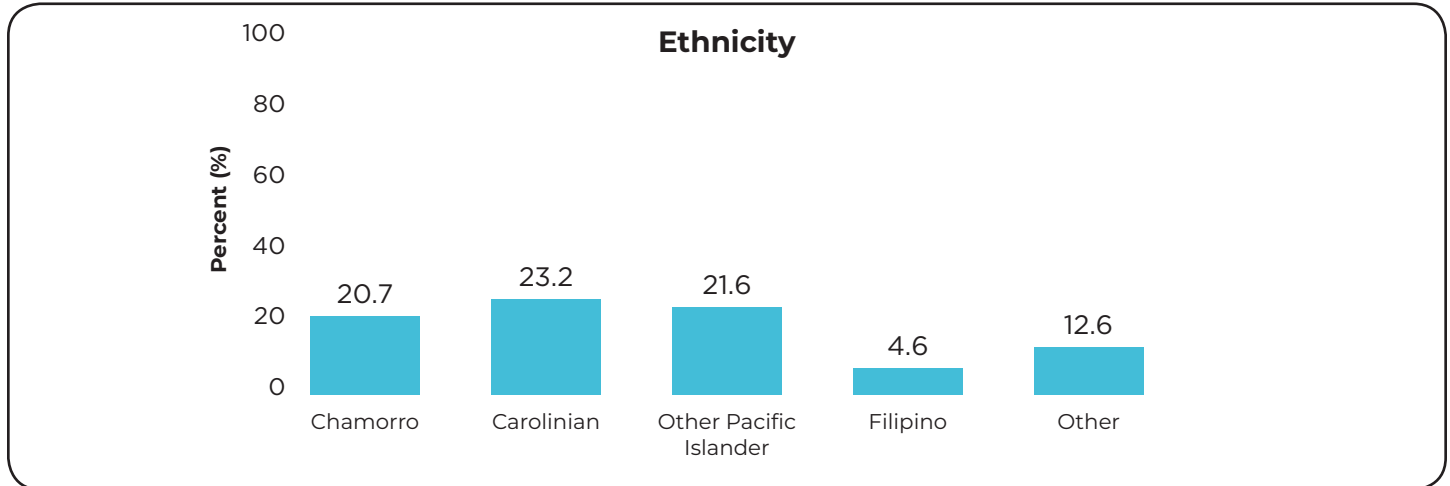
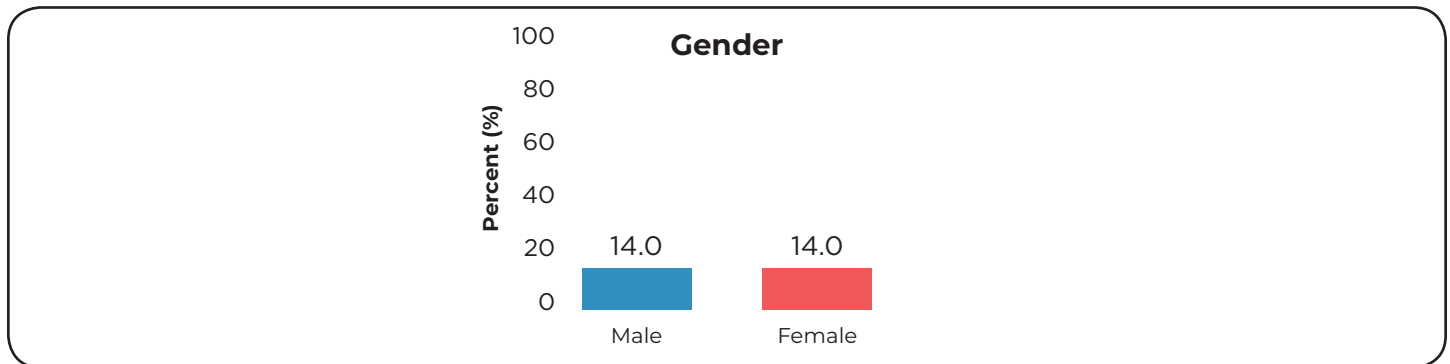


Figure 115. Percentage of Adults with 4+ ACEs, by Gender, in the CNMI, 2023



Mental Health: ACEs

Figure 116. Percentage of Adults with 4+ ACEs, by Age, in the CNMI, 2023

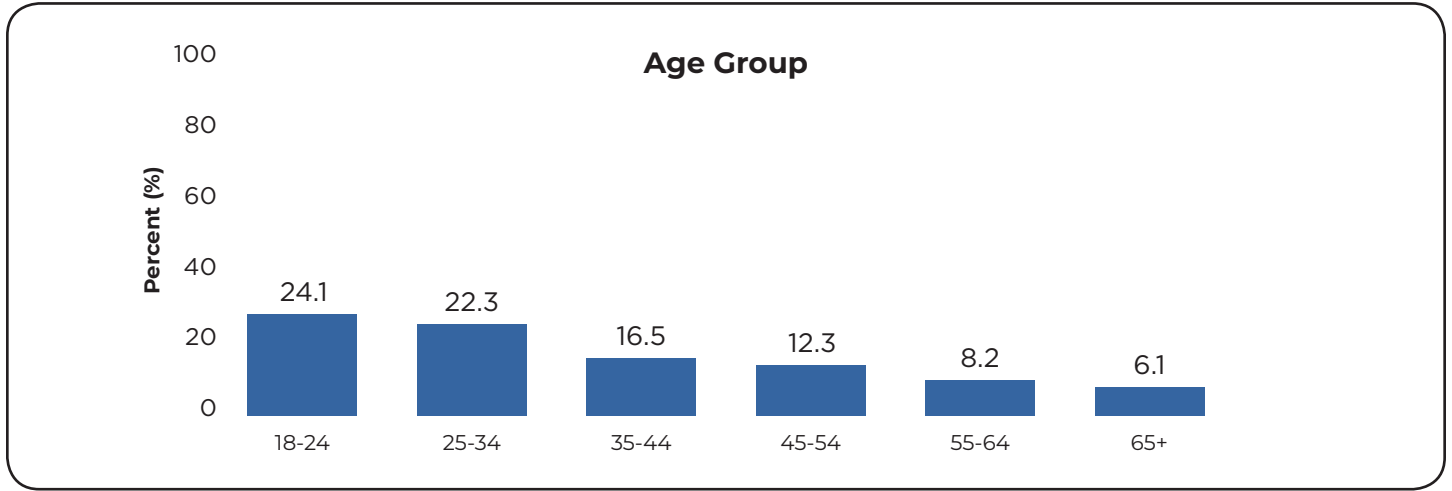


Figure 117. Percentage of Adults with 4+ ACEs, by Education, in the CNMI, 2023

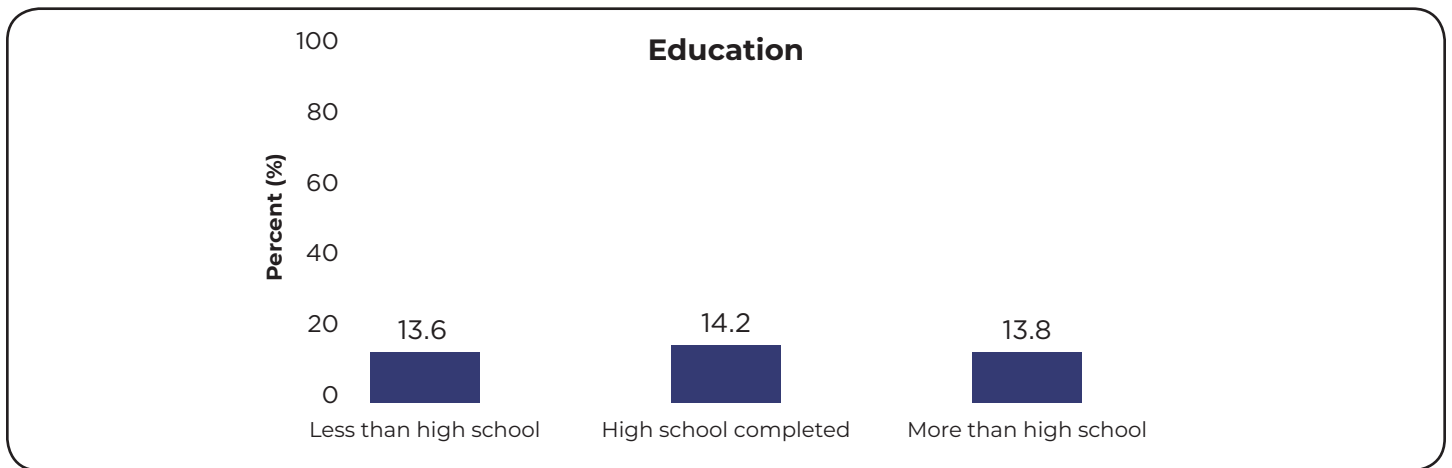
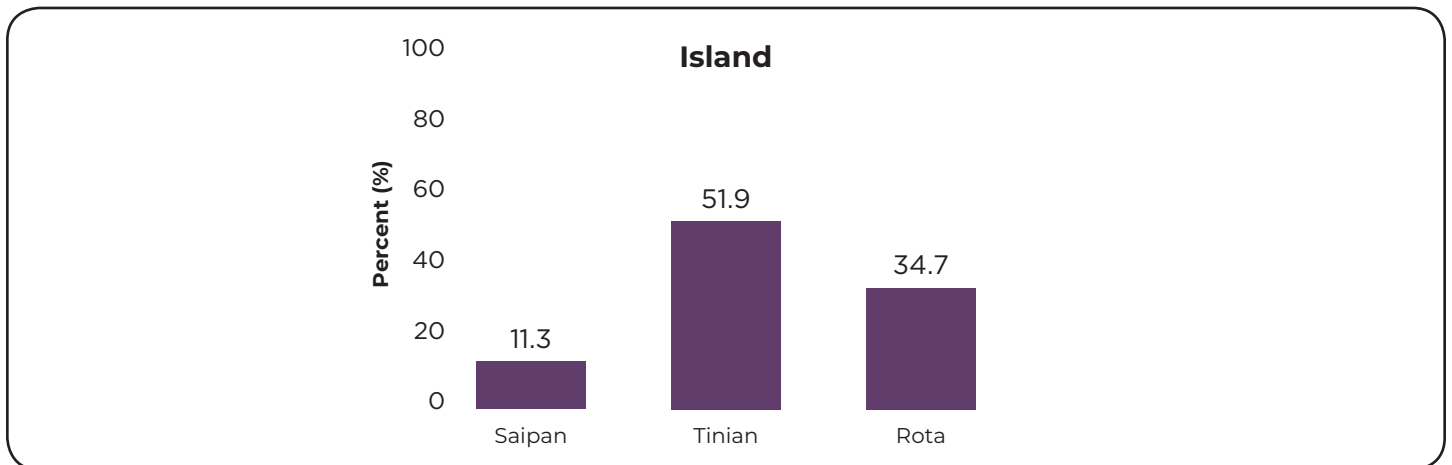


Figure 118. Percentage of Adults with 4+ ACEs, by Island, in the CNMI, 2023



Fruit and Vegetable Consumption

Almost 9 out of 10 adults in the CNMI (87.9%; 95%CI: 86.3%-89.4%) consumed less than the recommended daily servings of fruits and vegetables (at least 5 per day). Low fruit and vegetable consumption (<5 servings per day) was highest among those <45 years old, men, and Chamorro, Carolinian, other Pacific Islander, and Filipino populations.

Figure 119. Percentage of Adults with <5 servings FV, by Ethnicity, in the CNMI, 2023

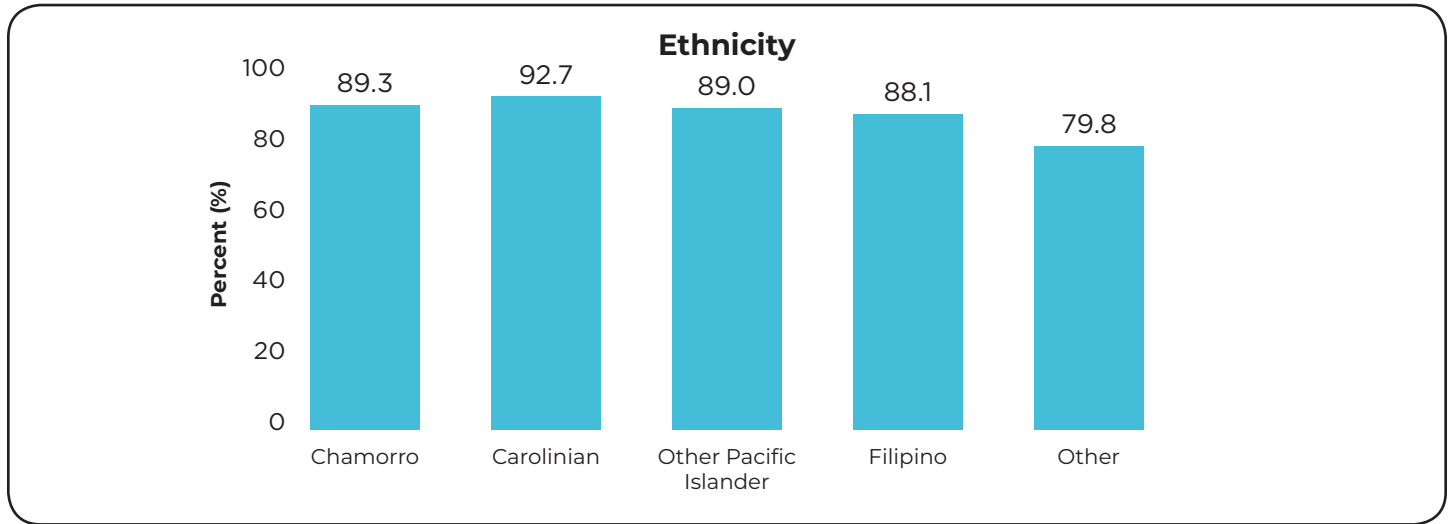
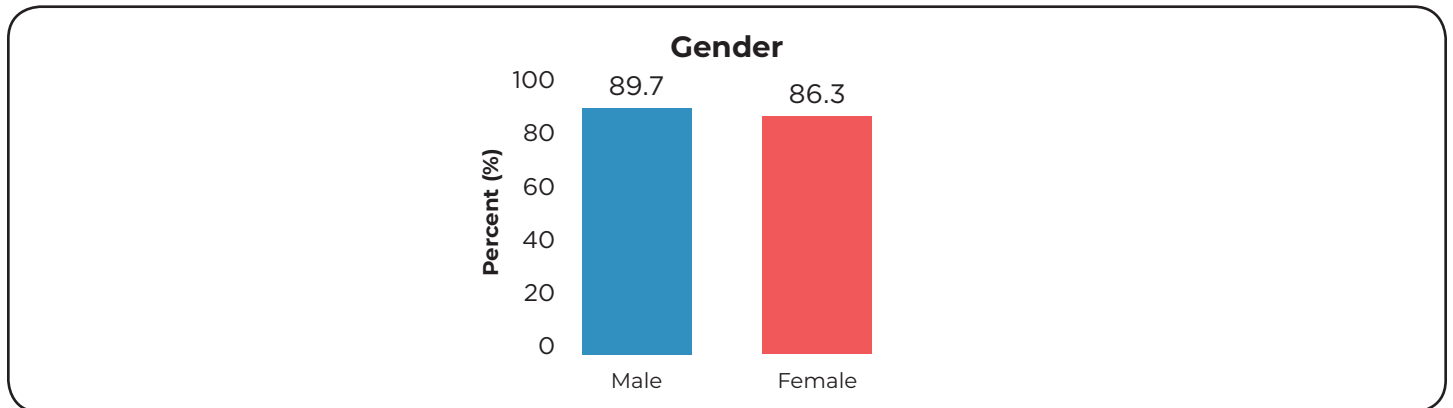


Figure 120. Percentage of Adults with <5 servings FV, by Gender, in the CNMI, 2023



Fruit and Vegetable Consumption

Figure 121. Percentage of Adults with <5 servings FV, by Age, in the CNMI, 2023

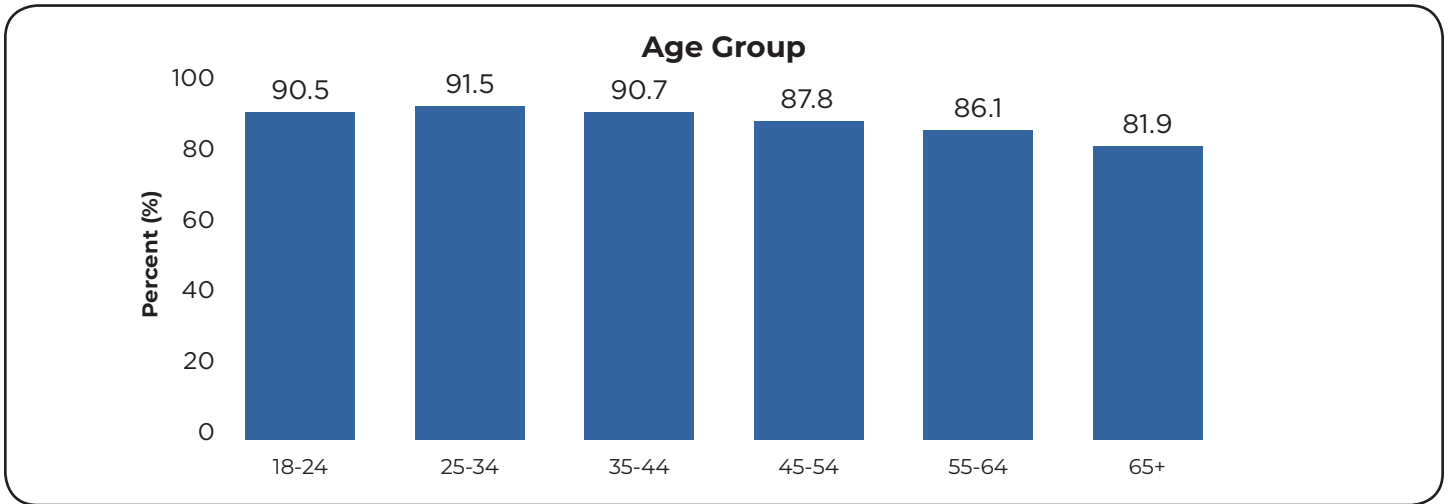


Figure 122. Percentage of Adults with <5 servings FV, by Education, in the CNMI, 2023

