

Guam State Epidemiological Profile

2018 Update

**Dr. Annette M. David, on behalf of the Guam State
Epidemiological Outcomes Workgroup (SEOW)**

ACKNOWLEDGEMENTS

This profile resulted from the collaborative efforts of the various agencies and institutions that comprise the Guam State Epidemiological Outcomes Workgroup (SEOW). The data contained in this profile were contributed by the members of the SEOW from primary sources within each institution. Dr. Annette M. David, SEOW Lead, oversaw the data analysis and was the primary author for this report. Ms. Audrey Benavente from Guam Behavioral Health and Wellness Center (GBHWC) oversaw data collection, data collation and data management, and provided support for the SEOW. The GBHWC Prevention Education and Community Empowerment (PEACE) staff, under the supervision of Prevention and Training Branch Supervisor Ms. Linda Flynn provided administrative support.

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**GUAM STATE EPIDEMIOLOGICAL OUTCOMES WORKGROUP
(SEOW)**

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Juvenile Drug Court, Superior Court of Guam	Cerina Mariano Mary Grace Lapid Rosadino	SEOW Members
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Guam Community College	Dr. Ray Somera	SEOW Member
Guam's Alternative Lifestyle Association (GALA)	Evan San Nicolas Tim de la Cruz	SEOW Member SEOW Member
Guam Memorial Hospital	To be designated	SEOW Member
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University of Guam Cooperative Extension Services (UOG-CES)	Peter Barcinas	SEOW Member
University of Guam Cancer Research Center	Dr. Yvette Paulino	SEOW Member
Sanctuary, Incorporated	To be designated	SEOW Member

KEY FINDINGS

Substance Abuse

Tobacco

- Tobacco consumption remains higher in Guam than in the US, for both adults and youth.
- Smoking is declining, but Guam still has one of the highest smoking prevalence rates across the various States and Territories. Males smoke more than females; adult female smoking in Guam is similar to male smoking in the US.
- Tobacco use displays marked disparities across socio-economic gradients; the poor and less educated tend to smoke more. Conversely the rich and well educated are more likely to have never smoked.
- Smokeless tobacco use among adults is nearly double the US rate, and smokeless tobacco use among Guam youth is almost triple the US rate. Micronesians have the highest rates of smokeless tobacco consumption.
- Electronic cigarette use, or “vaping” is high among our youth: One in four (26.5%) of high school students and nearly one in four (23.5%) of middle school students reported current use.
- Tobacco-related diseases are the major cause of death in Guam today.
- Tobacco control policies are closely associated with reductions in smoking prevalence and smokeless tobacco use.

Alcohol

- Current alcohol use is lower in Guam than in the US, but unsafe alcohol use (binge drinking and heavy drinking) among Guam adults surpasses the US rate.
- Current and binge drinking among Guam youth were increasing until alcohol taxes were increased in 2003. A further reduction was noted in 2011, following passage of the law that raised the minimum legal drinking age.
- Unlike tobacco, and binge drinking among adults, there is no difference in binge drinking rates across the sexes for Guam youth. Micronesian youth have the highest binge drinking prevalence.
- Alcohol-related arrests comprised 16% of all arrests cleared in 2017. Alcohol was a factor in 17% of all traffic-related deaths in 2017.
- Alcohol control policies appear to be related to declines in adult and youth binge drinking.

Illicit Drugs

- One in 4 high school students in Guam is a current user of marijuana. Current and lifetime marijuana use among Guam students are higher than the US median.
- In 2016, 5.7% of adults reported illicit drug use other than marijuana. About 5% of adults reported taking prescription drugs that were not prescribed for them.
- About 5% of Guam high school students report having tried methamphetamines. Seventeen percent reported using synthetic marijuana. About 5% reported taking a prescription drug without a doctor’s prescription.
- In 2017, about 40% of high school youth reported they had been offered, sold or given an illicit drug on school property.

Suicide

- The age-adjusted 2018 suicide rate in Guam is 31.3 per 100,000, which is markedly higher than the US rate.

- Suicide deaths in Guam occurred predominantly among younger people. From 2009 to 2018, about 52% of all suicides occurred in those under 30 years of age.
- Chuukese and CHamorus have the highest ethnicity-specific suicide rates.
- Most suicides in Guam occurred at home; hanging is the predominant method.
- Guam youth have an elevated likelihood of suicidal ideation and attempts than their US counterparts.
- Alcohol use, mental illness and exposure to violence have been linked to suicide deaths.

Mental Illness

- Almost 8% of Guam adults reported being told they had depression in 2018.
- In 2016, symptoms of mental illness were more prevalent among Micronesians, those with lower income and lesser education.
- Persistent sadness among Guam high school students is significantly higher than the US median.

INTRODUCTION

Effective prevention requires a foundation of good data.

In 2003, Guam was awarded a Strategic Prevention Framework-State Incentive Grant (SPF-SIG) for substance abuse prevention and control by the Substance Abuse and Mental Health Services Administration's (SAMHSA) Center for Substance Abuse Prevention (CSAP). Utilizing the principles of outcomes-based prevention, the grant specified the creation of a State Epidemiological Outcomes Workgroup (SEOW), which would oversee the strategic use of data to inform and guide substance abuse prevention policy and program development on Guam. Guam's SEOW was subsequently established in 2004. Throughout 2005, the SEOW undertook a data inventory, and collated and reviewed data on substance abuse consumption patterns and consequences. The first Guam State Epidemiological Profile (Epi Profile) on substance abuse and consequences was published during the 3rd quarter of 2007. Subsequent updates to the profile were published in 2008 and 2009. The SPF-SIG formally ended in 2010.

In 2008, the Guam Behavioral Health and Wellness Center (GBHWC, formerly known as the Department of Mental Health and Substance Abuse or DMHSA) successfully applied for a SAMHSA Garrett Lee Smith (GLS) youth suicide prevention grant. The three-year grant, entitled *Focus on Life*, ran from September 2008 to September 2011. One of the grant's objectives was to strengthen and enhance suicide data collection, surveillance and analysis. This was assigned to the SEOW, which released Guam's first Suicide Profile in January 2009. Two updates were published in April 2010 and September 2011. The suicide prevention grant ended on September 2011. In late 2010, Synectics, a SAMHSA contractor, awarded a sub-grant to Guam to sustain the SEOW through 2014. The 4th Epi Profile and 1st Community Profile were published in 2012 followed by the 5th Epi Profile and 2nd Community Profile in 2013. Subsequently, the Partnerships for Success grant provided funding that permits the SEOW's work to continue to the present time (Figure 1).

The Guam SEOW is the longest-running data work group in Guam. It is considered the definitive authority on substance abuse epidemiology on the island. Its data products are readily acknowledged as comprehensive community resources, and its work has consistently influenced substance abuse policy and program development, prevention resource allocation, service delivery and decision-making at the State government level as well as within individual agencies, institutions, and community organizations.

This Profile represents the work done by the various SEOW members in conjunction with the Governor's PEACE Council and the GBHWC Prevention and Training staff. It documents an ongoing process of data collation and surveillance, with an expanded scope that includes not just data on tobacco, alcohol and other drugs of abuse but also suicide and mental health. Through this publication and its continuing work, the SEOW will continue to provide the local evidence base for effective substance abuse prevention and mental health promotion in Guam.

Figure 1. Growth of Guam's Prevention Data Products from SEOW

Guam's Prevention Data

2012-2013

- 4th Epi Profile, 1st Community Profile 2012
- 5th Epi Profile, 2nd Community Profile 2013

2008-2009

- 2nd Epi Profile 2008
- 3rd Epi Profile 2009
- FOL Grant 2008
- 1st Suicide Profile 2009

2004-2005

- SEOW started in 2004
- Data inventory started 2005



2015-Present

- 6th Epi Profile 2015
- 7th Epi Profile 2018
- 8th Epi Profile 2020

2010-2011

- SPF-SIG ended 2010
- 2nd Suicide Profile 2010
- 3rd Suicide Profile 2011
- FOL ended 2011

2006-2007

- 1st Epi Profile

2003

- SPF-SIG awarded to Guam

BACKGROUND

Geographic, Political, and Economic Context

Guam, “where America’s day begins,” is one of seventeen Non-Self-Governing Territories listed by the Special Committee on Decolonization of the United Nations. Located in the western North Pacific Ocean, it houses one of the most strategically important US military installations in the Pacific. Guam also serves as a critical crossroads and distribution center within Micronesia and the rest of the Pacific, as well as Asia, because of its air links (Figure 2). This plays a significant part in the movement of tobacco, alcohol and illicit drugs into the island.

The island has a land area of 549 sq. km., roughly three times the size of Washington, DC. The terrain is of volcanic origin, surrounded by coral reefs. The climate is tropical marine, with little seasonal temperature variation. There are frequent squalls during the rainy season and, occasionally, potentially very destructive typhoons from June to December.

Guam is an organized, unincorporated territory of the US with policy relations under the jurisdiction of the Office of Insular Affairs, US Department of the Interior. The island’s Governor and Lieutenant Governor are elected on the same ticket by popular vote and serve a term of four years. The legislative branch is served by a unicameral Legislature with 15 seats; the members are elected by popular vote to serve two-year terms. Currently, the Democratic Party holds 10 seats while the Republican Party holds 5. Guam also elects one nonvoting delegate to the US House of Representatives to serve a two-year term. The current representative, Congressman Michael San Nicolas, belongs to the Democratic Party. The judicial branch was revamped to create the Unified Judiciary of Guam, consistent with the Organic Act. Guam has the District Court of Guam (federal) and the Supreme Court of Guam and the Superior Court of Guam (local).