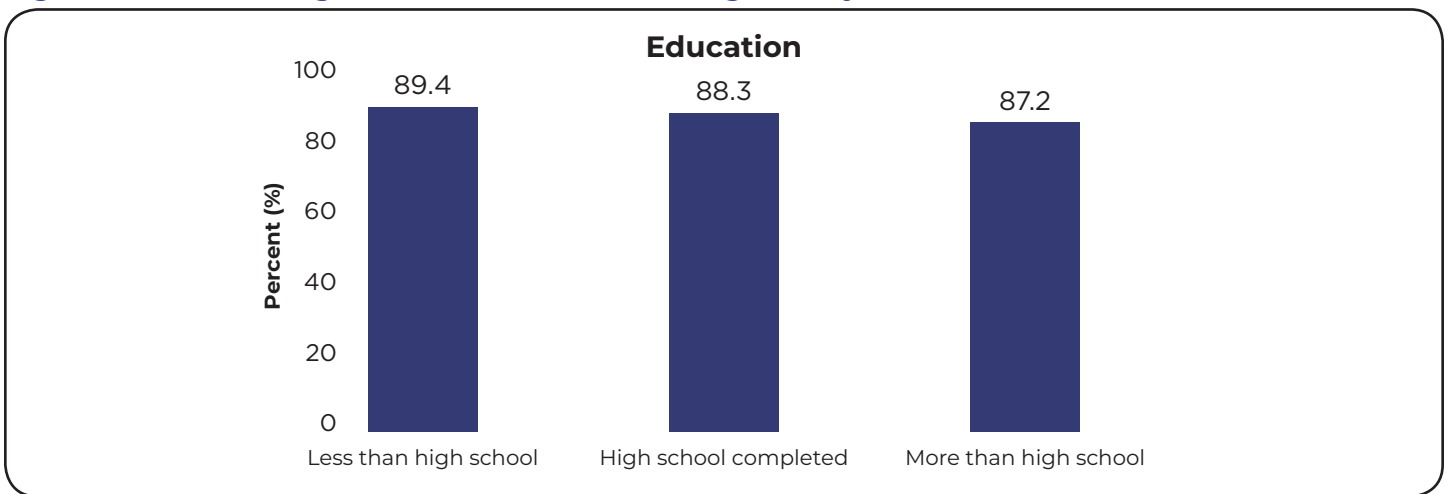
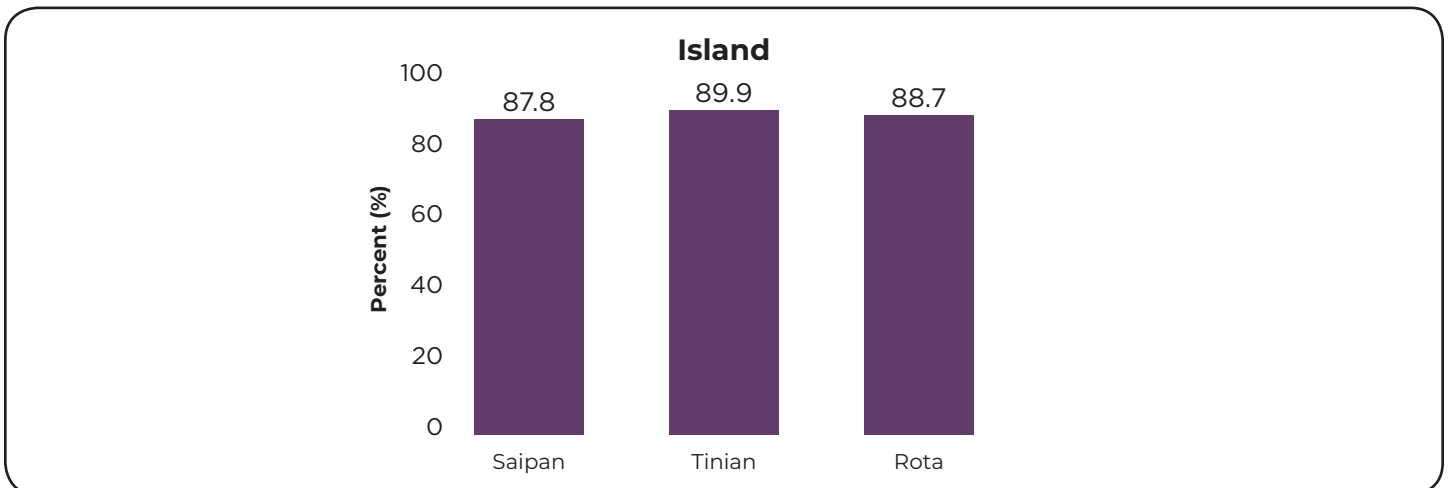


Figure 123. Percentage of Adults with <5 servings FV, by Island, in the CNMI, 2023



Processed Meat Consumption

About 2 out of 3 adults in the CNMI (68.9%) consumed processed meats at least once per day. Almost one-third (29.0%) consume processed meats two or more times per day. Heavy consumption of processed meats (2+ times per day) was more prevalent among those residing in Tinian and Rota, younger adults (especially those 18-24 years old), those with a high school only education, and Chamorro, Carolinian, and other Pacific Islander populations.

Figure 124. Percentage of Adults eating processed meats 2+ times/day, by Ethnicity, in the CNMI, 2023

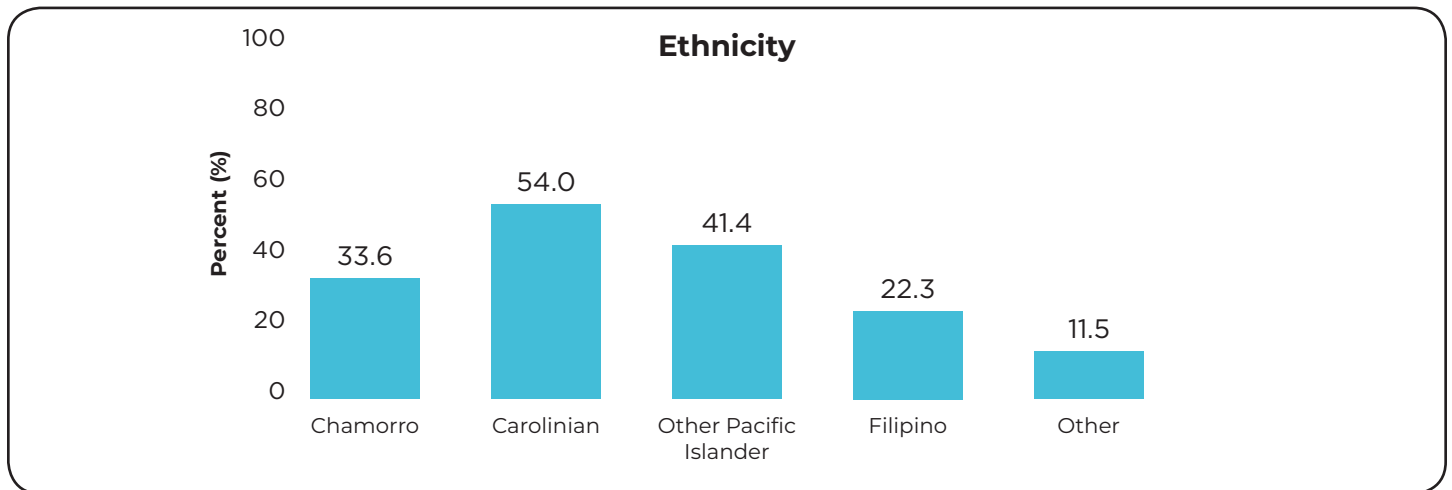
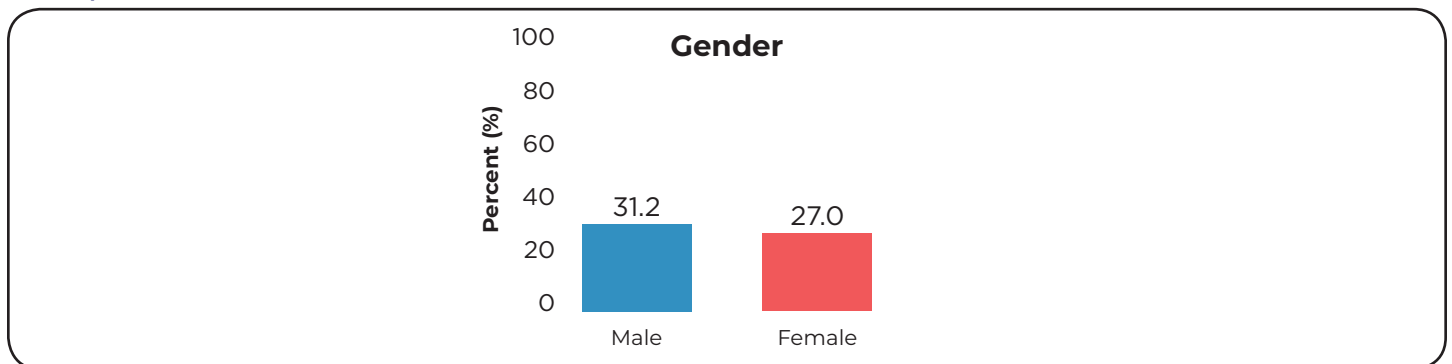


Figure 125. Percentage of Adults eating processed meats 2+ times/day, by Gender, in the CNMI, 2023



Processed Meat Consumption

Figure 126. Percentage of Adults eating processed meats 2+ times/day, by Age, in the CNMI, 2023

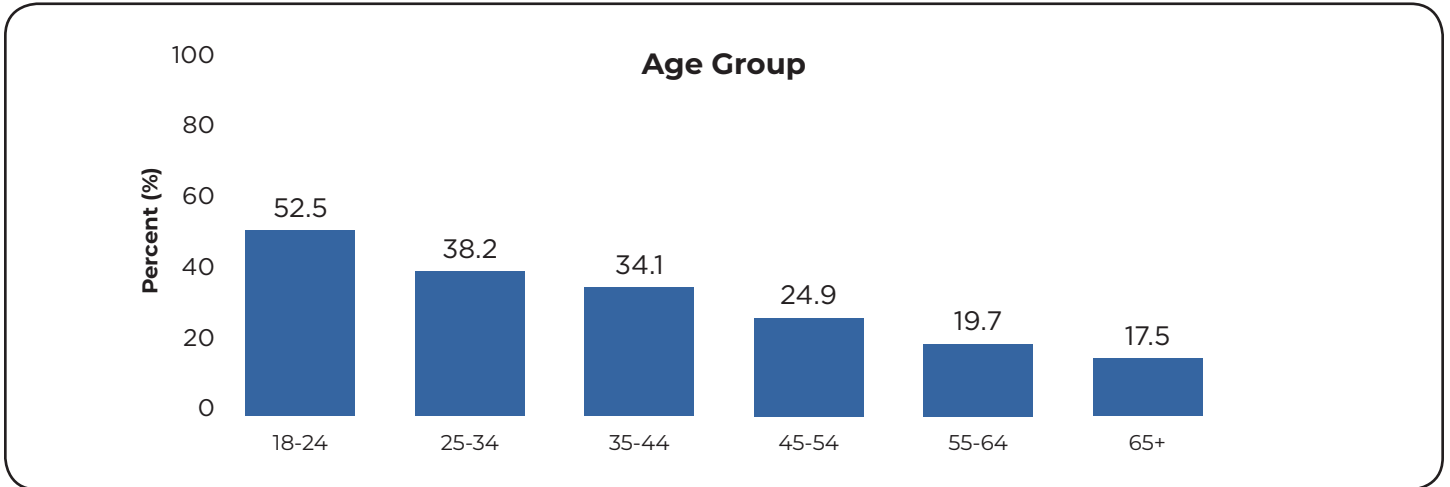


Figure 127. Percentage of Adults eating processed meats 2+ times/day, by Education, in the CNMI, 2023

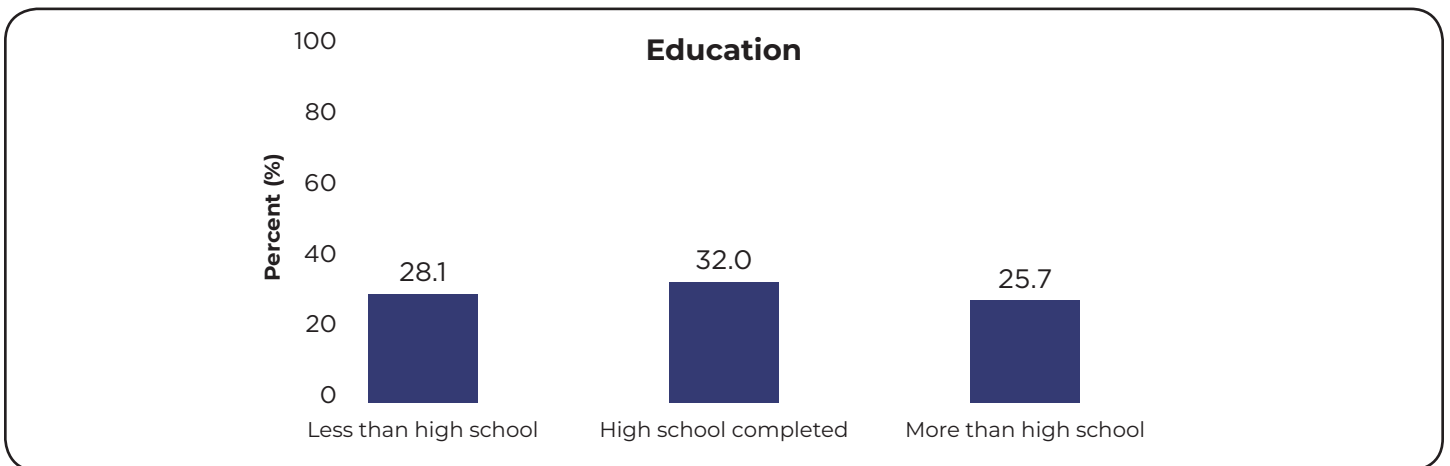
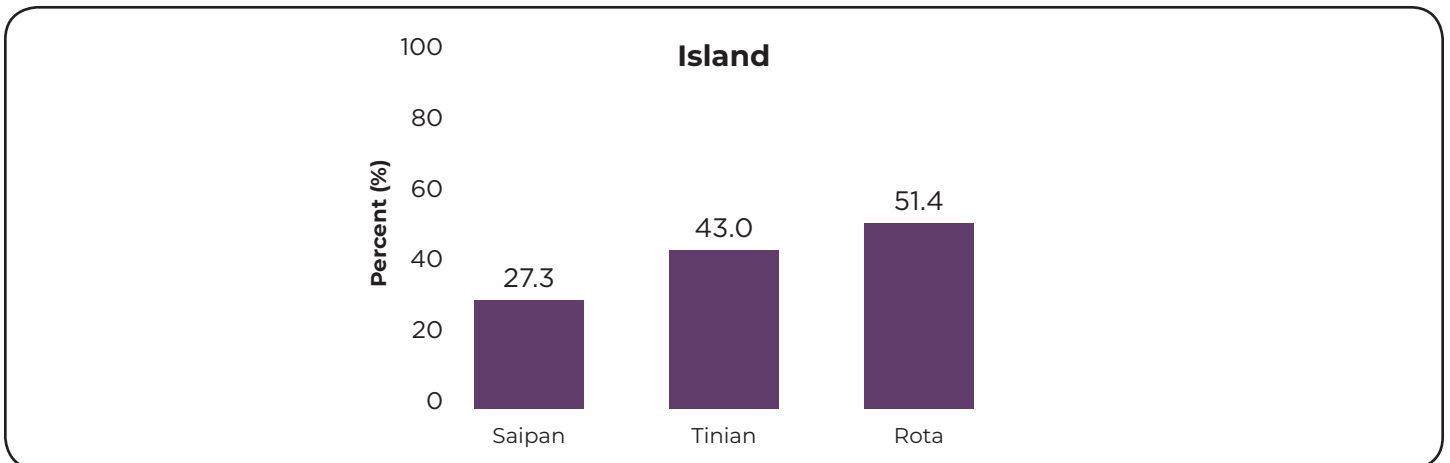


Figure 128. Percentage of Adults eating processed meats 2+ times/day, by Island, in the CNMI, 2023



Sugar Sweetened Beverages

Two out of three adults (66.4%) in the CNMI consume at least one sugar-sweetened beverage (SSB) each day. About one in five adults (19.7%) consume 3 or more SSBs each day. Heavy consumption of SSBs (3+ per day) was significantly higher among those residing in Tinian and Rota, younger adults (especially those 18-24 years old), and Chamorro, Carolinian, and other Pacific Islander populations.

Figure 129. Percentage of Adults drinking 3+ SSBs per day, by Ethnicity, in the CNMI, 2023

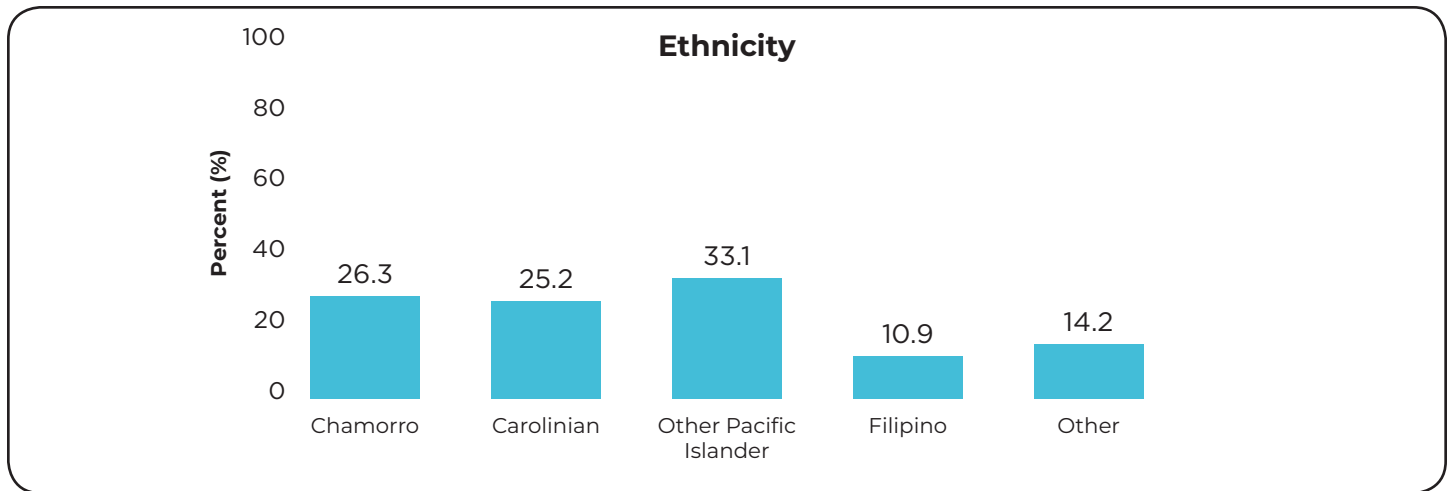
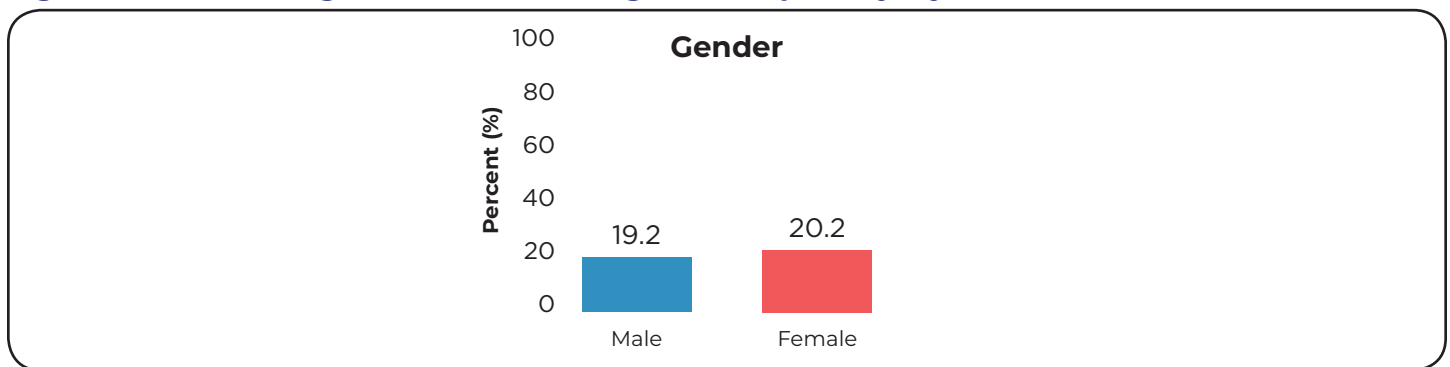


Figure 130. Percentage of Adults drinking 3+ SSBs per day, by Gender, in the CNMI, 2023



Sugar Sweetened Beverages

Figure 131. Percentage of Adults drinking 3+ SSBs per day, by Age, in the CNMI, 2023

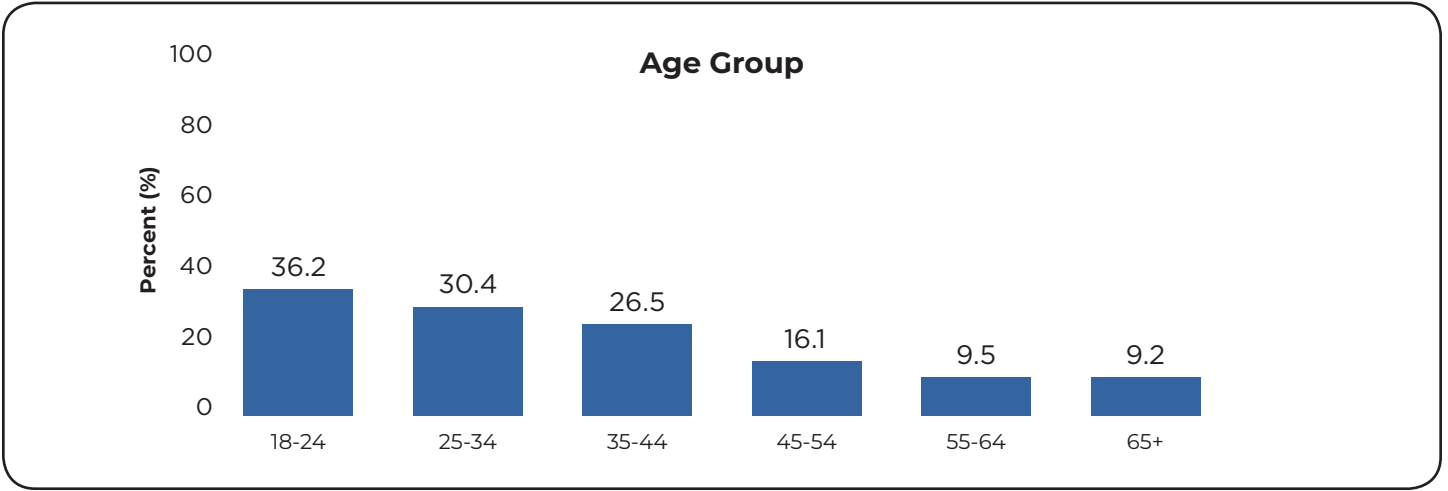


Figure 132. Percentage of Adults drinking 3+ SSBs per day, by Education, in the CNMI, 2023

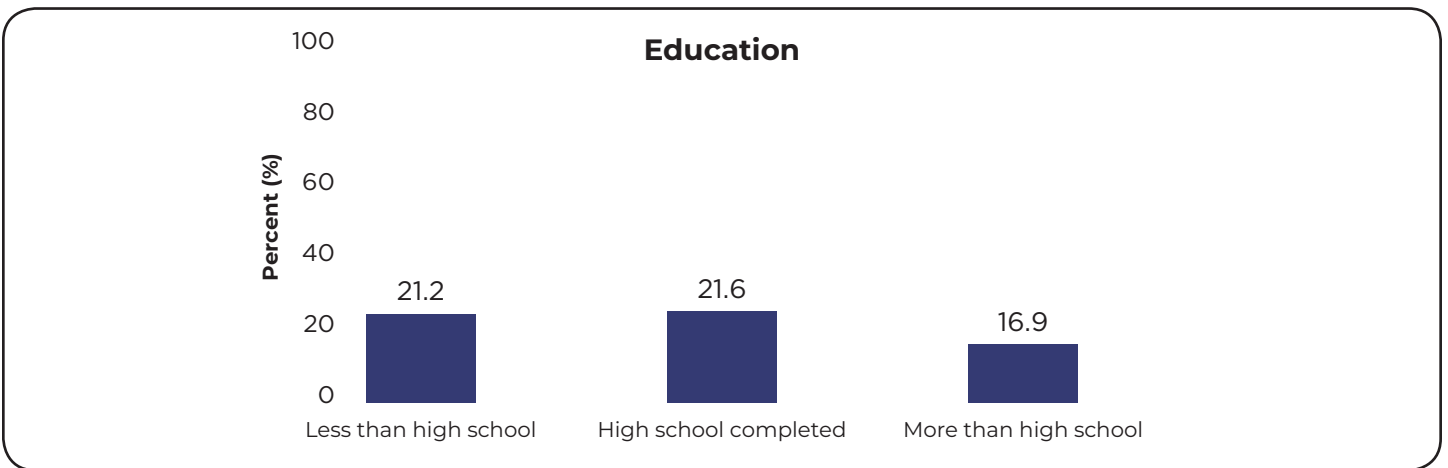
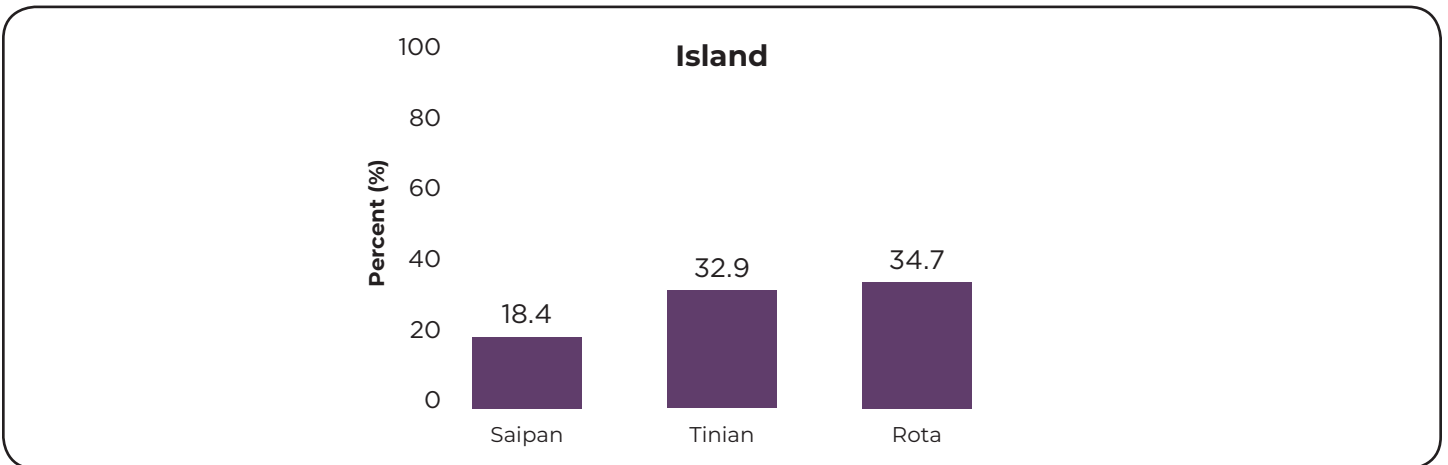


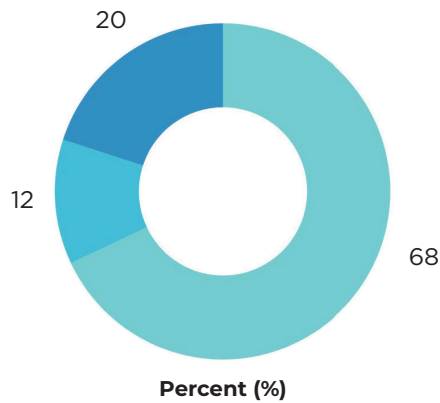
Figure 133. Percentage of Adults drinking 3+ SSBs per day, by Island, in the CNMI, 2023



Local vs. Imported Produce

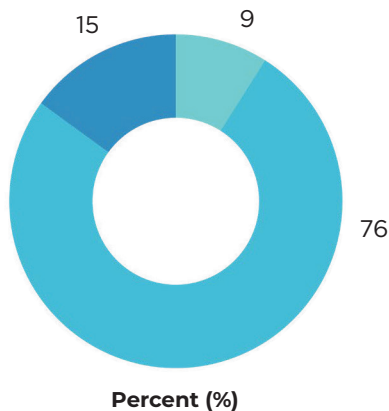
The majority of adults in the CNMI (68%) feel the quality of local produce is higher than imported produce, and the majority of adults in the CNMI (76%) feel that the price of imported produce is higher than local produce.

Figure 134. How does the quality of local produce compare to the quality of imported produce?



- The quality of local produce is higher than imported produce
- The quality of imported produce is higher than local produce
- The quality of local produce and imported produce is about the same

Figure 135. How does the price of local produce compare to the price of imported produce?



- The price of local produce is higher than imported produce
- The price of imported produce is higher than local produce
- The price of local produce and imported produce is about the same

Regular Diet

Figure 136. Perceived overall diet among adults in the CNMI, 2023

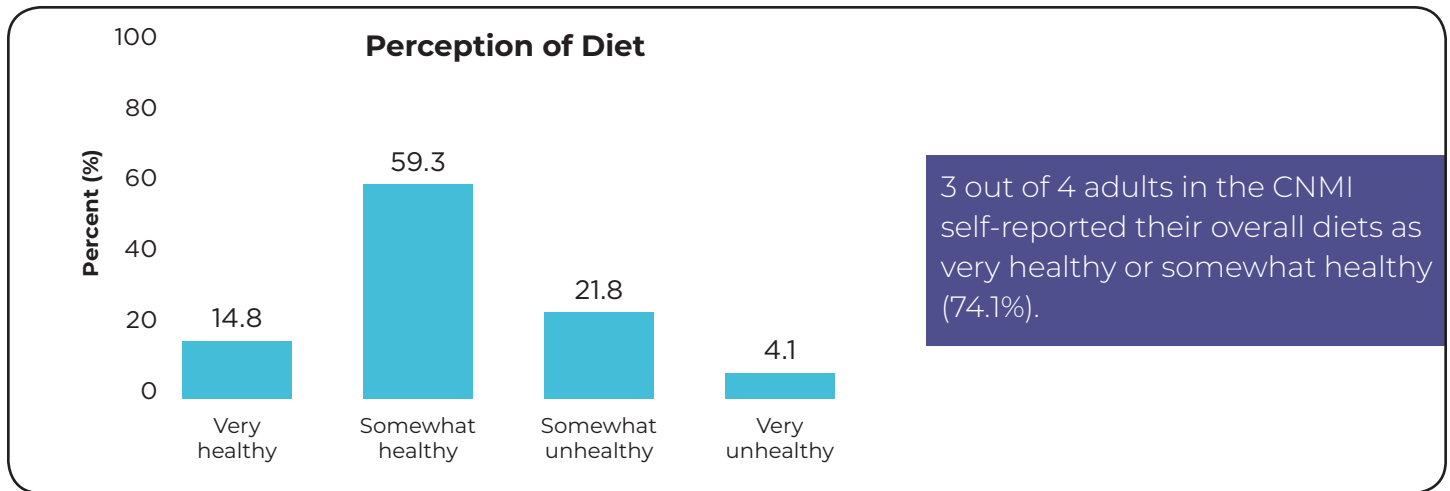


Figure 137. Perception on food security among adults in the CNMI, 2023

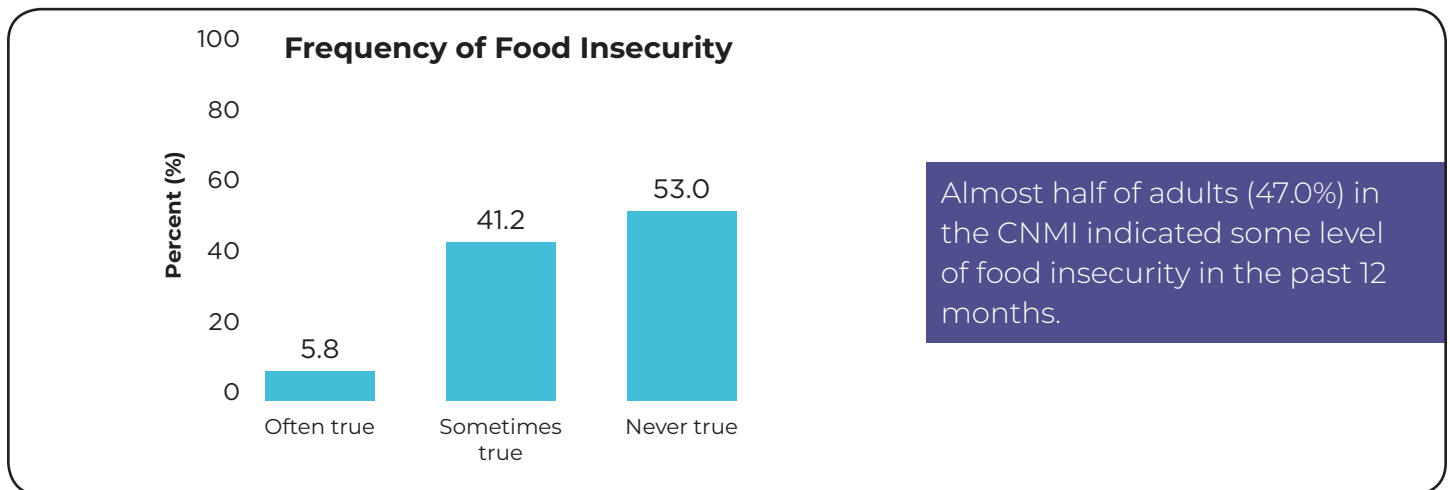
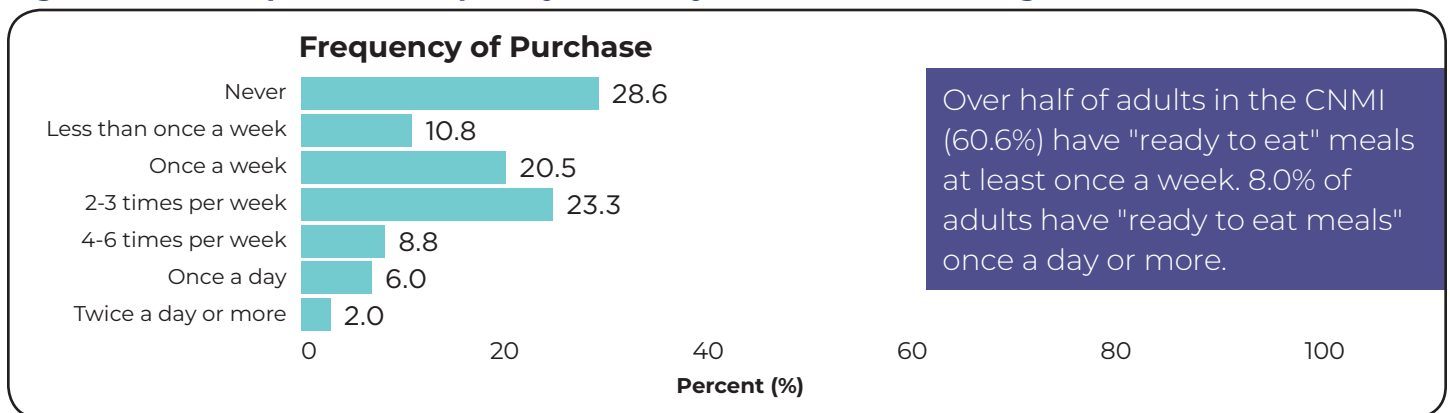