Key Indicators

Population (2018 est.):
165,177

Ethnic groups:
CHamoru – 37%
Filipino – 26%
Chuukese – 7%
Caucasian – 7%

Age structure:
41% under 25 years

Median age:
29 years

Birth rate:
20 births/1000 (2017)

Death rate:
6/1,000 (2017)

Life expectancy (2017):
Male: 73.6 years
Female: 78.6 years

Unemployment rate:
5.8% (Sept 2017)

Population below poverty:
23% (2010)

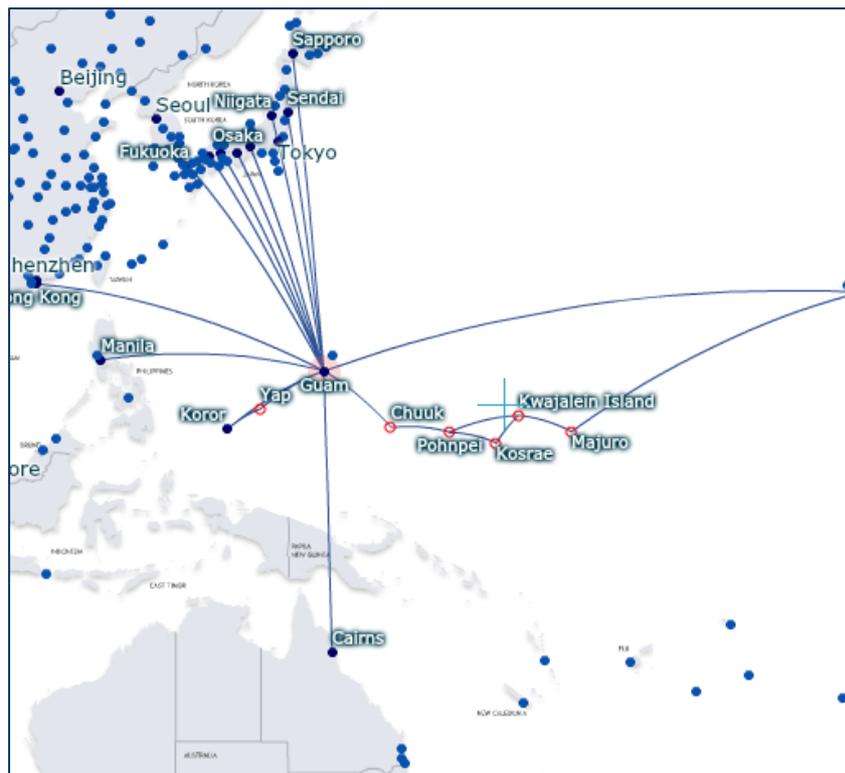
GDP per capita:
\$32,105 (2017)

Household mean income:
\$49,263 (2010)

Mobile phones in use:
181,000 (2016 est.)

Internet users: 127,000 -
77% of population (Jan 2018)

Figure 2. Regional map showing Guam's air routes to key countries



Source: <http://travelisfree.com/2013/03/09/the-pacific-hopper-with-miles/>, last accessed 07 March 2018

Guam's economy relies heavily upon federal support, military spending and tourism. In 2017, 34% of the Gross Domestic Product (GDP) derived from US federal spending (defense and non-defense) in the amount of \$1.905 billion. Service exports, mainly spending by foreign tourists while on Guam, amounted to \$1.036 billion in 2017, and comprised 18% of GDP. In 2017, the island's economy grew by 1.1%. National defense spending cushions the island's economy against fluctuations in tourism.

Tourism is a major industry. There were over 1.545 million visitor arrivals in 2017 (air and sea), a 0.6% increase from the previous year. Korea has overtaken Japan as Guam's major tourist market, accounting for 45% of visitors air arrivals (up from 36% of tourist air arrivals in 2016). Japan accounts for 41% of the market (down from 49% in 2016) (Table 1). Because much of the economy depends on tourism, the policy and program environment, especially in relation to tobacco and alcohol, is influenced by perceptions of acceptability by the tourist market.

Table 1. Visitor air arrivals by country of residence, Guam, 2010-2017

Country	2017	2016	2015	2014	2013	2012	2012	2010
Total	1,522,351	1,517,432	1,400,397	1,330,721	1,328,761	1,298,641	1,150,201	1,187,831
Japan	620,376	745,680	773,019	808,856	893,118	929,229	824,005	893,716
United States	77,077	77,706	70,246	68,763	58,582	62,618	61,348	61,381
CNMI/Micronesia	36,306	34,710	29,046	27,943	29,810	31,357	33,184	35,521
Taiwan	32,505	42,229	41,905	49,136	48,653	49,144	45,086	31,320
Philippines	19,132	21,652	12,427	12,079	10,920	10,483	10,097	12,358
Korea	685,228	544,964	427,900	308,037	245,655	182,829	149,076	134,692
Hong Kong	14,745	9,377	8,406	8,180	8,857	8,609	8,903	6,890
Other	36,982	41,114	37,447	47,727	33,166	24,372	18,502	14,953

Source: Guam Visitors Bureau data as reported in Guam Statistical Yearbook 2017

Note: This includes military and civilian air arrivals. It excludes visitors arriving by sea.

CNMI/Micronesia = Commonwealth of the Northern Mariana Islands/Micronesia

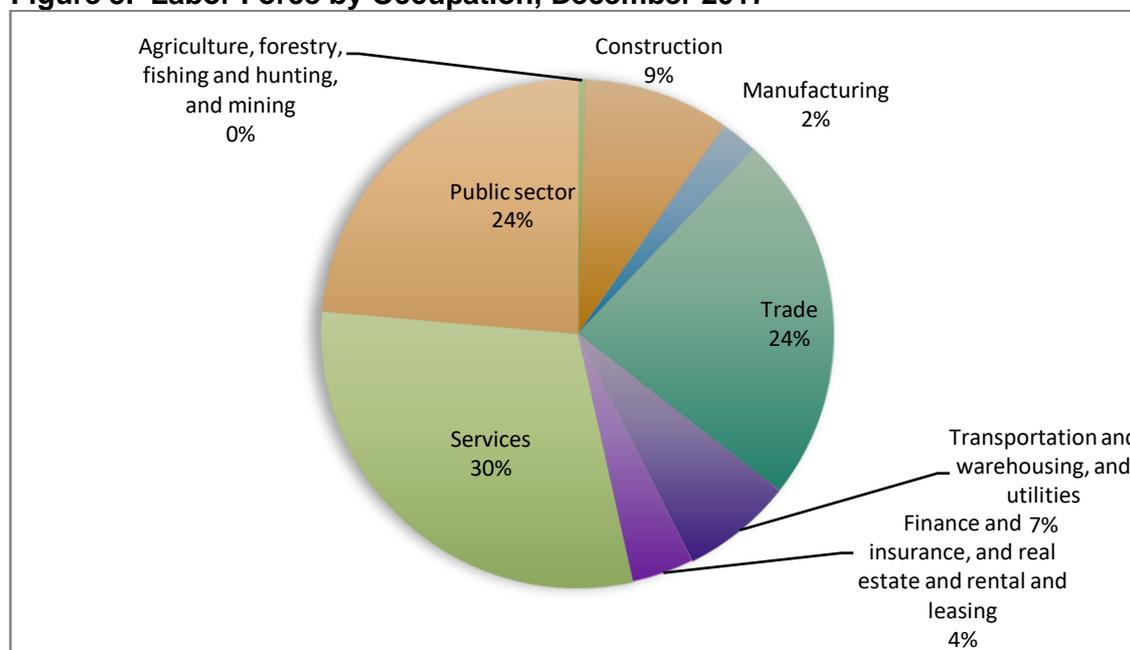
As of September 2017, there were 72,510 people in the civilian labor force, of whom 69,360 were employed. 5.8% were unemployed in September 2017, as compared to 5.4% in September 2016 (Table 2). Figure 3 shows the different sectors of employment and distribution of the labor force as of December 2017. Majority of the labor force are employed in services (30%), trade (24%), and the public sector (24%).

Table 2. Employment status, population 16 years and older, Guam, 2013-2017

EMPLOYMENT STATUS	2017	2016	2015	2014	2013
Total population 16+:	122,540	122,170	121,600	121,580	121,570
In labor force:	71,600	71,960	73,120	74,870	70,490
Employed:	67,470	68,050	69,660	69,110	64,550
Unemployed	4,130	3,910	3,550	5,760	5,940
Not in labor force:	50,940	50,210	48,390	46,710	51,080

Source: Bureau of Labor Statistics, Department of Labor as reported in the Guam Statistical Yearbook 2017

Figure 3. Labor Force by Occupation, December 2017



Source: Bureau of Labor Statistics, Department of Labor as reported in the Guam Statistical Yearbook 2017

In 2010, the year for which the latest data are available, there were 44,664 households on Guam. Median household income increased from 2008 to 2010 (Table 3). In 2010, 19.9% of Guam's households lived on \$14,999 or less per year. This is unchanged

from 2008, when nearly 20% of households made \$14,999 or less per year. The poorest of the poor comprised 7% of all households on Guam and lived on less than \$3000 per year. In contrast, 11.6% of households made more than \$100,000 per year.