Figure 138. Perception on frequency of "ready to eat" meals among adults in the CNMI, 2023



Physical Activity

Among adults in the CNMI, about half (53.7%; 95%CI: 51.3%-56.0%) reported getting the recommended amount of aerobic physical activity (150 minutes a week of moderate-intensity aerobic activity or 75 minutes a week of vigorous-intensity aerobic activity [or a combination of both]). Physical activity was higher among those residing in Rota and Tinian, younger adults (18-24 years old), men, and Chamorro and Carolinian populations.

Figure 139. Percentage of Adults getting Physical Activity, by Ethnicity, in the CNMI, 2023

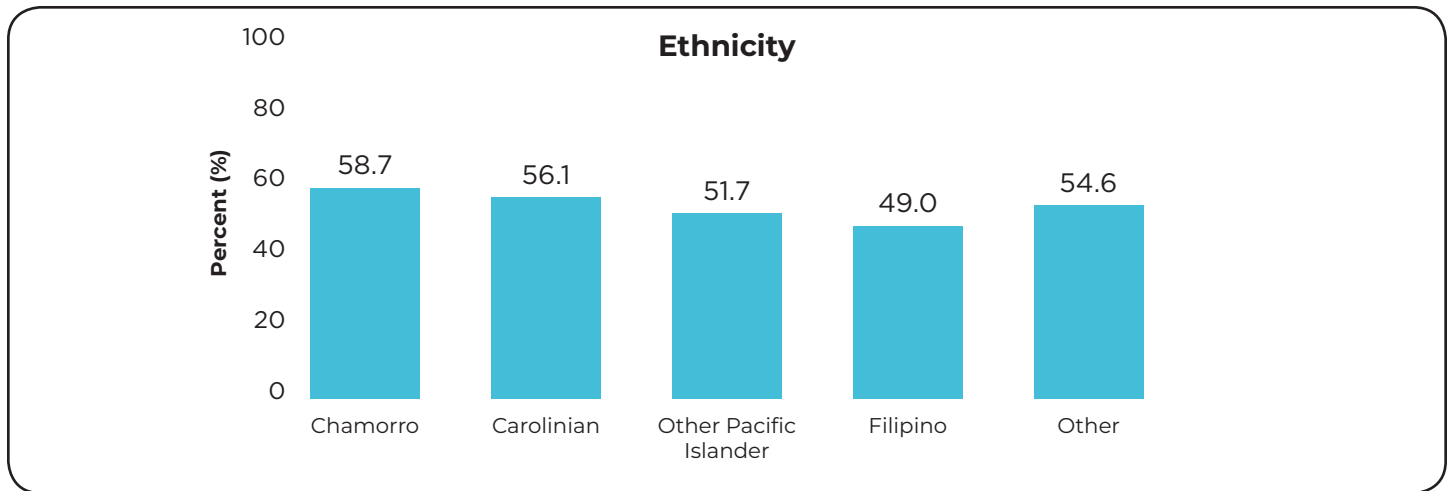
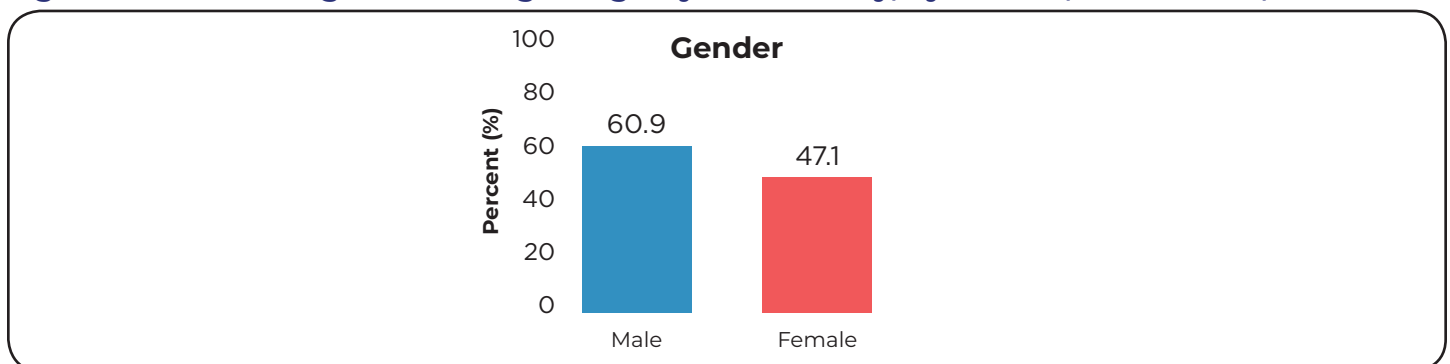


Figure 140. Percentage of Adults getting Physical Activity, by Gender, in the CNMI, 2023



Physical Activity

Figure 141. Percentage of Adults getting Physical Activity, by Age, in the CNMI, 2023

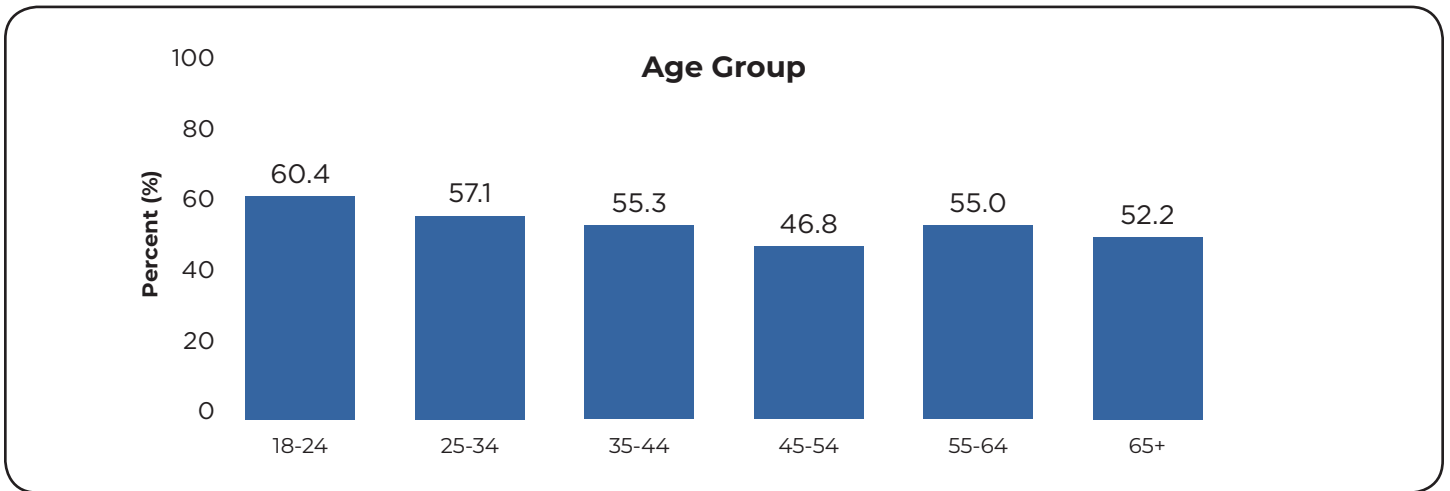


Figure 142. Percentage of Adults getting Physical Activity, by Education, in the CNMI, 2023

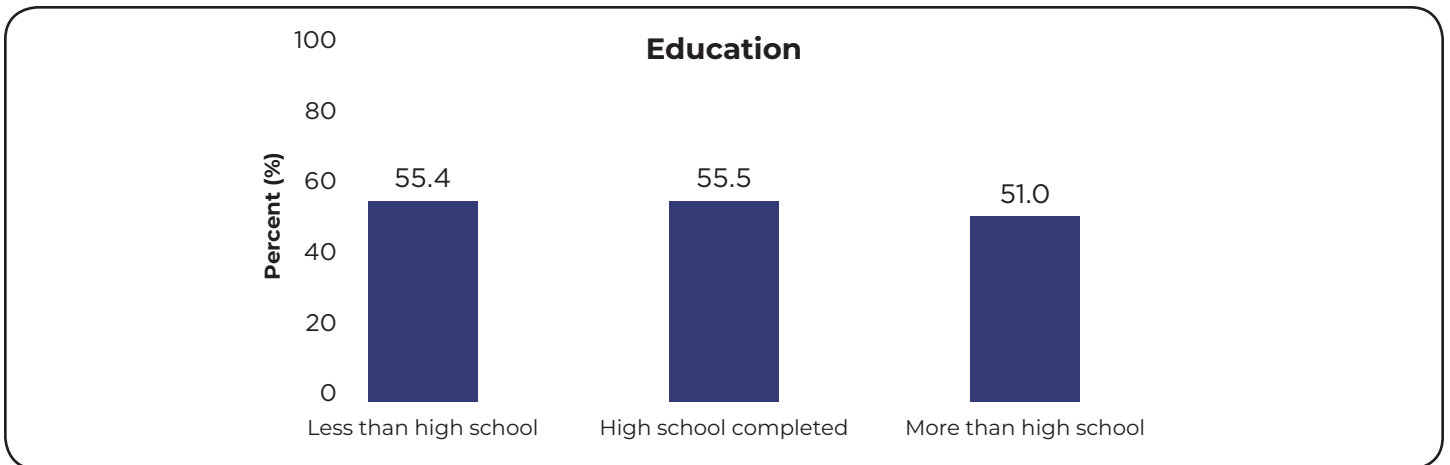
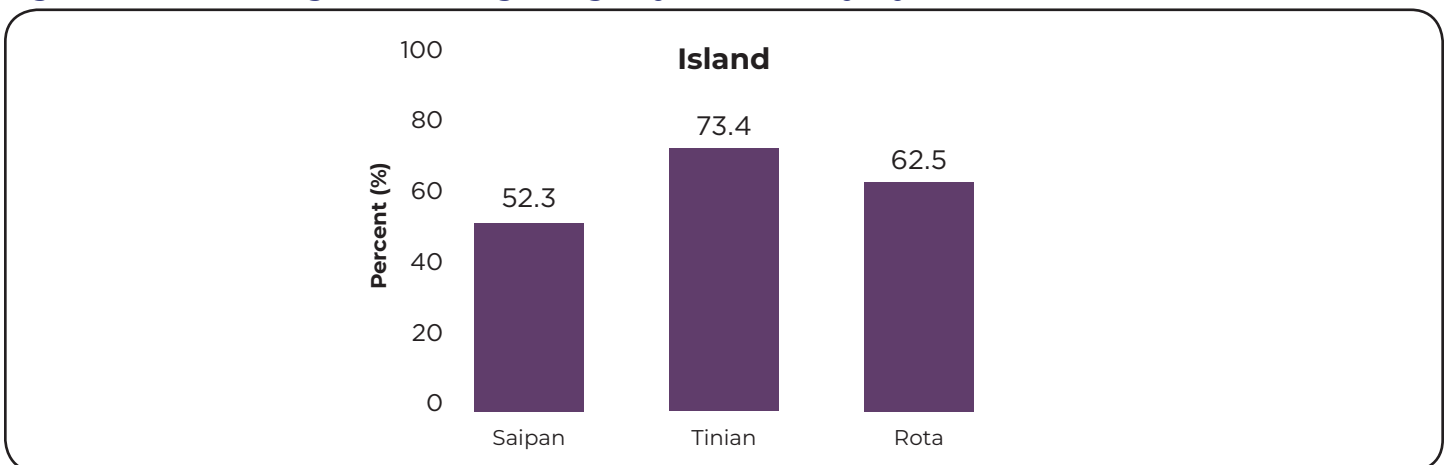


Figure 143. Percentage of Adults getting Physical Activity, by Island, in the CNMI, 2023



Colon Cancer Screening: Colonoscopy

Three out of four adults 50-75 years old in the CNMI (76.0%; 95% CI: 75.9%-81.9%) have never received a colonoscopy and 20.8% of adults 50-75 years met the American Cancer Society recommendation for receiving a colonoscopy every 10 years. Having a colonoscopy in the past 10 years (among 50-74-year-olds) was significantly higher among those 65 and older, and significantly lower among Other Pacific Islander populations.

Figure 144. Percentage of Adults who got a Colonoscopy in past 10 years (50-74yo), by Ethnicity, in the CNMI, 2023

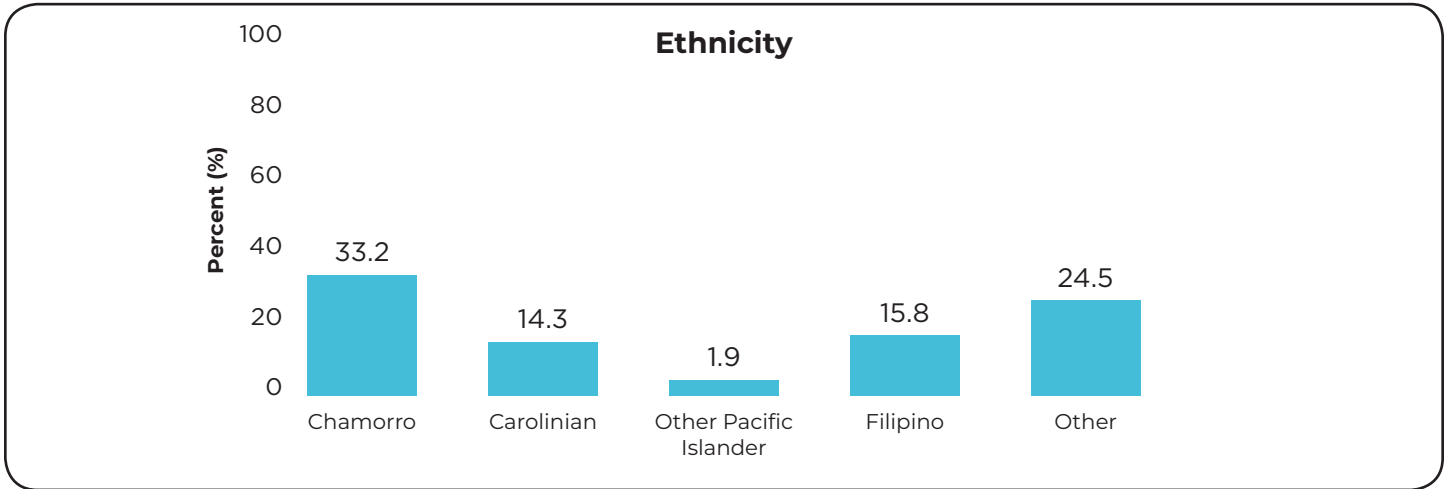
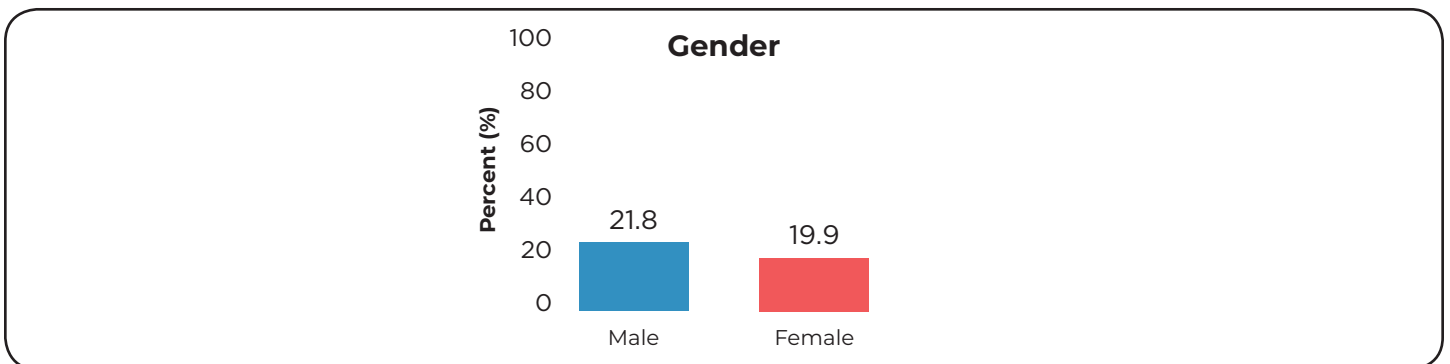