Table 3. Household income, Guam, 2005-2010

Characteristic	2010	Percent	2008	Percent	2005	Percent
Households	44,664		46,246		40,298	
No Income	2,512	5.6	2,622	5.7	1,089	2.7
Less than \$3,000	619	1.4	760	1.6	537	1.3
\$3,000 to \$4,999	728	1.6	874	1.9	459	1.1
\$5,000 to \$6,999	655	1.5	760	1.6	344	0.9
\$7,000 to \$8,999	692	1.5	798	1.7	573	1.4
\$9,000 to \$10,999	1,347	3.0	1,178	2.5	1,261	3.1
\$11,000 to \$12,999	1,128	2.5	1,064	2.3	917	2.3
\$13,000 to \$14,999	1,238	2.8	1,330	2.9	1,261	3.1
\$15,000 to \$19,999	3,130	7.0	3,420	7.4	2,350	5.8
\$20,000 to \$29,999	5,242	11.7	6,346	13.7	5,274	13.1
\$30,000 to \$39,999	5,569	12.5	5,130	11.1	5,331	13.2
\$40,000 to \$49,999	4,040	9.0	5,054	10.9	4,471	11.1
\$50,000 to \$59,999	3,567	8.0	3,914	8.5	3,497	8.7
\$60,000 to \$69,999	3,058	6.8	3,078	6.7	3,038	7.5
\$70,000 to \$79,999	1,966	4.4	2,280	4.9	2,178	5.4
\$80,000 to \$89,999	2,439	5.5	1,748	3.8	1,834	4.6
\$90,000 to \$99,999	1,565	3.5	1,102	2.4	1,720	4.3
\$100,000 or more	5,169	11.6	4,788	10.4	4,127	10.2
Median Household Income	\$39,052	...	\$37,741	...	\$40,373	...
Mean Household Income	\$49,263	...	\$45,786	...	\$47,062	...
Average Household size	3.8	...	3.5	...	3.9	...
Average Earners per Household	1.7	...	1.5	...	2.2	...
Per Capita Income	\$12,864	...	\$13,089	...	\$12,768	...

Source: Guam Department of Labor as reported by the Bureau of Statistics and Plans, Guam Statistical Yearbook 2017

The economy of the island is dependent upon and influenced by the telecommunications infrastructure. Guam is a transpacific communications hub for major carriers linking the US and Asia. The island's telephone network is integrated with US facilities for direct dialing, including free use of 800 numbers. This enables Guam to tap into US-based phone networks for its cessation quit line and suicide help line.

There are 127,000 estimated Internet users in Guam, or roughly 77% of the population with Internet access. The 2016 estimate for fixed line (land line) telephone subscriptions was 68,000, for a rate of 42 subscriptions per 100 inhabitants. In contrast, mobile or cellular subscriptions numbered about 181,000, for a rate of 113 subscriptions per 100 inhabitants. This implies that phone-based surveillance should include mobile telephones, and the use of mobile technology for prevention messaging likely would yield the greatest reach within the population.

Population Demographics

The latest data from the 2010 Guam census indicates that as of April 1, 2010, Guam's population totaled 159,358, representing an increase of 2.9% from the 2000 Census counts. The actual population count was 12% lower than the projected 2010 population based on the 2000 census. Thus, rates calculated using the projected population counts based on the earlier 2000 census likely resulted in underestimates.

Table 4. Population estimate: 2000 to 2010

Year	Population	Year	Population
2000	154,805		
2001	156,337	2006	158,711
2002	157,061	2007	158,967
2003	157,579	2008	159,169
2004	158,024	2009	159,323
2005	158,398	2010	159,358

Sources: 2000 and 2010 Guam Census, as reported by the Bureau of Statistics and Plans, Guam Statistical Yearbook 2017

Table 5. Population projection: 2010 to 2020

Year	Population	Year	Population
2010	159,358		
2011	159,600	2016	162,742
2012	159,914	2017	163,875
2013	160,378	2018	165,177
2014	161,001	2019	166,658
2015	161,785	2020	168,322

Source: 2010 Census of Guam as reported by the Bureau of Statistics and Plans, Guam Statistical Yearbook 2017
NOTE: Uses 2000 and 2010 population growth rate

Males slightly outnumber females, comprising 51% of the total population. Nearly 40% of the population is under the age of 21 years (Table 6 and Figure 4).

Guam's population is multi-ethnic/multi-racial. Chamorus remain the largest ethnic group, making up 37% of the island's population, and representing a 3.6% increase since 2000. Filipinos are the second largest group, comprising 26% of the total. The Yapese and Chuukese had the fastest rate of growth---the Yapese population grew by 84.1%, from 686 in 2000 to 1,263 in 2010, while the number of Chuukese grew by 80.3%, from 6,229 in 2000 to 11,230 in 2010. Majority of Guam residents identify themselves as being of one ethnic origin or race, representing an increase of 8.4% since 2000. Just 14,929 acknowledge 2 or more ethnic or racial origins, a decrease of 30.7% since 2000 (Table 7).

Table 6. Demographic composition of Guam population, sex by age, 2010

Age category	TOTAL	MALE	FEMALE
	159,358	81,568	77,790
Under 5 years	14,289	7,345	6,944
5 to 9 years	13,984	7,200	6,784
10 to 14 years	15,046	7,777	7,269
15 to 19 years	14,407	7,473	6,934
20 to 24 years	12,379	6,678	5,701
25 to 29 years	10,746	5,431	5,315
30 to 34 years	10,346	5,151	5,195
35 to 39 years	11,404	5,753	5,651
40 to 44 years	11,659	6,161	5,498
45 to 49 years	11,072	5,821	5,251
50 to 54 years	9,203	4,758	4,445
55 to 59 years	7,715	3,828	3,887
60 to 64 years	6,361	3,181	3,180
65 to 69 years	3,889	1,934	1,955
70 to 74 years	3,030	1,411	1,619
75 to 79 years	1,984	838	1,146
80 to 84 years	1,151	525	626

Source: 2010 Census for Guam as reported by the Bureau of Statistics and Plans, Guam Statistical Yearbook 2017

Table 7. Ethnic composition of Guam population, 2010 and 2000

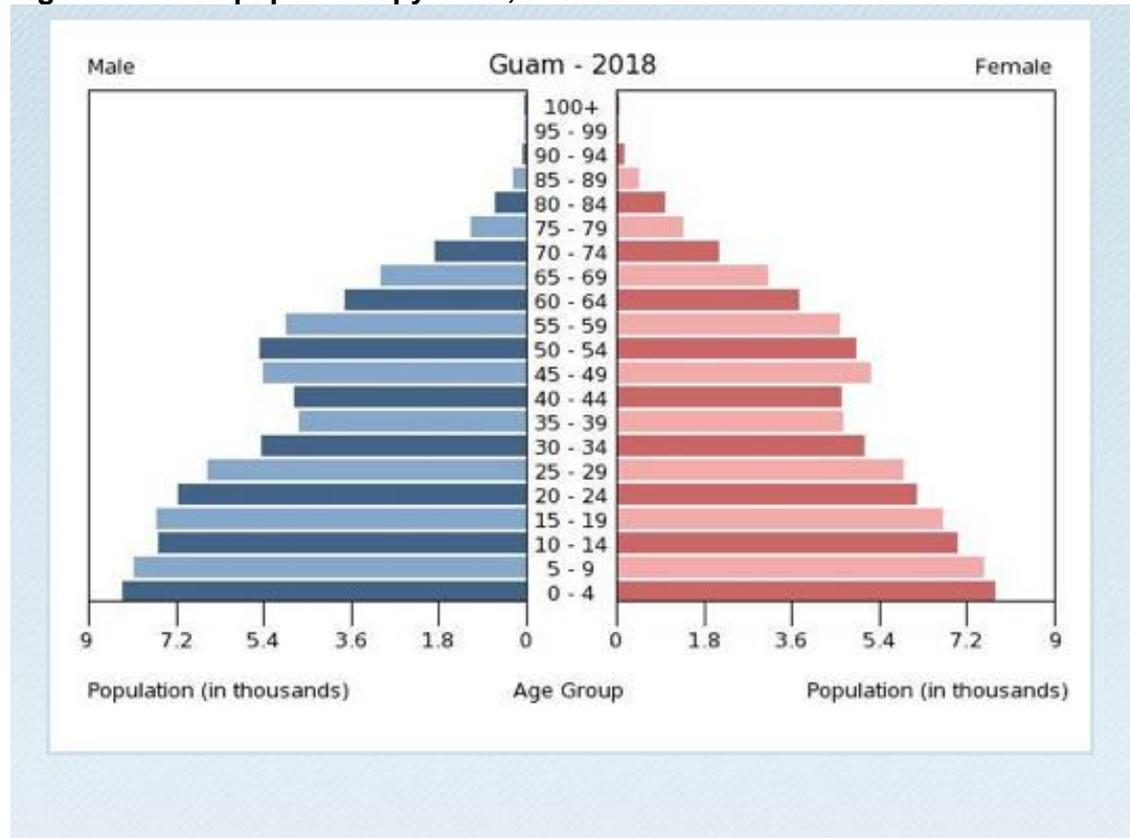
ETHNICITY	2010	2000*
One Ethnic Origin or Race:	144,429	133,252
Native Hawaiian and Other Pacific Islander:	78,582	69,039
Carolinian	242	123
CHamoru	59,381	57,297
Chuukese	11,230	6,229
Kosraean	425	292
Marshallese	315	257
Palauan	2,563	2,141
Pohnpeian	2,248	1,366
Yapese	1,263	686
Other Native Hawaiian and Other Pacific Islander	915	648
Asian:	51,381	50,329
Chinese (except Taiwanese)	2,368	2,707
Filipino	41,944	40,729
Japanese	2,368	2,086
Korean	3,437	3,816
Taiwanese	249	991
Vietnamese	337	10,509
Other Asian	678	1,568
Black or African American	1,540	1,807
Hispanic or Latino	1,201	69,039
White	11,321	123
Other Ethnic Origin or Race	404	57,297
Two or More Ethnic Origins or Races	14,929	21,553
Native Hawaiian and Other Pacific Islander and other groups	11,656	
CHamoru and other groups	9,717	7,946
Asian and other groups	8,574	10,853
Total:	159,358	154,805

Source: US Census Bureau, 2010 Census for Guam, Bureau of Statistics and Plans, Guam Statistical Yearbook 2017;

*US Census Bureau, 2000 Census for Guam, Bureau of Statistics and Plans, 2005 Guam Statistical Yearbook

Note: The Yearbook still uses the old spelling "CHamoru"

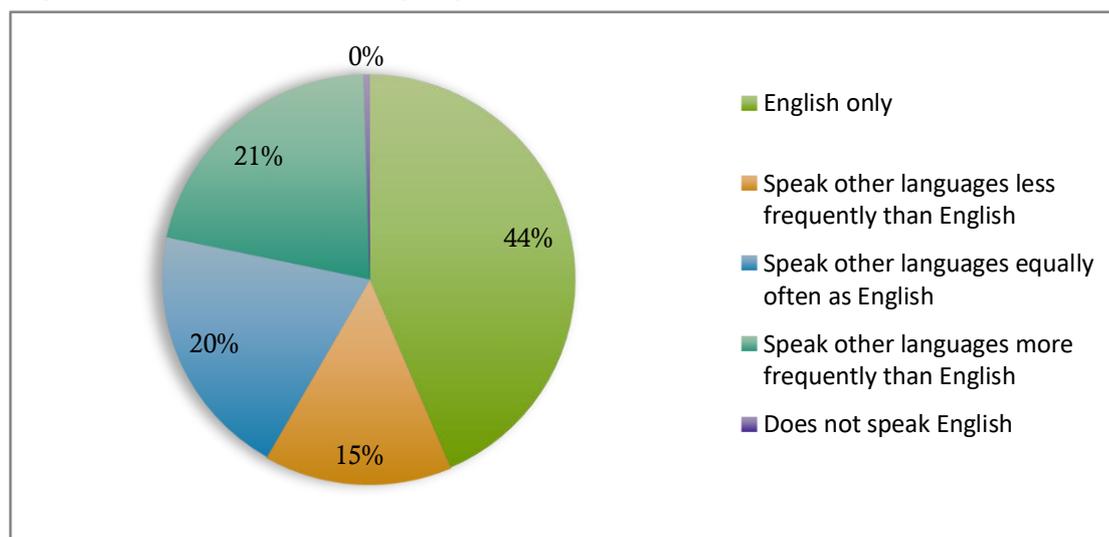
Figure 4. Guam population pyramid, 2018



Source: Central Intelligence Agency, The World Factbook, available at <https://www.cia.gov/library/publications/the-world-factbook/geos/gq.html>; last accessed 28 January 2020

The ethnic diversity is reflected in the languages spoken at home. Twenty percent of the population (over 5 years) speaks a language as frequently as English at home, another 21% speak a language more frequently than English, and 0.5% speaks no English at all. This has a significant implication for effective service delivery, highlighting the need for culturally competent communications and services for close to half of the island’s population (Figure 5).

Figure 5. Population by language spoken at home, Guam, 2010



Source: 2010 Census for Guam as reported by the Bureau of Statistics and Plans, 2016
 Note: These data were not reported in the 2017 Statistical Yearbook.

Impact of the military on population demographics

The US Military continues to play a significant role in Guam, and although substantial delays have impeded the Marine Corps relocation from Okinawa, Japan to Guam, preparatory work for the planned military build-up continues. As of 2017, military and family members comprised 7.1% of Guam's total population, down from 7.9% in the previous year (Table 8).

Table 8. Military active duty and family members on Guam, 2013 - 2017

Military and Family Members	2017	2016	2015	2014	2013
Active duty	5,685	5,572	6,115	6,006	5,819
Family members	5,874	7,235	7,211	6,648	7,252
Total Military and dependents	11,559	12,807	13,326	12,654	13,071
Resident population of Guam	163,875	162,472	161,785	161,001	160,378
% Military and dependents	7.1%	7.9%	8.2%	7.9%	8.2%

Source: COMNAVMAR, as reported by Bureau of Statistics and Plans, Guam Statistical Yearbook 2017

Data on school enrollment in the various categories of schools, including the Department of Defense (DoDEA) schools is available up to school year 2017-2018 (Table 9). Students enrolled in military schools made up 6% of total enrollment for school year 2017-2018, while students in Catholic and other private schools comprised 19%. These students are excluded from the Guam Youth Risk Behavior Surveillance (GYTS) System, which is the primary data source for tobacco, alcohol and drug use and other risky behavior among Guam youth.

Table 9. Fall term enrollment in Guam schools, Guam SY 2012-2013 to SY 2017-2018

School	2017-2018	2016-2017	2015-2016	2014-2015	2013-2014	2012-2013
Total School Enrollment	39,386	39,696	39,523	39,836	39,771	40,359
Private schools	7,624	7,188	7,048	7,077	6,581	6,948
DoDEA	2,252	2,264	2,168	2,139	2,235	2,238
Guam public school system	29,510	30,244	30,307	30,620	30,955	31,173

Source: Catholic Education Office; Department of Defense Education Activity (DoDEA); other Private Schools and Guam Department of Education, Government of Guam, as reported by the Bureau of Statistics and Plans, Guam Statistical Yearbook 2017

The Youth Risk Behavior Survey (YRBS), which is the primary data source for tobacco, alcohol and drug use and other risky behavior among Guam youth, covers 3 out of 4 students in Guam. The Guam Global Youth Tobacco Survey (GYTS) provides additional data for tobacco-related questions.



Prevention system context

The GBHWC is Guam's single state agency responsible for mental health promotion and service provision and substance abuse prevention and control. Its mandate is firmly established through Guam Public Law 17-21. GBHWC's Prevention and Training (P&T) Branch, under the umbrella of the Division of Clinical Services, directly oversees the prevention arm of the Department's core functions.

GBHWC provides leadership in obtaining state and federal funding to support comprehensive prevention services on Guam. GBHWC's P&T Branch provides direct community-based prevention services that incorporate CSAP's six primary prevention strategies – (1) information dissemination, (2) problem identification and referral, (3) education, (4) alternatives, (5) community-based process, and (6) environmental strategies. The P&T Branch monitors GBHWC's prevention systems and processes as part of an ongoing quality control assessment of the Department's prevention service delivery. In addition, the P&T Branch maintains the Center's prevention website (www.peaceguam.org), conducts information dissemination and mass media campaigns, manages the various prevention grants of the GBHWC and provides community-based and stakeholder training and technical assistance. Current resources for prevention programs include the Government of Guam "state" legislative appropriations and the SAMHSA Substance Abuse Prevention and Treatment Block Grant funds.

GBHWC works in collaboration with other partner agencies and community-based organizations to develop, implement and assess prevention policies and programs. The P&T Branch is currently supported by the Governor's Prevention Education and Community Empowerment (PEACE) Council - a multi-sectoral, state-level advisory group representative of the three branches of government and key prevention stakeholders from the private sector, including cultural, faith-based and non-governmental/community-based organizations. The Council's composition reflects the ethnic and cultural make-up of the Guam community and provides direction and guidance for prevention priorities and approaches. Guam's State Epidemiological Outcomes Workgroup (SEOW) serves as a technical working group that supports GBHWC with local data on substance abuse consumption and consequences, suicide epidemiology, and selected mental health indicators.

The P&T Branch employs a community-based participatory approach to strategic planning. The first PEACE Strategic Prevention Framework-State Incentive Grant (SPF/SIG), Guam Comprehensive Strategic Plan (2006-2009) focused on prevention of tobacco use and harmful alcohol use, reduction in underage drinking and substance abuse-related problems and enhancement of community capacity and infrastructure for prevention. The current State Prevention Enhancement (SPE) Plan 2014-2018 expands prevention goals to include:

- Preventing/reducing consequences of underage drinking and adult problem drinking;
- Preventing suicides and attempted suicides among populations at risk, including military families and LGBTQ youth;
- Reducing prescription drug misuse and abuse;
- Preventing substance abuse and mental illness (promote positive mental health);
- Enhancing policy and augmenting funding to support needed services for behavioral health system improvements on Guam; and
- Strengthening behavioral health workforce development initiatives.