Figure 145. Percentage of Adults who got a Colonoscopy in past 10 years (50-74yo), by Gender, in the CNMI, 2023



Colon Cancer Screening: Colonoscopy

Figure 146. Percentage of Adults who got a Colonoscopy in past 10 years (50-74yo), by Age, in the CNMI, 2023

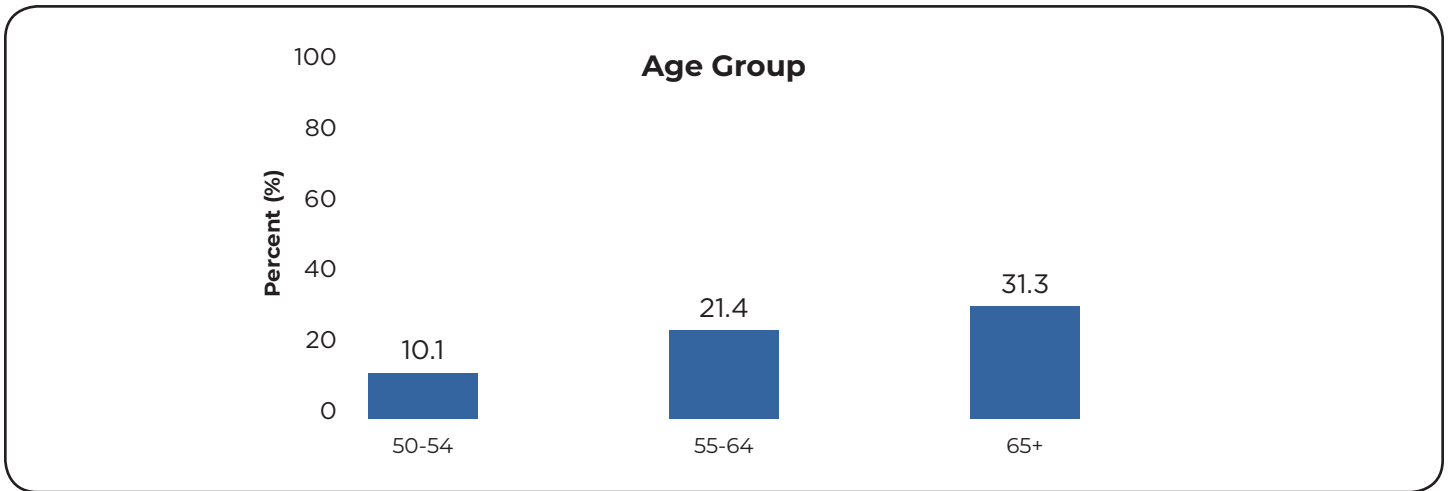


Figure 147. Percentage of Adults who got a Colonoscopy in past 10 years (50-74yo), by Education, in the CNMI, 2023

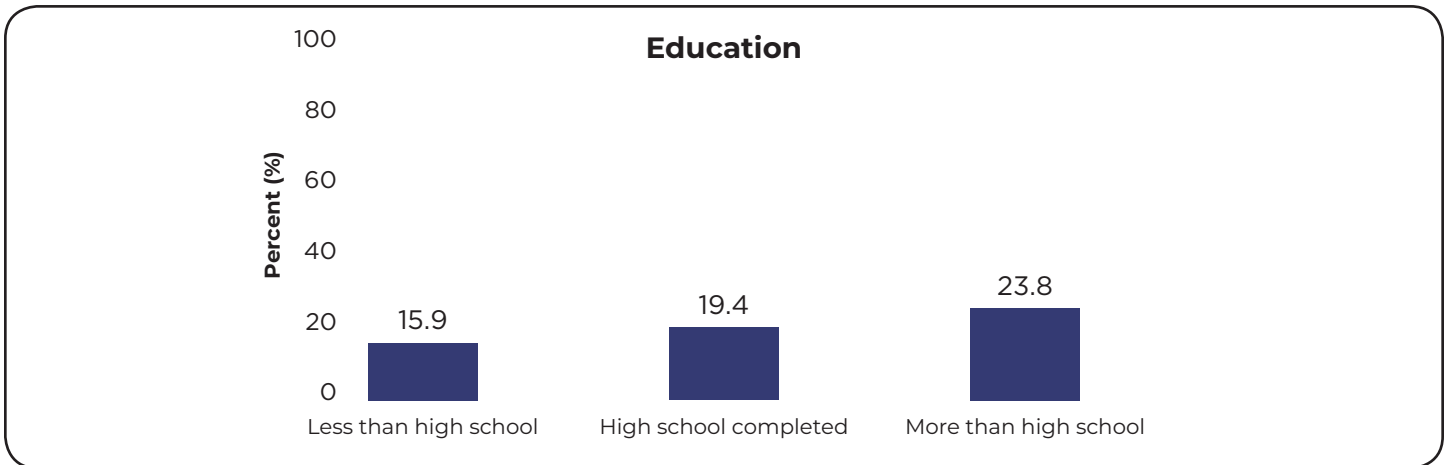
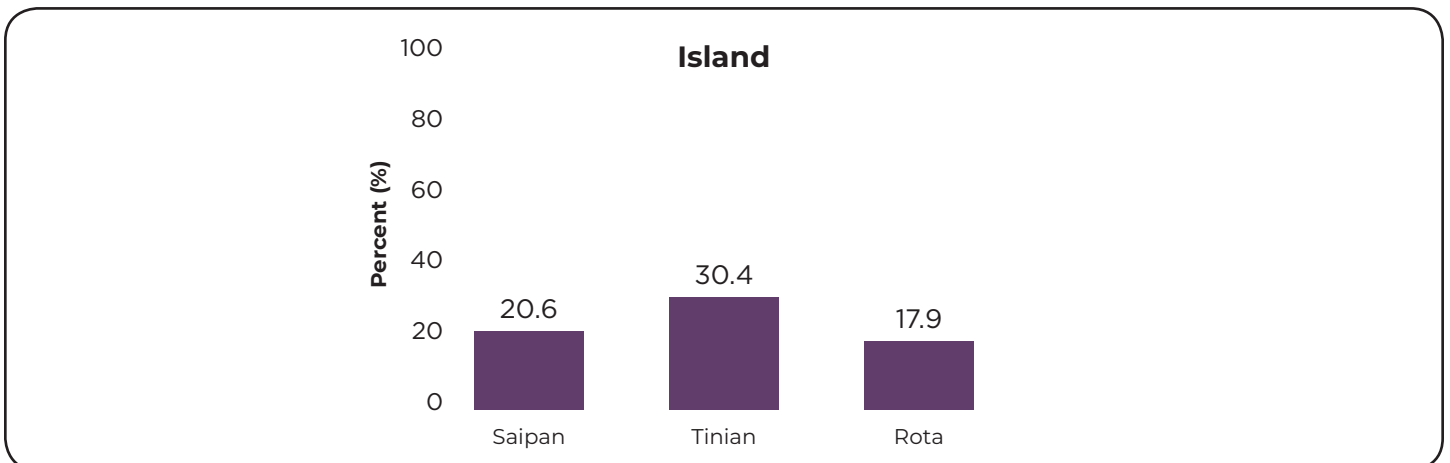


Figure 148. Percentage of Adults who got a Colonoscopy in past 10 years (50-74yo), by Island, in the CNMI, 2023



Colon Cancer Screening: Blood Stool Test

About 3 out of 5 adults 50-75 years old in the CNMI (62.0%; 95%CI: 58.6%-65.5%) have never received a Blood Stool Test (BST) and 22.7% of adults 50-75 years old met the American Cancer Society recommendation of receiving a Blood Stool Test once in the past year. Having a BST in the past year (among 50–74-year-olds) was significantly higher among those residing in Saipan, those aged 55-64 years old, women, those with more than a high school education, and significantly lower among Carolinian and Other Pacific Islander populations.

Figure 149. Percentage of Adults who received a BST in past 10 years (50-74yo), by Ethnicity, in the CNMI, 2023

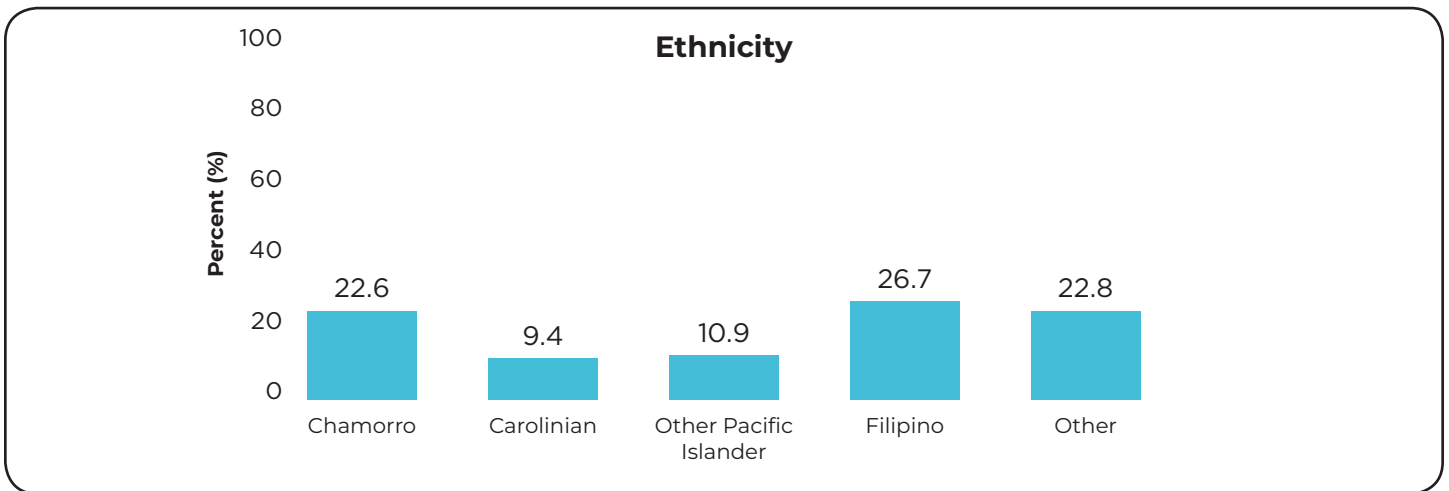
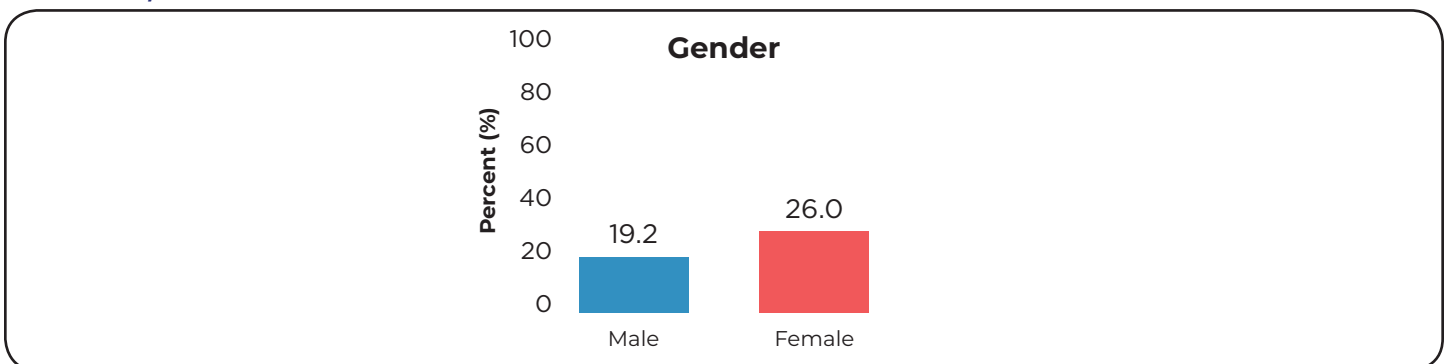


Figure 150. Percentage of Adults who received a BST in past 10 years (50-74yo), by Gender, in the CNMI, 2023



Colon Cancer Screening: Blood Stool Test

Figure 151. Percentage of Adults who received a BST in past 10 years (50-74yo), by Age, in the CNMI, 2023

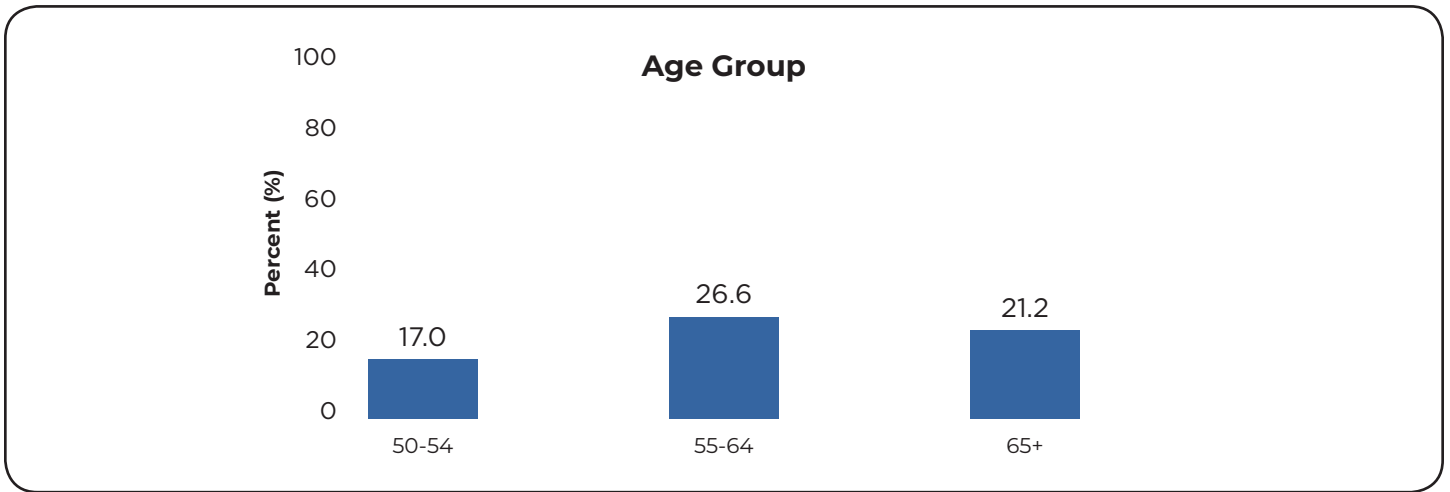


Figure 152. Percentage of Adults who received a BST in past 10 years (50-74yo), by Education, in the CNMI, 2023

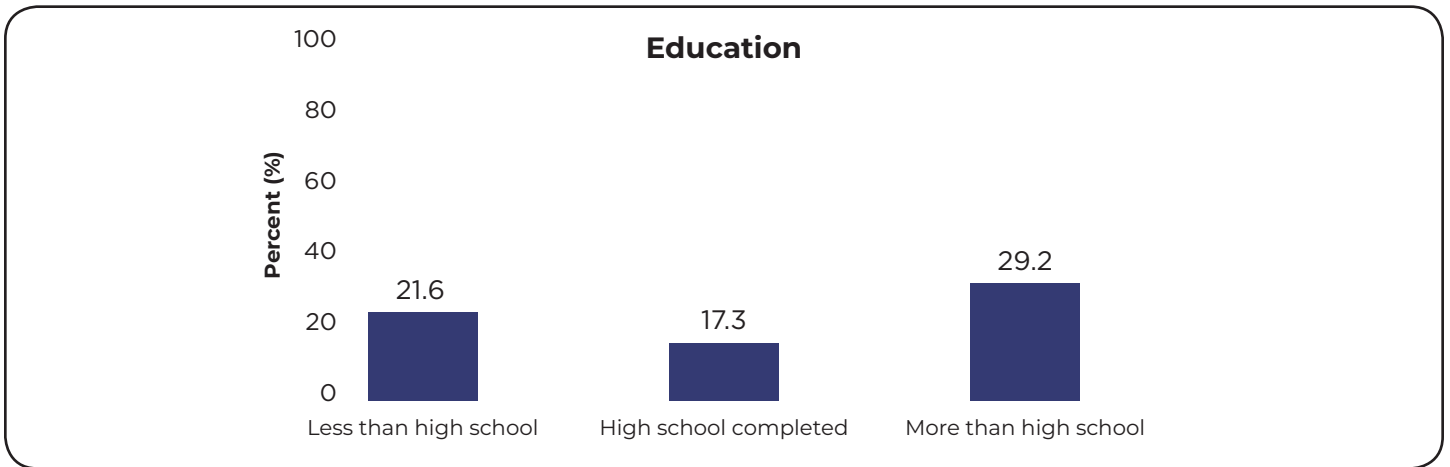
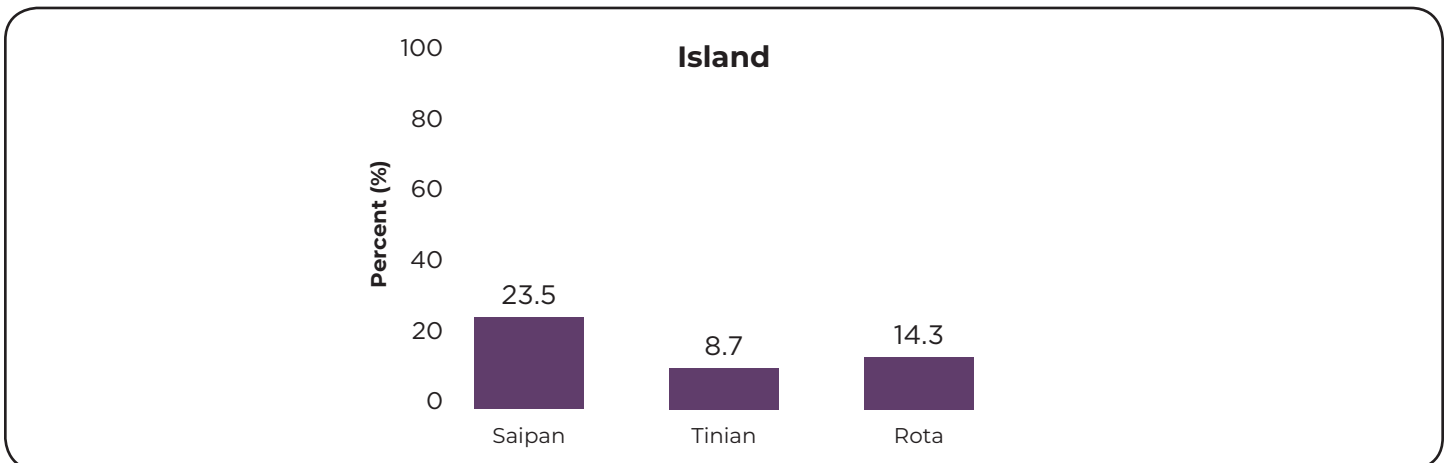


Figure 153. Percentage of Adults who received a BST in past 10 years (50-74yo), by Island, in the CNMI, 2023



Any Colon Cancer Screening

Among adults 50-75 years old, 35.2% (95%CI: 31.8%-38.7%) have had any colon cancer screening. Any colon cancer screening is defined as someone who has had a blood stool test in the past year and/or a colonoscopy in the past 10 years. Colon cancer screening was significantly higher among those 55 and older, those with more than a high school education, and significantly lower among Carolinian and Other Pacific Islander populations.