DATA SOURCES AND METHODS

In 2005, Guam's SEOW members began by identifying a set of indicators specific to Guam that delineated alcohol, tobacco and other drug consumption patterns and the consequences related to the use of these substances. The criteria for selection of indicators included the following:

- Relevance
- Availability of data
- Validity of data
- Frequency/regularity of data collection
- Consistency in measurement
- If possible, existence of data disaggregated geographically, by age, sex and/or ethnicity/race

The SEOW also compiled a list of existing datasets from which to extract the data for the selected indicators. Indicators from well-established population-based surveillance systems---such as the Behavioral Risk Factor Surveillance System (BRFSS) and the Youth Risk Behavior Surveillance System (YRBS)---were given the greatest weight.

There are serious data gaps for Guam, and through the years, the SEOW has worked to address these gaps.

- **Adult illicit drug use*:** Guam had no data on adult illicit drug use from a population-based survey prior to the SEOW. As a stopgap measure, in 2007 and 2008, GBHWC (formerly DMHSA) commissioned a population-based phone survey of drug use among youth and adults, but this could not be sustained because of the expense. In 2009, the SEOW facilitated a Memorandum of Understanding (MOU) between GBHWC and DPHSS to incorporate selected questions on illicit drug use in the BRFSS as State-added questions (SAQs). This ongoing MOU (renewed annually since 2010) now provides population-based adult data on illicit drug consumption.
- **Betel/areca nut use with tobacco*:** In 2017 and 2018, adult data on betel/areca nut use, with and without tobacco, was collected from State-added questions in the BRFSS.
- **Guam ethnicity categories*:** Earlier adult tobacco and alcohol data from the BRFSS could not be disaggregated using Guam-specific ethnic categories. The SEOW requested DPHSS to add island-specific ethnic categories as a State-added question in 2008.
- **Expanded youth data:**
 - **Out of school youth** - To expand the coverage of youth data, the SEOW also facilitated an agreement between GBHWC and the Department of Youth Affairs (DYA) and Sanctuary, Inc. (a private sector provider of youth drug rehabilitation services) to administer a subset of YRBS questions to all of their clients, representing court-involved youth outside of the school system. Through this agreement, data on drug consumption is now available for out-of-school high-risk youth. However, no new data for this group were available for the current edition of the Epi Profile.
 - **Private school students** - The P&T Branch and SEOW are negotiating similar agreements with the private schools to administer the YRBS to their students.
 - **Additional tobacco-related youth data** - Data on smoking and smokeless tobacco use, cessation, secondhand smoke exposure, pro- and anti-tobacco media and advertising, access to and availability of

tobacco products and knowledge and attitudes regarding tobacco use are collected through the Guam Global Youth Tobacco Survey (GYTS), which, to date, has been conducted in 2011, 2014 and 2017. The 2017 results are included in this profile.

- **Suicide-related data** - The SEOW undertook a working agreement with the Office of Guam’s Chief Medical Examiner to obtain suicide mortality data and with the Guam Memorial Hospital to access suicide-related hospital and Emergency Room admissions data.
- **Mental health indicators** – The SEOW has gradually expanded the scope of its data analysis and now includes information on depression, violence, sexual violence and bullying among youth, and depression among adults (as an optional module to core BRFSS questions)*. It also includes some questions on risk and protective factors for tobacco, alcohol and substance abuse, as SAQs to the YRBS and BRFSS.
- **LGBTQ population** – In 2015, the SEOW incorporated data from the Guam’s Alternative Lifestyle Association (GALA), a PEACE Partnerships for Success Partner, into the Profile. However, no new data is available from this population subgroup for the current edition of the Profile.

***Note: Data obtained through SAQs for 2017 and 2018 could not be included in this profile, because the fire that destroyed the central DPHSS office put the DPHSS servers, where the databases are stored, out of service. Thus, for this version of the profile, only data from the core BRFSS questions are available for reporting.**

It is anticipated that over time more behavioral health indicators will be incorporated into the Epi Profile. Currently, selected indicators for the expanded Epi Profile include:

Table 10. SEOW selected indicators

ALCOHOL Indicators	Consumption	Consequences
	Lifetime use of alcohol by Middle School students	Chronic liver disease death rate
	Current use of alcohol by High School students	Suicide death rate
	Current use of alcohol by 18 and older	Homicide deaths
	Current binge drinking by High School students	% Fatal motor vehicle crashes that are alcohol-related
	Current binge drinking by 18 and older	Violent crime rate
	Current heavy use of alcohol by 18 and older	Property crime rate
	Current binge drinking by LGBTQ	Alcohol abuse or dependence
	Current heavy use of alcohol by LGBTQ	Alcohol-related confinement
	Early initiation of alcohol use	% Alcohol-related participation in treatment programs
	Drinking and driving among High School students	
	Consumption patterns among court-involved youth	
	Use of alcohol on school property by High School students	
TOBACCO Indicators	Consumption	Consequences
	Current smoking by Middle School students	Deaths from lung cancer

<p>Current smoking by High School students</p> <p>Current smoking by 18 and older</p> <p>Current smoking by LGBTQ</p> <p>Current smokeless tobacco use by Middle School students</p> <p>Current smokeless tobacco use by High School students</p> <p>Current smokeless tobacco use by adults</p> <p>Lifetime daily cigarette use by Middle School students</p> <p>Current daily cigarette use by High School students</p> <p>Current daily cigarette use, 18 and older</p> <p>Early initiation of tobacco use</p> <p>% vendors selling to minors</p> <p>Quit attempts in the past year</p> <p>Use of cigarettes and smokeless tobacco products on school property</p>	<p>Deaths from chronic obstructive pulmonary disease (COPD) and emphysema</p> <p>Deaths from cardiovascular and cerebrovascular diseases</p> <p>Tobacco-related cancer prevalence</p>
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DRUGS	Consumption	Consequences
Indicators	<p>Lifetime use of marijuana by Middle School students</p> <p>Lifetime and current use of marijuana by High School students</p> <p>Early initiation of marijuana use</p> <p>Lifetime and current use of marijuana by adults</p> <p>Lifetime and current use of marijuana by LGBTQ</p> <p>Lifetime use of cocaine by Middle School students</p> <p>Lifetime and current use of cocaine by High School students</p> <p>Lifetime use of inhalants by Middle School students</p> <p>Lifetime use of inhalants by High School students</p> <p>Lifetime use of methamphetamines or “ice” by Middle School students</p> <p>Lifetime and current use of methamphetamines or “ice” by adults</p> <p>Lifetime and current use of other drugs by adults</p> <p>Lifetime and current use of other drugs by LGBTQ</p> <p>Lifetime use of steroids or other prescription drugs by High School students</p> <p>Illegal drug use on school property</p> <p>Other drug use patterns among court-involved youth</p> <p>% US Probation Office drug testing positive for any drug</p> <p>Drug seizures per year by type and amount of drug</p>	<p>Property crime rate</p> <p>Violent crime rate</p> <p>Drug abuse or dependence</p> <p>Drug-related arrests</p>

SUICIDE	Vital Statistics	Related Data
Indicators	Suicide mortality rate Demographic characteristics of suicide deaths % of suicide deaths involving alcohol use % of suicide deaths involving other drug use	Suicidal ideation among school youth Suicidal ideation among LGBTQ Suicidal attempts among school youth Suicidal attempts among LGBTQ % of school youth reporting persistent sadness % of school youth identifying themselves as bi- or homosexual

MENTAL HEALTH	Prevalence
Indicators	Prevalence of depressive symptoms among High School students Prevalence of depressive symptoms among adults % students threatened or injured by a weapon in school in the past 12 months % students in a physical fight in the past 12 months % students forced to have sexual intercourse, lifetime % students subjected to partner violence in the past 12 months % students bullied on school property in the past 12 months % students electronically bullied in the past 12 months % LGBTQ bullied for their sexual preference, lifetime

At present, Guam’s SEOW tracks data on substance abuse consumption and consequences and suicide from the following data sources:

Table 11. Data sources

Data Source	Frequency	Agency	Data Type
Behavioral Risk Factor Surveillance System (BRFSS)	annual	DPHSS	Adult tobacco and alcohol use, illicit drug use, depression
Youth Risk Behavior Surveillance System (YRBS)	biannual	Guam Dept. of Education (GDOE)	Youth tobacco, alcohol and drug use; suicidal ideation and attempts; bullying, sexual violence, violence
Modified YRBS	annual	DYA	Youth tobacco, alcohol and illicit drug use
Guam Youth Tobacco Survey (GYTS)	Every 3 years	DPHSS & WHO	Youth tobacco use, cessation, secondhand smoke exposure, pro- and anti-tobacco media and advertising, access to and availability of tobacco

			products and knowledge and attitudes regarding tobacco use
Synar annual tobacco vendors' compliance survey	annual	GBHWC	Vendor compliance to prohibition of tobacco sales to minors
Vital Statistics	annual	DPHSS	Leading Causes of Mortality
Guam Cancer Facts and Figure, Cancer Registry	2008-2012	DPHSS	Cancer prevalence and mortality
Guam Uniform Crime Report	annual	Guam Police Department	Alcohol and drug-related crime
US Probation Office Client Random Drug Testing Statistics	annual	Guam US Probation Office	Adult drug offenders random drug testing results
Suicide Mortality Report	quarterly	Chief Medical Examiner's Office	Suicide deaths and associated data
GALA, Inc. Assessment Report	2014	GALA, Inc.	Tobacco, alcohol and drug use among LGBTQ; suicidal ideation and attempts; physical violence

Organization and structure of the 2018 Guam Epi Profile

The Profile follows the format of previous Profiles and is divided into an introductory section with background information on the island, a section on data sources and methods, and separate sections on alcohol, tobacco, illicit drugs, suicide and mental health indicators is included. Each section provides trends, comparisons with the US national average, and when data are available, rates among population sub-groups. Data highlights are summarized in problem statements that appear at the beginning of each chapter. A text description of the essential findings for every indicator is supplemented with tables and charts.