Figure 154. Percentage of Adults with Up-to date colon cancer screening (50-74yo), by Ethnicity, in the CNMI, 2023

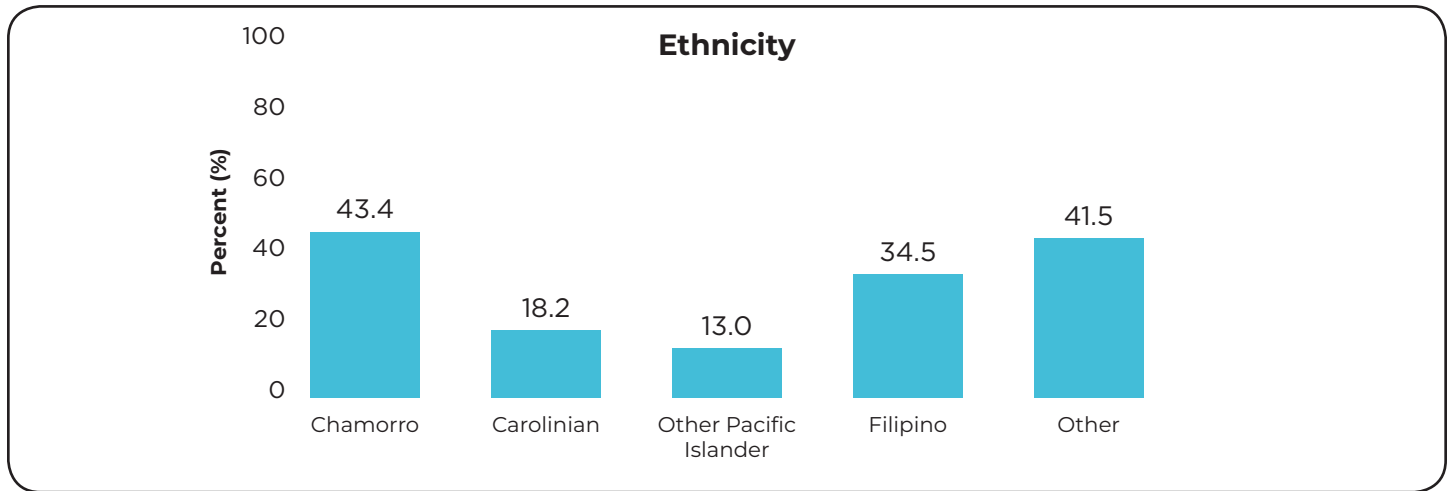
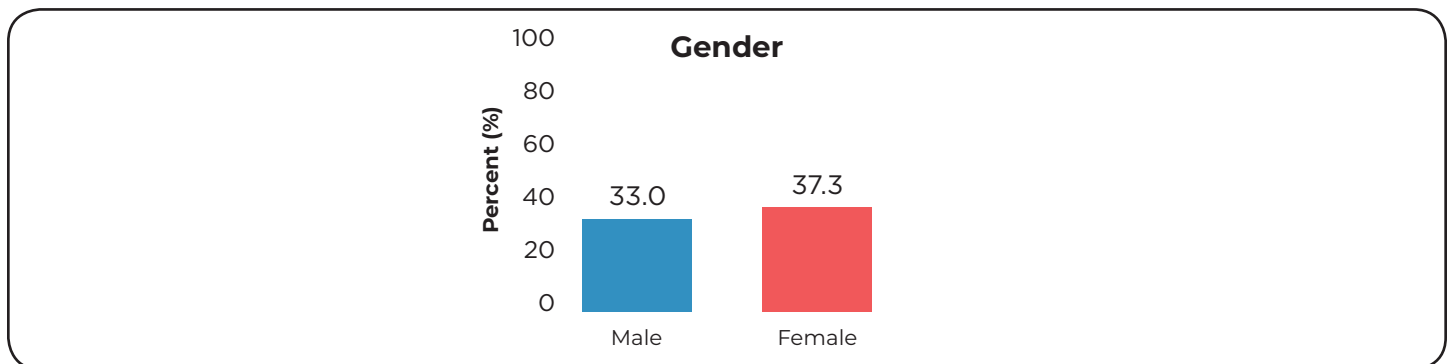


Figure 155. Percentage of Adults with Up-to date colon cancer screening (50-74yo), by Gender, in the CNMI, 2023



Any Colon Cancer Screening

Figure 156. Percentage of Adults with Up-to date colon cancer screening (50-74yo), by Age, in the CNMI, 2023

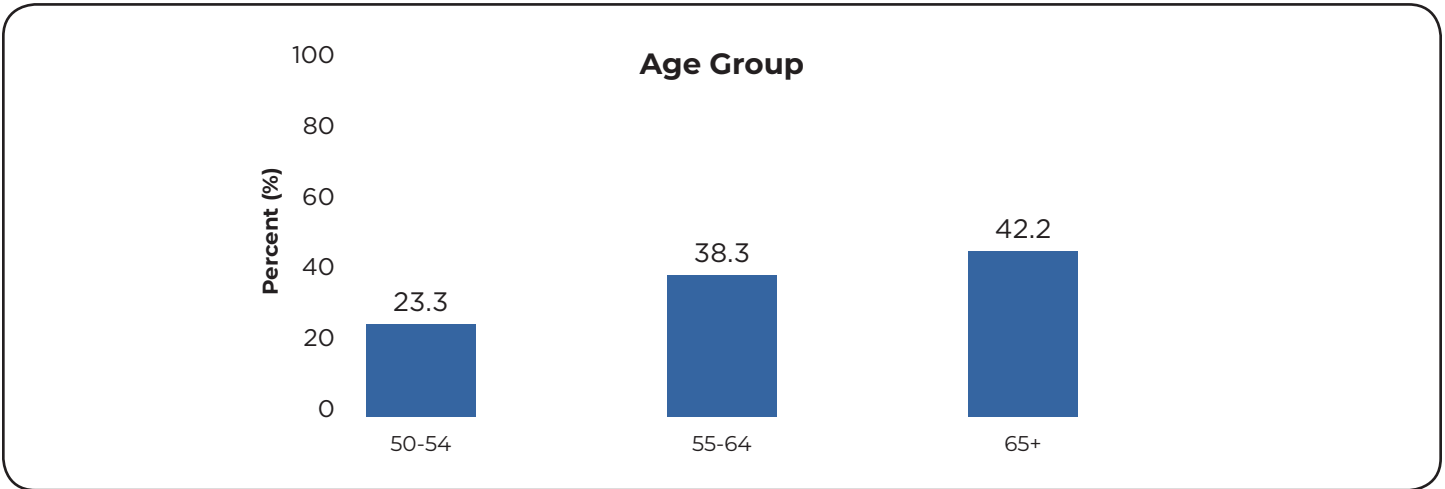


Figure 157. Percentage of Adults with Up-to date colon cancer screening (50-74yo), by Education, in the CNMI, 2023

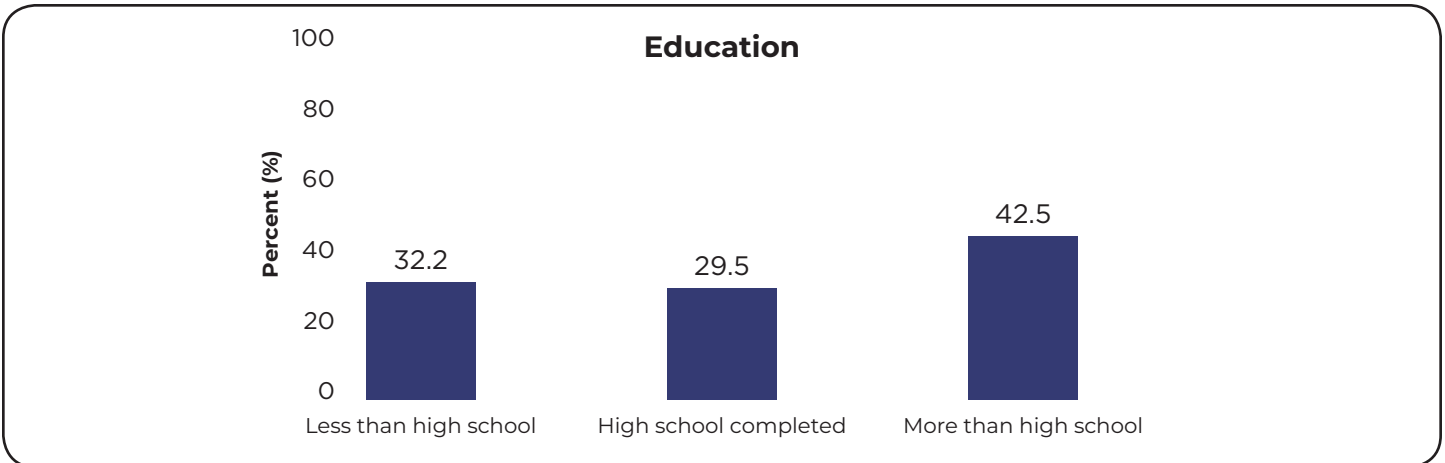
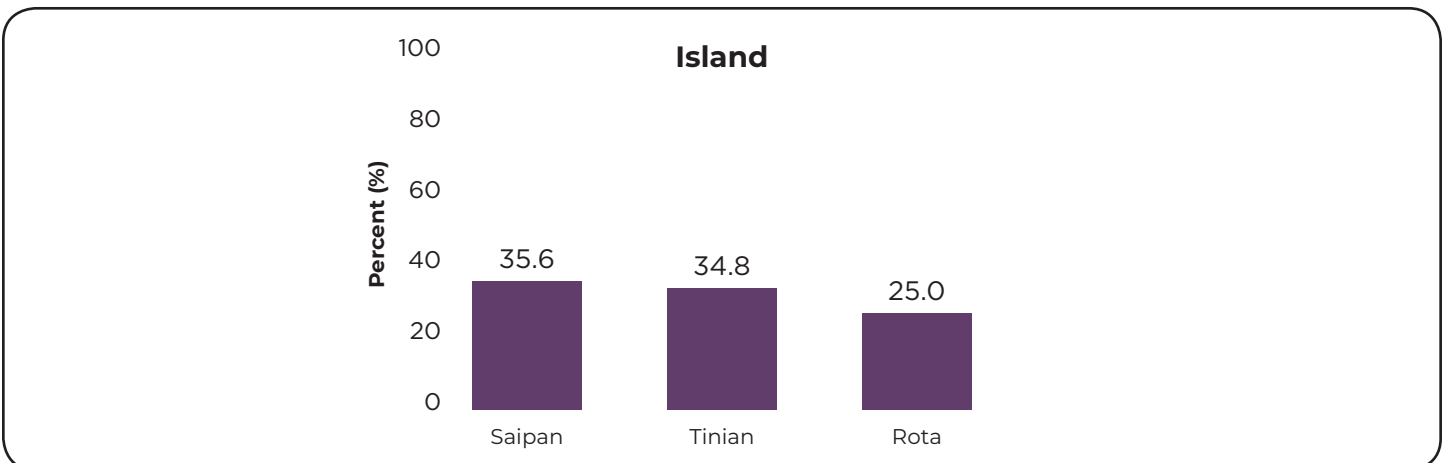


Figure 158. Percentage of Adults with Up-to date colon cancer screening (50-74yo), by Island, in the CNMI, 2023



Female Cancer Screening: Mammogram

About 2 out of 5 (43.2%; 95% CI: 38.2%-48.2%) of women aged 50-74 years in the CNMI have received a mammogram in the past two years per US Preventative Task Force (USPTF) recommendation; 32.6% have never had a mammogram. Having an up-to-date mammogram was significantly higher among women with more than a high school education, and Filipino women.

Figure 159. Percentage of women who received a Mammogram in past 2 years (50-74yo), by Ethnicity, in the CNMI, 2023

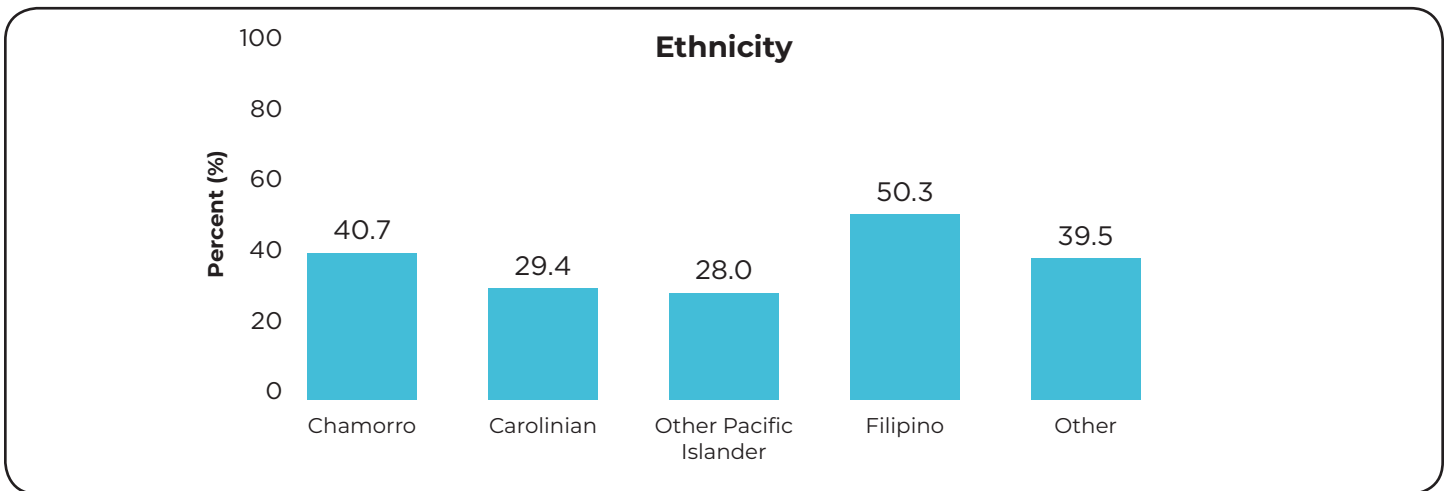
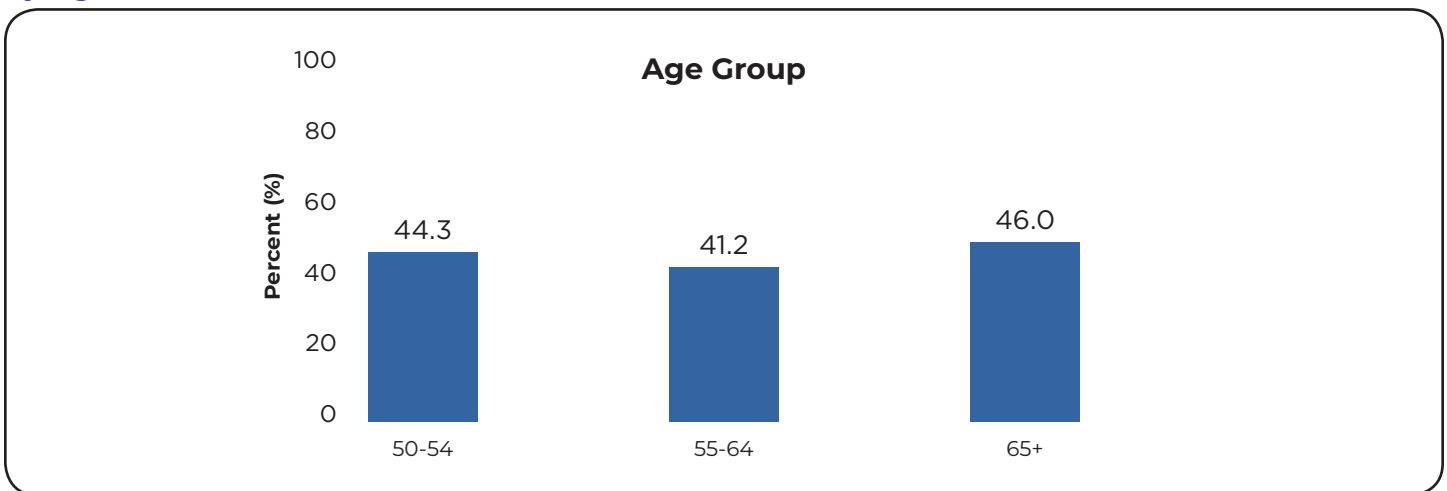