In general, summary statistics for Guam are compared with nationwide averages. Whenever possible, data is disaggregated by sex, age group, income, education and ethnicity/racial group. As much as possible, ethnicity categories are reflective of the various ethnic groups that make up the Guam population. For several indicators, the numbers of observations are small (e.g. suicide deaths, numbers of specific ethnic groups) and caution is required when interpreting changes across time or across groups; in these cases, a footnote alerting the reader is provided.

One question that is frequently asked is: “How can Guam’s statistics be compared to the mainland when Guam’s population is so much smaller than that of the United States?” For this reason, the statistics describing tobacco, alcohol and illicit drug consumption are in percentages, and data on suicide are in rates per 100,000 to allow comparisons across populations. That is, the consumption of these substances is reported as a fixed proportion of the total population. Thus, even if the absolute numbers of individuals reporting the use of these substances are much smaller than the US numbers, the magnitude of the problem in relation to the total population can be compared.

Because the projected audience of this report is a diverse one, we have purposely attempted to keep the language as simple as possible, and to avoid highly technical terms. When technical language is used, the definitions are provided as notes within the text.

Data Issues and Limitations

Youth Data

Data on youth smoking is largely provided through the Guam Department of Education (GDOE) Youth Risk Behavior Survey (YRBS), for which biennial information is available for the years 1995-2007, and 2011-2017.

Data from the YRBS for the years 1999, 2001, 2003 and 2005 were not reported in national databases because the data were not weighted. The withdrawal of several private schools from the survey, after sampling was already carried out, resulted in low overall response rates for 1999-2003. In 2005, a number of sites failed to comply with the sampling methodology. This profile uses the unweighted data from those years. Therefore, care must be taken when comparing the results from 1999 – 2005 with US national medians. In 2009, a shift in school policy regarding the procedure for parental consent resulted in a significantly lower turnout in respondents, leading the GDOE to invalidate the survey. Hence, no data are available for 2009.

An additional challenge is the change in coding categories for ethnicity/race over the different survey years. For this profile, categories were collapsed to Filipino, Other Asian, CHamoru*, Micronesian Islanders, White and Others. However, only CHamoru,

Filipino and Micronesian Islanders were retained consistently throughout the various survey years.

(*Note: “CHamoru” was replaced with “CHamoru” in accordance with Guam Public Law 33-236 in 2018.)

Adult Data

With regards to adult data, the US Centers for Disease Control and Prevention (CDC), which administers the BRFSS, introduced a new weighting methodology, replacing the “poststratification” method with “raking” or iterative proportional fitting in 2011. This more sophisticated method for weighting survey data makes adjustments for each variable individually in a series of data processing-intensive iterations. As each variable in the weighting process is included, the weights are adjusted until the sample weights are representative of the population (CDC 2012).

These changes resulted in an upward shift of prevalence trends for certain risk factors, such as smoking. To avoid misinterpretation of trend line shifts artificially resulting from improved methods of measuring risk factors, CDC recommends caution in interpreting 2011 prevalence data. The Guam SEOW concurs with this recommendation, and no longer uses pre-2011 BRFSS data for trend analysis. Instead, 2011 BRFSS data now serves as the baseline for forward trend analysis. Thus, trends for adult data begin with 2011 data.

Small numbers

Some of the data categories, especially for ethnicity, have small numbers ($n < 50$). Hence, caution is needed when interpreting year-to-year variations, and cross-category differences.

SUBSTANCE ABUSE

TOBACCO

Consumption: Adults

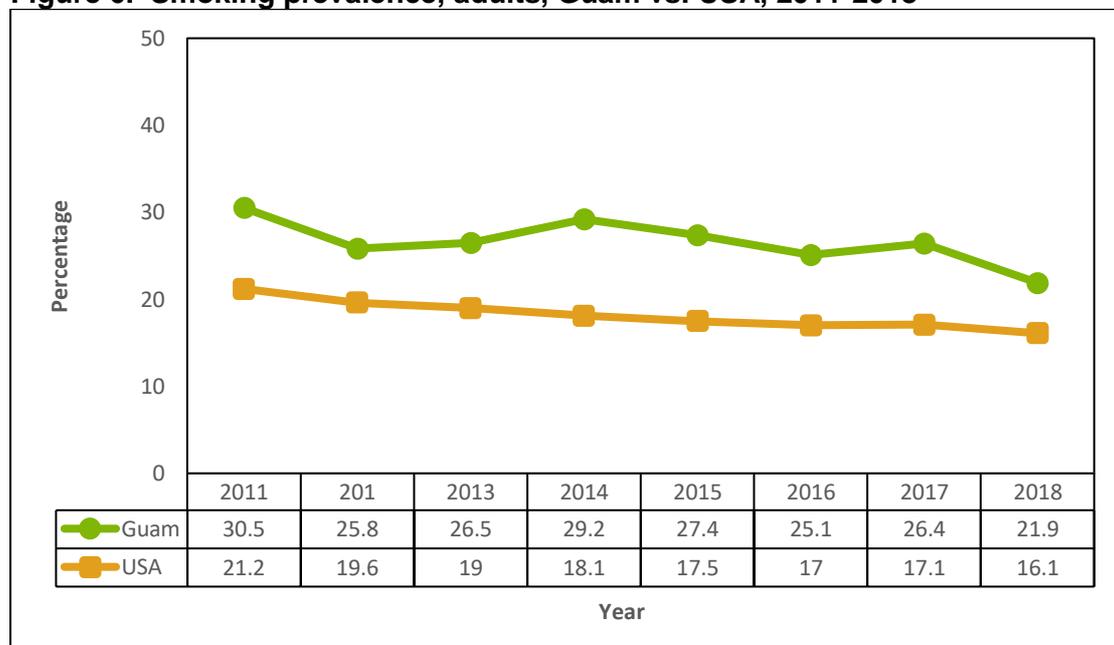
Smoking

MAGNITUDE AND TREND

The BRFSS defines current smokers as adults who have smoked at least 100 cigarettes in their entire life and who currently smoke, either everyday or some days.

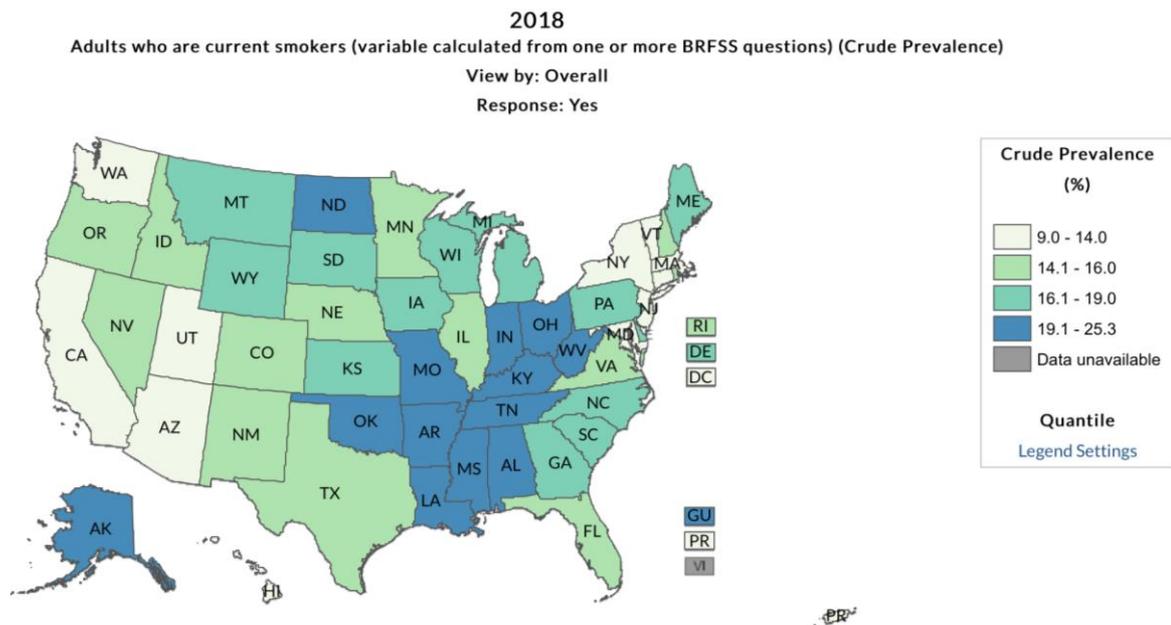
Adult smoking in Guam has decreased gradually since 2011. However, for all years where data are available, the prevalence in Guam is higher than the median smoking prevalence of all US States and Territories (Figure 6). Its prevalence rate is among the highest in the country (Figure 7).

Figure 6. Smoking prevalence, adults, Guam vs. USA, 2011-2018



Source: Guam DPHSS, BRFSS, 2011-2018; CDC, BRFSS 2011-2018

Figure 7. Smoking prevalence, adults, Guam vs. USA, 2018



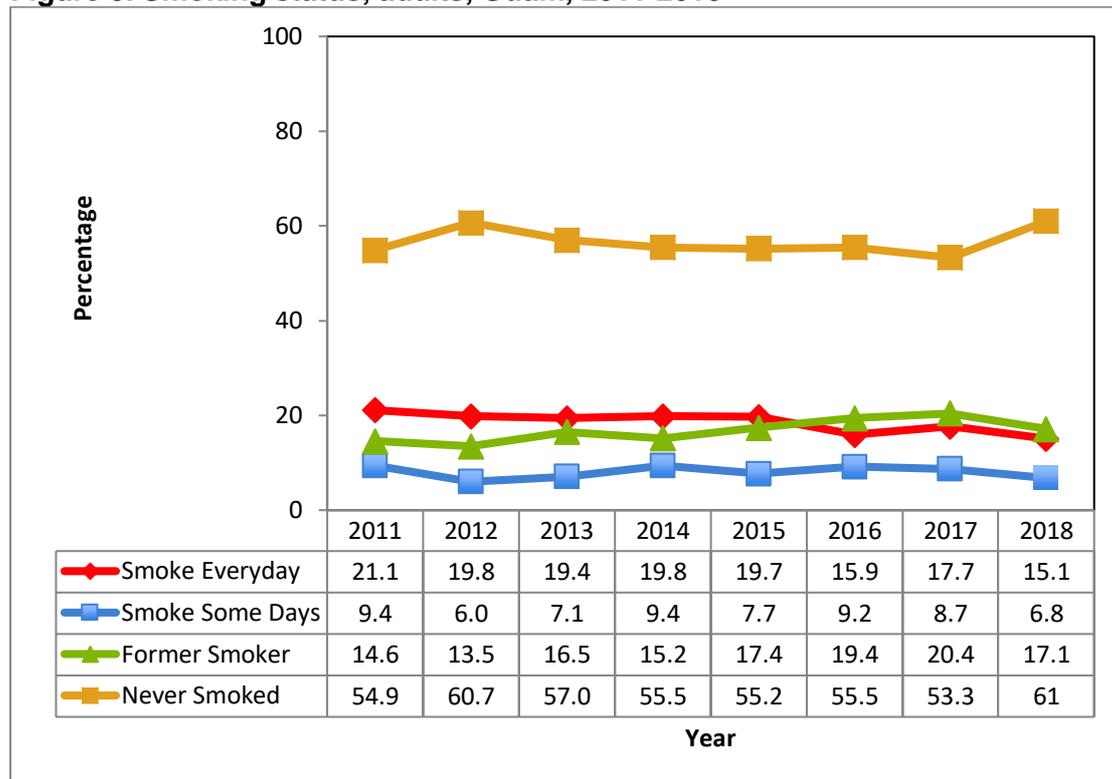
Source: CDC, BRFSS 2018

PREVALENCE

Tobacco consumption remains prevalent in Guam. At present, about 1 in 5 adults smoke in Guam.

Daily smoking is associated with nicotine addiction. In Guam, daily smoking decreased from 2017, and the percentage of never smokers increased from previous years. Currently, 17% of adults in Guam are former smokers; 15% smoke every day, 7% smoke some days, and 61% have never smoked (Figure 8). Among those aged 18-24 years, 85% have never smoked.

Figure 8. Smoking status, adults, Guam, 2011-2018



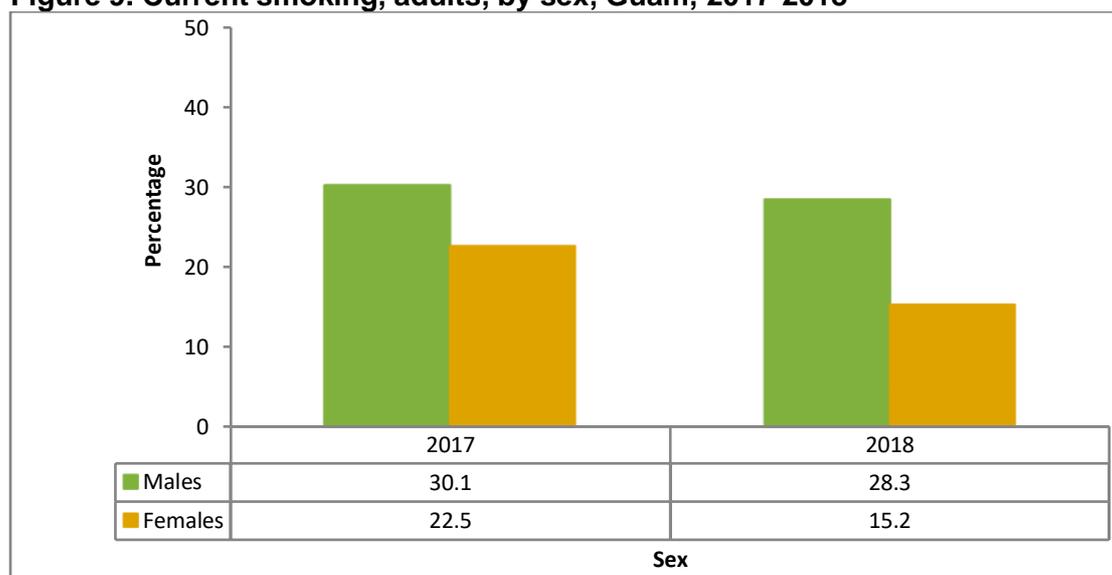
Source: Guam DPHSS, BRFSS, 2011-2018; CDC, BRFSS 2011-2018

CORRELATES OF ADULT SMOKING

Sex

Men smoke more than women in Guam (28% vs. 15%). Female smoking in Guam decreased more rapidly than male smoking from 2017 to 2018 (Figure 9). In 2018, female smoking in Guam was similar to male smoking in the USA (15.2% vs. 15.6%)

Figure 9. Current smoking, adults, by sex, Guam, 2017-2018

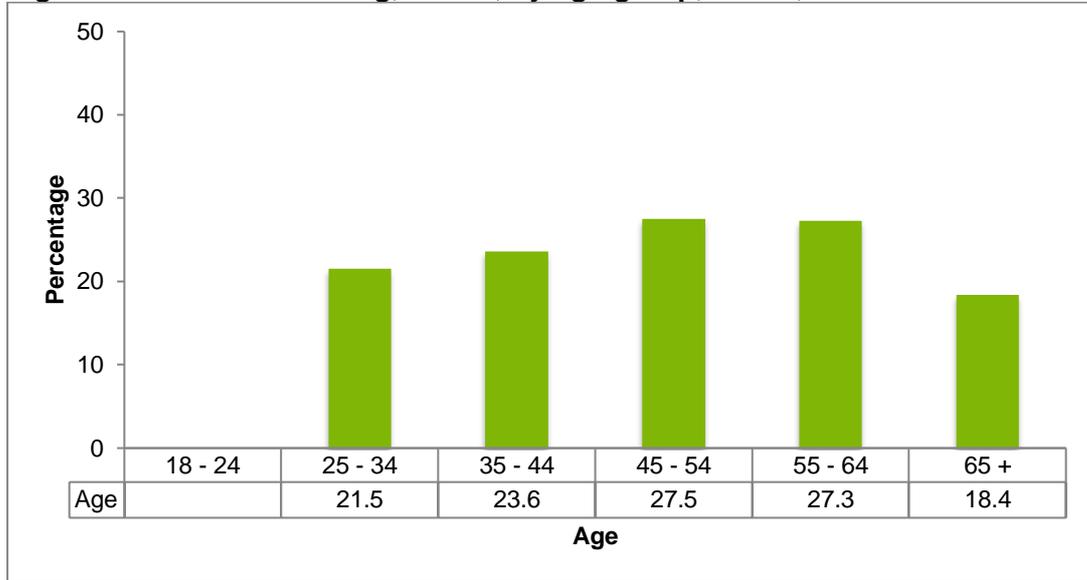


Source: Guam DPHSS, BRFSS, 2018; USA data from Centers for Disease Control and Prevention. Current cigarette smoking among adults in the United States, www.cdc.gov/tobacco/data_statistics/fact_sheets/adult_data/cig_smokinbg/index.htm (last accessed 31 January 2020).

Age

Adults aged 45 to 64 have the highest smoking prevalence. In contrast, there were not enough respondents to accurately calculate a smoking prevalence for those aged 18-24. Smoking rates decline progressively in those aged 45 years and older, partly reflecting the loss of smokers due to tobacco-related mortality (Figure 10).

Figure 10. Current smoking, adults, by age group, Guam, 2018



Source: Guam DPHSS, BRFSS, 2018

Income

Smoking prevalence declines with increasing income (Figure 11). Those with lower incomes are more likely to be daily smokers; in contrast, those with higher incomes are more likely to have never smoked or have quit successfully (former smokers) (Figure 12). This finding is consistent across the years for which data is available and reflects the disparity in tobacco consumption due to socio-economic class.