Figure 160. Percentage of women who received a Mammogram in past 2 years (50-74yo), by Age, in the CNMI, 2023



Female Cancer Screening: Mammogram

Figure 161. Percentage of women who received a Mammogram in past 2 years (50-74yo), by Education, in the CNMI, 2023

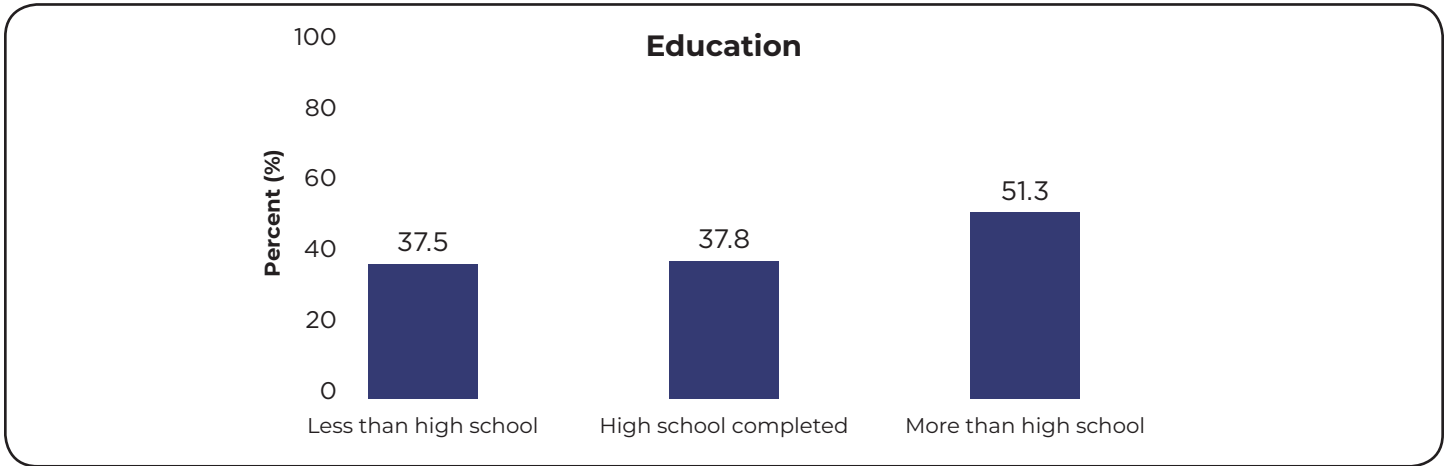
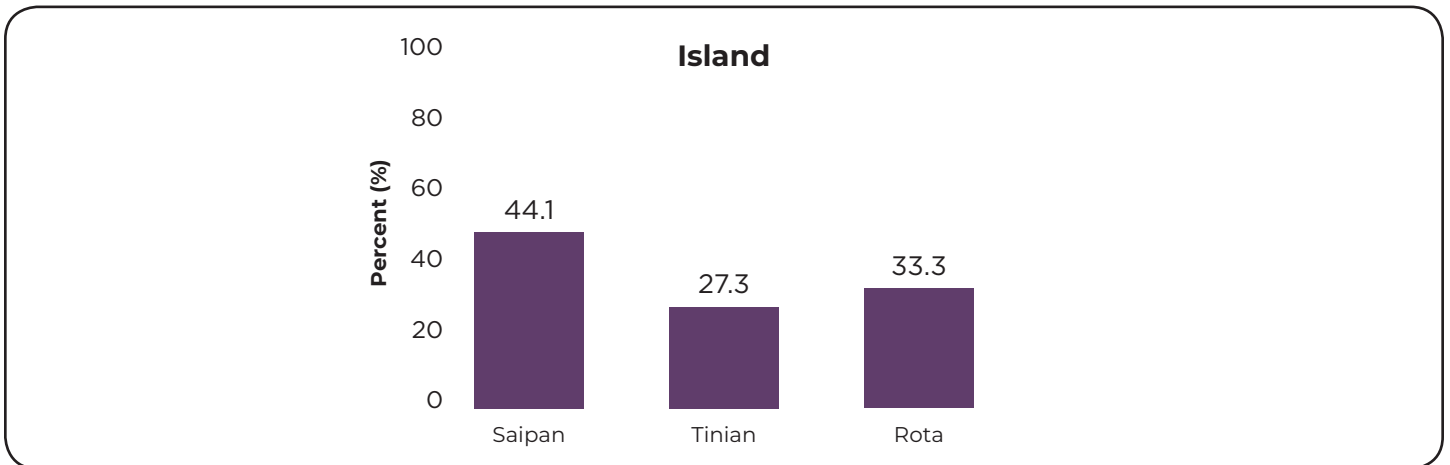


Figure 162. Percentage of women who received a Mammogram in past 2 years (50-74yo), by Island, in the CNMI, 2023



Female Cancer Screening: Pap Smear

Over half (55.1%; 95%CI: 51.5%-58.7%) of women aged 21-65 years in the CNMI had a pap smear in the past 3 years (per USPTF recommendation); 21.6% have never had a pap smear. Having an up-to-date pap smear was significantly higher among women 25-44 years old, women with more than a high school education, and Filipino women.

Figure 163. Percentage of women who received a Pap Smear in past 3 years (21-65yo), by Ethnicity, in the CNMI, 2023

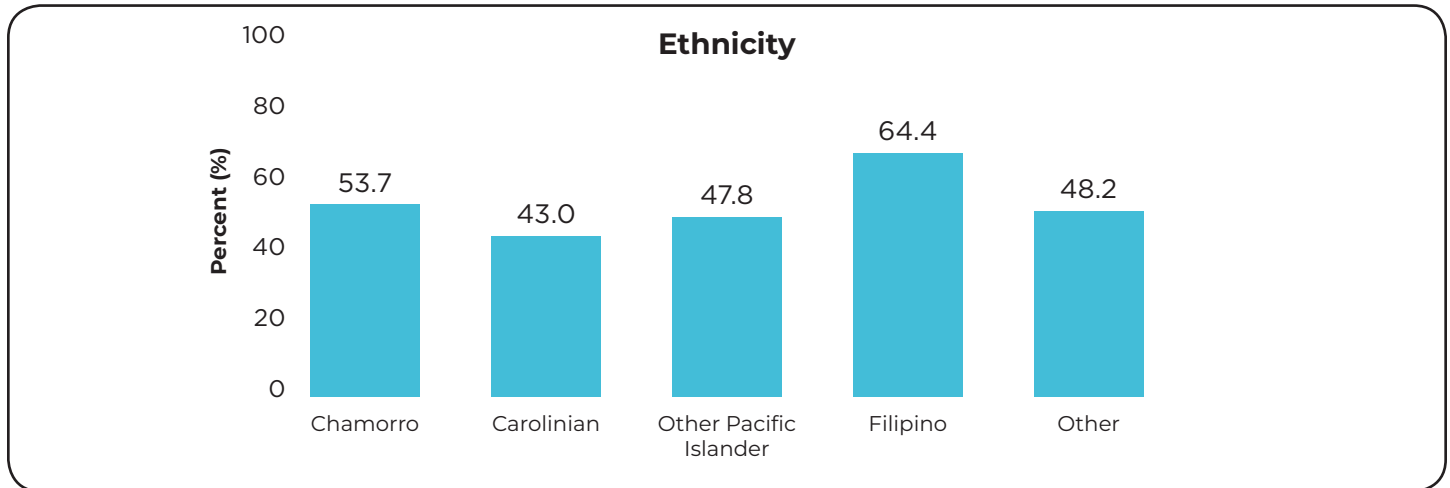
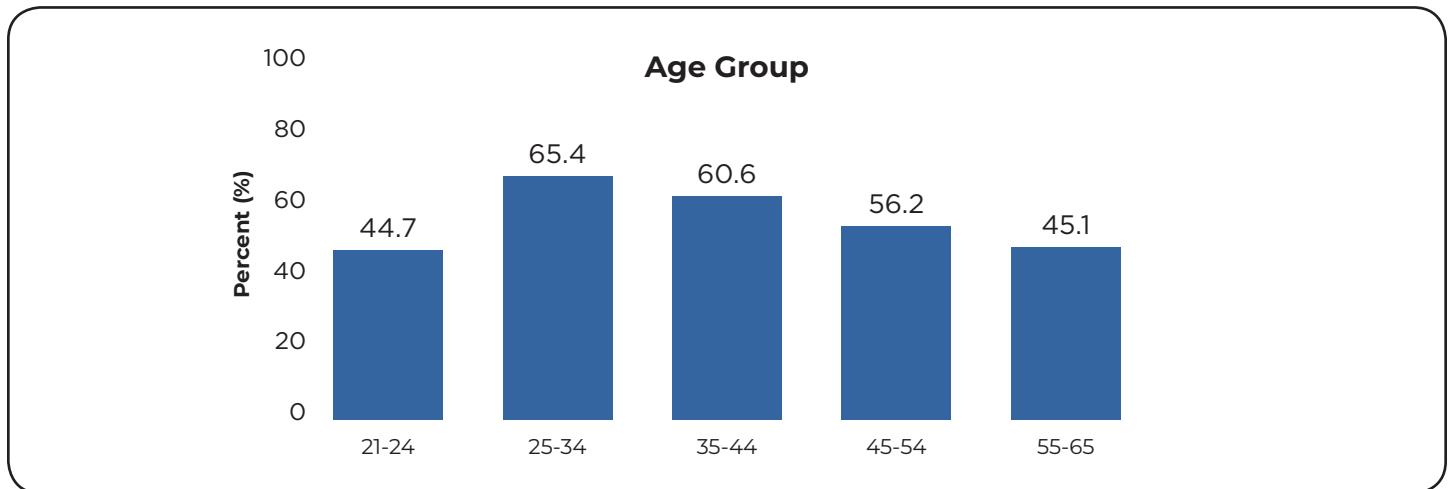


Figure 164. Percentage of women who received a Pap Smear in past 3 years (21-65yo), by Age, in the CNMI, 2023



Female Cancer Screening: Pap Smear

Figure 165. Percentage of women who received a Pap Smear in past 3 years (21-65yo), by Education, in the CNMI, 2023

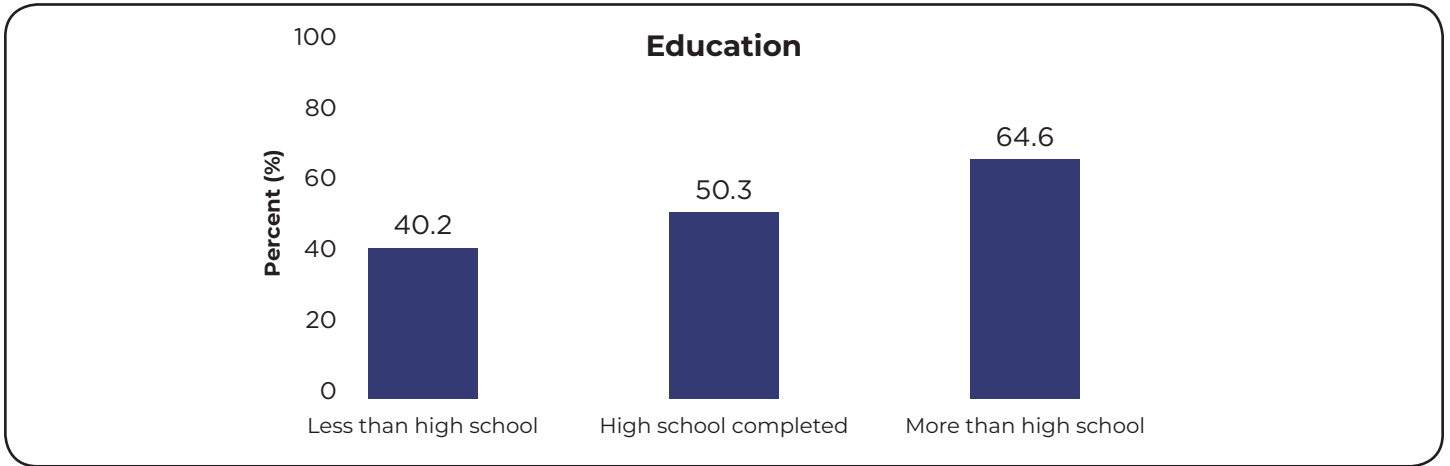
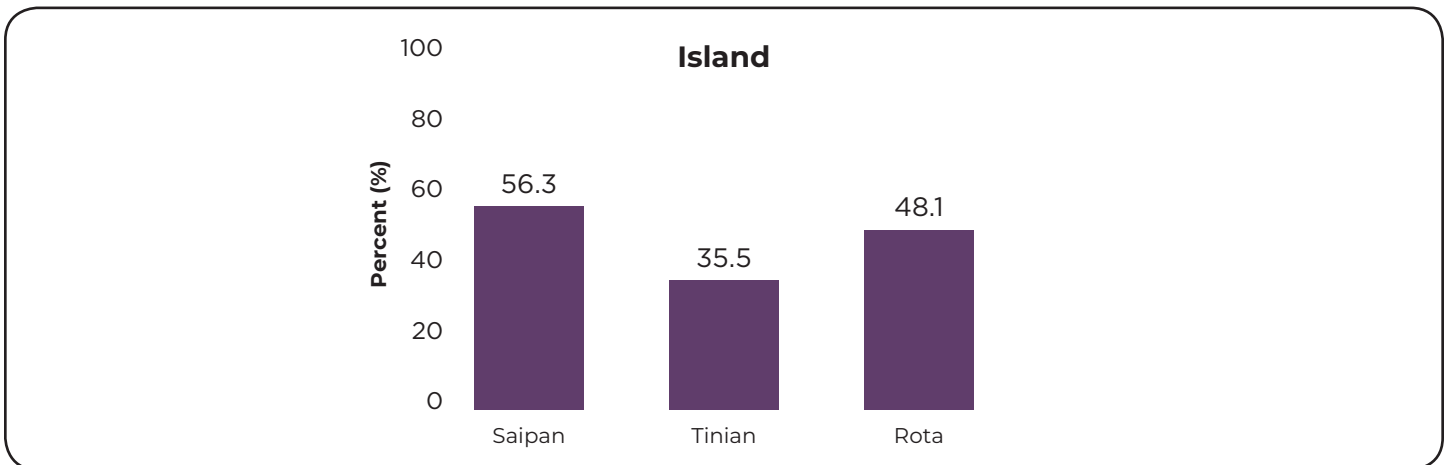


Figure 166. Percentage of women who received a Pap Smear in past 3 years (21-65yo), by Island, in the CNMI, 2023



Human Papilloma Virus (HPV) Vaccination

About 1 out of 5 (21.5%; 95%CI: 19.4%-23.8%) adults in the CNMI self-reported receiving Human Papilloma Virus (HPV) vaccination. Vaccination was significantly higher among women, those aged 25-34, those residing in Rota, and Chamorro and Other Pacific Islander populations.

Figure 167. Percentage of Adults who received HPV vaccination, by Ethnicity, in the CNMI, 2023

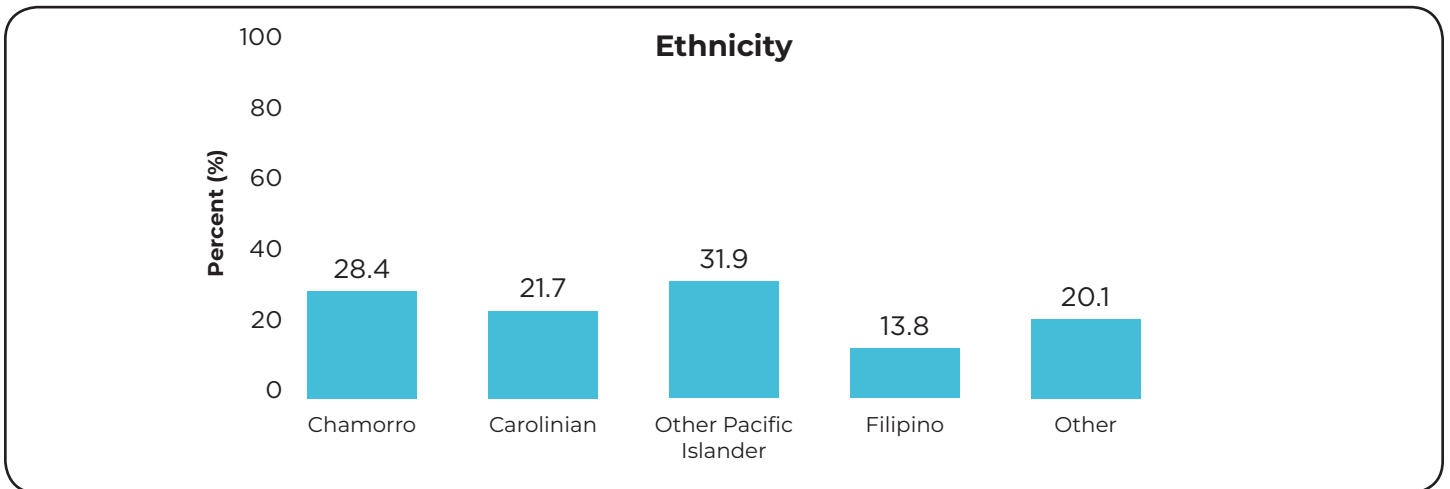
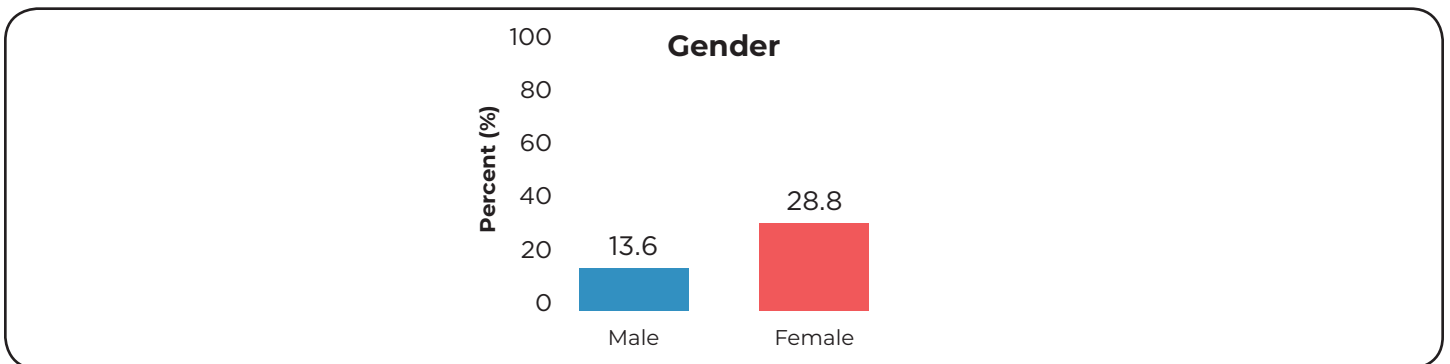


Figure 168. Percentage of Adults who received HPV vaccination, by Gender, in the CNMI, 2023



Human Papilloma Virus (HPV) Vaccination

Figure 169. Percentage of Adults who received HPV vaccination, by Age, in the CNMI, 2023

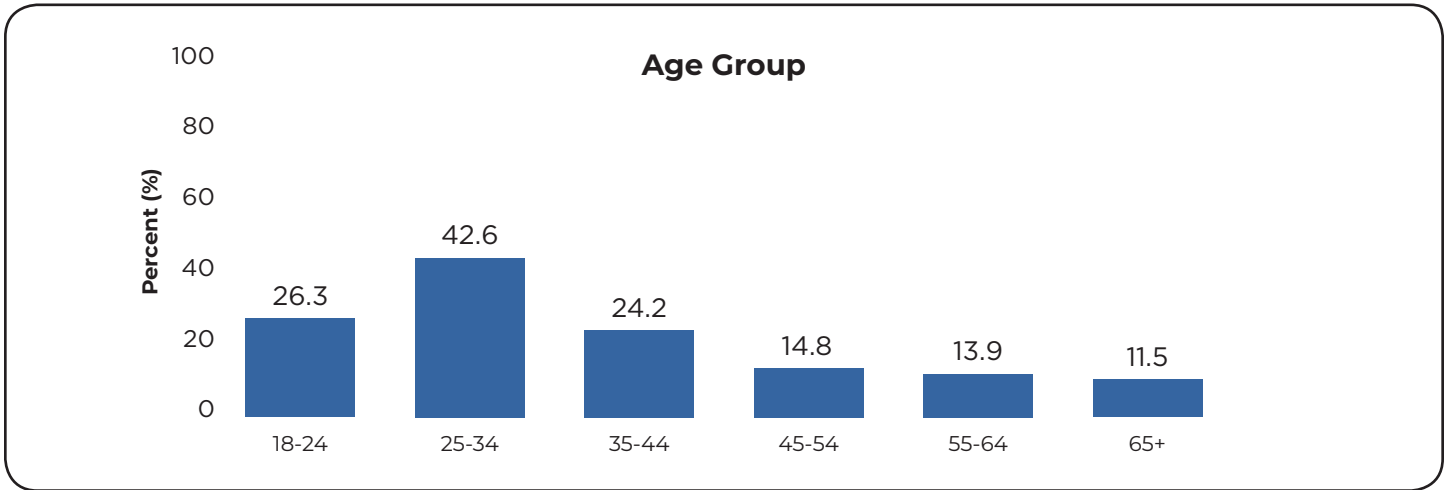


Figure 170. Percentage of Adults who received HPV vaccination, by Education, in the CNMI, 2023

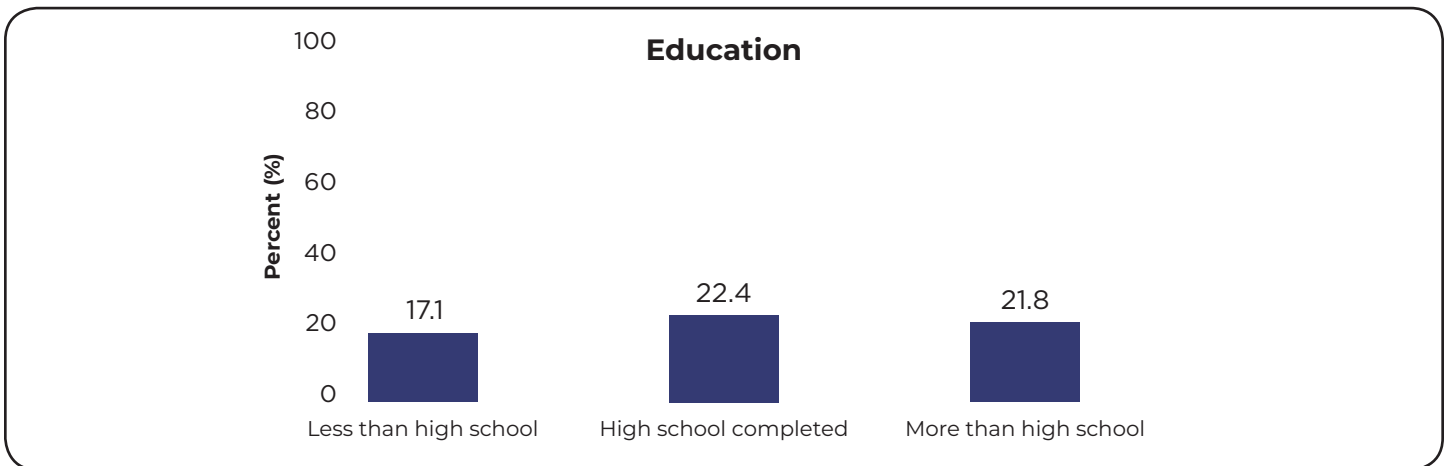
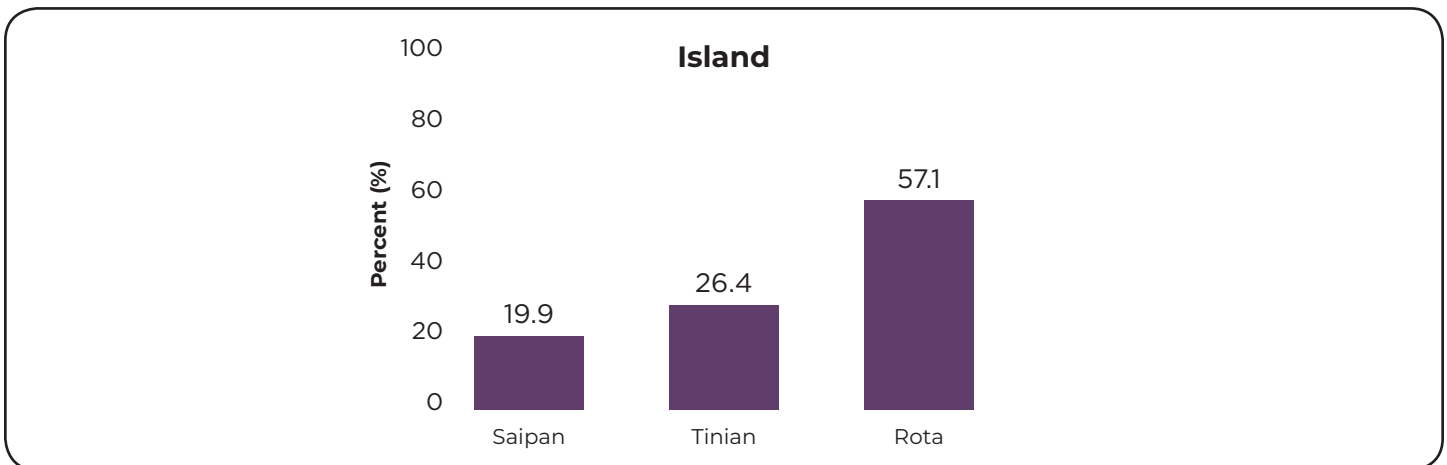


Figure 171. Percentage of Adults who received HPV vaccination, by Island, in the CNMI, 2023



Important notes about the survey

Limitations:

- A good portion of the data collected are self-reported, thus bias may exist, specifically regarding the more sensitive about substance use and mental health. Therefore, certain indicators may be under-reported.
- The sample was a bit older and more female than the last Census population estimates. However, the data were not weighted because the most recent Census data were several years old.
- There may have been issues around health literacy in the CNMI, especially among those who speak English as a second language, therefore impacting some responses.

Strengths:

- Physical and biochemical measurements were conducted for NCD prevalence estimation rather than just self-report.
- Quality and thorough training was provided for all surveyors over 3 days.
- Use of tablets ensured data collection was clean, efficient, and timely.
- There were successful partnerships and collaboration between internal and external stakeholders.
- There was substantial support from local leadership.

Challenges:

- Using meter numbers for household sampling presented some challenges due to the fact that some households share meters or have multiple meters.
- Some surveyors initially skipped some of the physical and biochemical measurements to make surveying easier. Thankfully this issue was resolved early on through tracking missing data on these measurements by individual surveyor.
- Some surveyors initially did not follow Kish methodology for random participant selection within a household and instead surveyed whoever volunteered. Thankfully this issue was resolved early on through tracking demographics of those surveyed by individual surveyor.

Discussions and Recommendations

This adult Hybrid Survey provides much needed information about the status of NCDs and risk factors in the CNMI, which complements data from youth school surveys (that provide a picture of how well we are protecting youth from development of habits that will make them sick in the future) and death rates (that give a picture of the final impact of NCDs).

Comparing the results of the present survey with data from the US helps to paint a picture of health disparities that exist between the CNMI and the US. Based on these comparisons, it is evident that almost all health indicators are significantly more alarming in the CNMI compared to the US. However, when the trend data from 2016 to 2023 are examined, there were improvements within the CNMI regarding health access including improvements to having a medical check-up in the past year, having healthcare coverage, avoiding care due to cost, having a dental screening in the past year, having teeth extracted due to decay/disease, and having up-to-date pap smears and mammograms among appropriately aged women. Although there was an improvement in tobacco smoking, there were significant increases in chewing betel nut with tobacco and vaping prevalence. For non-communicable diseases, there was a significant decrease in the hypertension prevalence, but the overweight/obesity prevalence increased by 8% of the adult population, and the diabetes prevalence increased by 7% of the adult population. Accordingly, the percentage of adults consuming 5 or more servings per day of fruits and vegetables significantly decreased.

To have a better understanding of the health status of adults in the CNMI, it's essential to note significant events that may have contributed to NCD's and related risk factors between 2016-2023. Many health disparities showcased in this report have direct correlation to the environmental and social political events experienced in the CNMI in the past several years. Global warming has affected all the Pacific Islands resulting in harsh weather events. This caused category 5 Super Typhoon Yutu in 2018, leaving over 250 families without adequate shelter for several months, some even close to a year, Saipan and Tinian without power for 3-4 months and school buildings destroyed, resulting in schools transitioning to remote learning. The CNMI was in the post-disaster recovery phase in 2019 when word of a novel influenza virus was making its way around the region in December of 2019. In 2020, while the CNMI government, including the CHCC health system were entrenched in addressing and rebuilding damages caused to the local infrastructure by Super Typhoon Yutu the COVID-19 Pandemic was declared. COVID-19 caused many entities to close or reduce hours of operation resulting in approximately 30% of the CNMI workforce to be furloughed or laid off. Amid addressing COVID-19, the island of Rota also experienced typhoon trauma. These events allowed residents of the CNMI to receive expanded federal assistance, especially for food and ready-made meals. Although this was much needed, many households were purchasing unhealthy foods because they were cheaper and/or non-perishable. Most popular food sales include rice, canned goods and ready-made meals, or 'bentos'.

Discussions and Recommendations

Much effort has been given to control of NCDs in the CNMI, especially in health promotion, education, and delivery of health services. It is now clear, however, that more needs to be done to address the concerning rise in overweight/obesity and diabetes prevalence. There is a need to adopt a whole society approach for reducing the burden of NCD's at the macro level, adopting evidence-based interventions and practices that improve a wider scale of community health outcomes. Such interventions and practices include policy, systemic and environmental change initiatives, community and clinical linkages, and strengthening of a multi-faceted stakeholder NCD Task Force and partnerships.

The Monitoring Alliance for NCD Action (MANA) Dashboard for the CNMI shows the status of adoption of the critical, evidence-based policies and programs that are known to be effective in controlling NCDs. This dashboard shows that there is much “unfinished business” in adopting policies that protect the community, especially youth, from the risk factors that cause NCDs. The MANA Dashboard was developed by the Secretariat of the Pacific Community (SPC) in collaboration with the World Health Organization and the Heads of Health from all the Pacific Island Countries/Jurisdictions/Territories.

From the MANA Dashboard, the list of policies that need adoption or strengthening for tobacco include working on tobacco industry interference, restricting tobacco advertising, promotion, and sponsorship, and expanding existing policies to include vaping. To combat obesity and diabetes, strategies that need to be focused on include excise taxes on unhealthy foods (especially sugar-sweetened beverages and processed meats), banning of trans fats, restrictions on marketing of unhealthy foods to children, strong healthy food policies in schools, issuing of dietary guidelines, and stronger enforcement of NCD policies.

Furthermore, the World Health Organization (WHO), Center for Disease Control and Prevention (CDC) and the United Nations have developed national and global standards and benchmarks that are suggested to curb the incidence and prevalence of chronic diseases and related risk factors. Standards include the following:

- WHO Global NCD Monitoring Framework
- WHO NCD Best Buys, which supports the MANA Dashboard
- Sustainable Development Goals- Green Growth
- CDC Social Determinants of Health for NCD's
- CDC Policy, Systems, Environmental Change Guidance

Although the CNMI continues to work diligently on chronic disease prevention and control, much more needs to be done.

Discussions and Recommendations

In addition to adopting aggressive policies to control NCD risk factors, the results of this survey indicate that there is a large “protection gap” in the delivery of health services designed to screen for and control the damage done by NCDs. The findings of this survey indicate that only 13% of people with diabetes and 21% of those with hypertension have their disease under good control, and many adults do not have up-to-date cancer screening (65% for colon cancer, 57% for breast cancer, and 45% for cervical cancer). Aggressive efforts are needed to assure that most adults receive the screening services they need for cancer prevention, and to provide the follow-up and care that those with diabetes and hypertension need to protect them from complications and death.

Recommendations:

1. Assure that the Hybrid Adult Survey will be conducted every 5 years, in accordance with the NCD Monitoring & Surveillance Plan (next due in 2028).
2. Develop a CNMI NCD Strategic Plan that encompasses risk and protective factors and measures.
3. Use the MANA Dashboard as the basis for developing a policy agenda and tracking progress to more effectively address NCDs risk factors, especially overweight/obesity and tobacco use in the CNMI.
4. Develop a strategy across health service agencies to monitor care delivery, provide expanded outreach, tracking, and accessible services for care of patients with NCDs.
5. Provide appropriate services and support for substance use and mental health.

Priority areas for health improvement in the CNMI include:

1. Collaborate with the community to improve policy, systems and environmental activities that will lead to the reduction of NCD's on a larger population scale.
2. Reducing diabetes by improving diet/nutrition education and healthy food access and increasing physical activity using evidence-based programs/initiatives.
3. Strengthening NCD clinical screening and management programs among adults in the CNMI.
4. Providing appropriate cessation services for substance use, specifically tobacco and alcohol.
5. Consider policy approaches to reduce certain risk factors, especially those in the Monitoring Alliance for NCD Action (MANA) framework.
6. Support chronic disease self-management programs to help individuals with NCDs control their disease.
7. Securing local funding mechanisms to improve public health interventions and environmental factors.

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