Figure 11. Current smoking, adults, by income, Guam, 2018

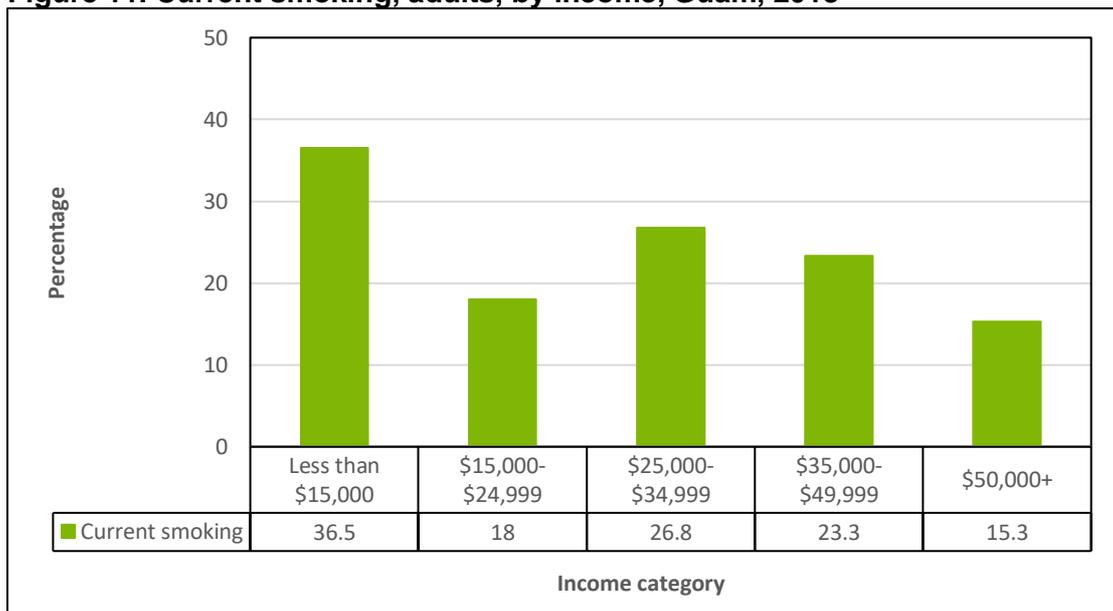
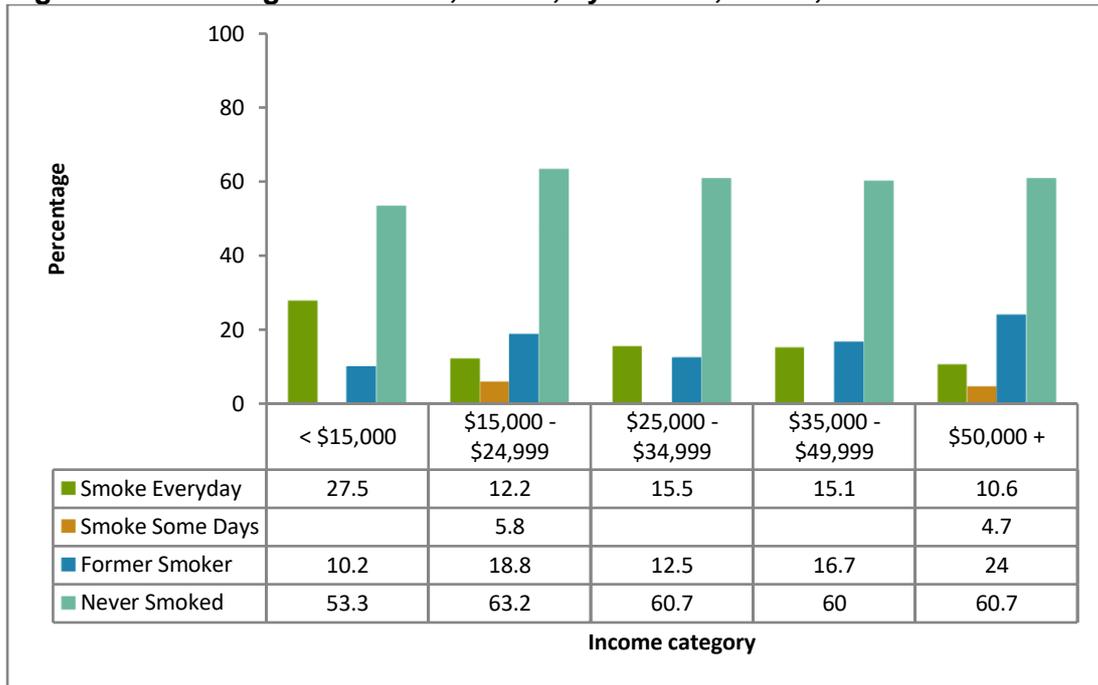


Figure 12. Smoking level status, adults, by income, Guam, 2018

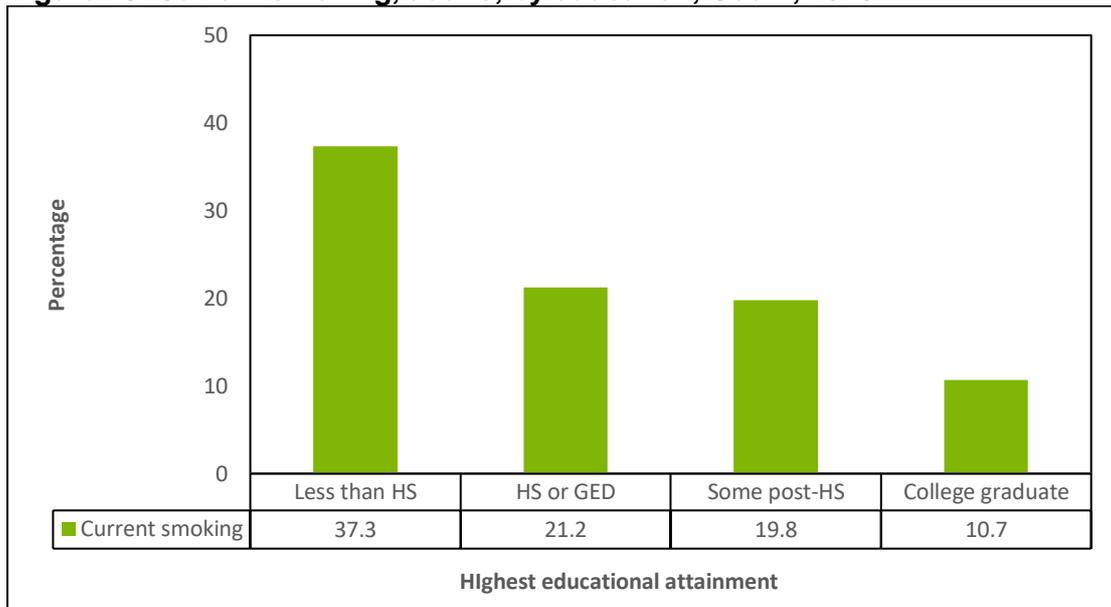


Source: Guam DPHSS, BRFSS, 2018; blank cells = data not available

Education

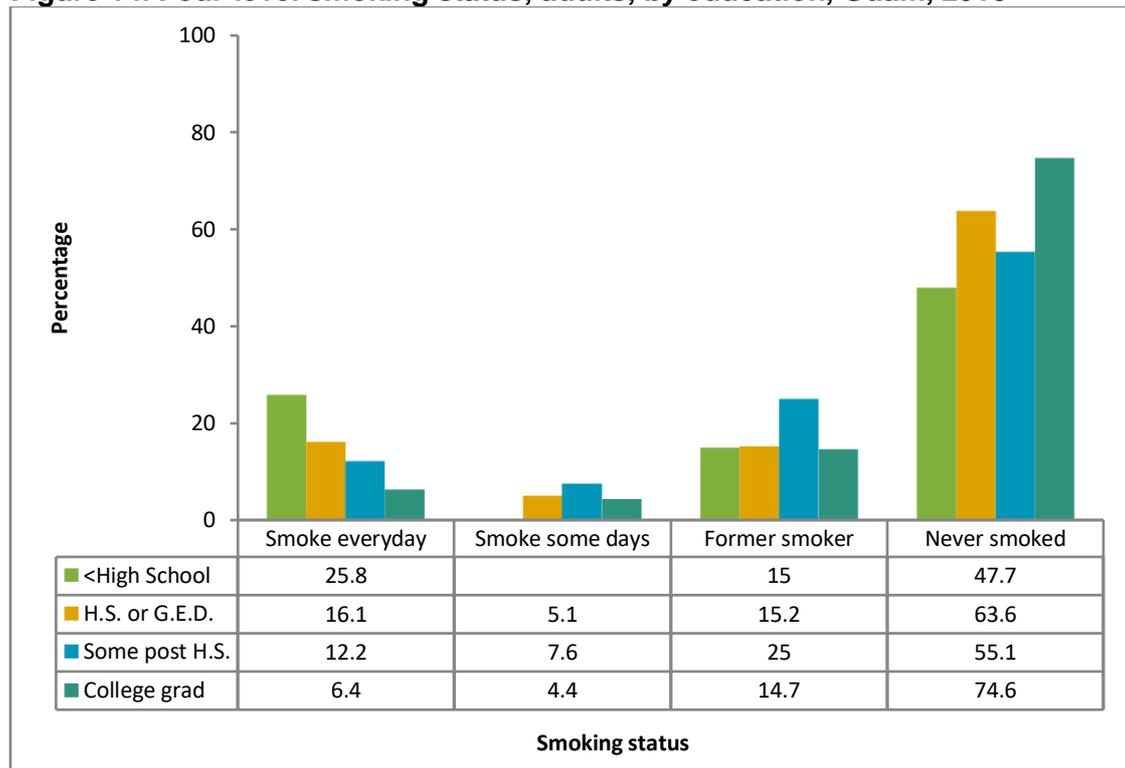
Smoking is inversely related to educational attainment (Figure 13), with current smoking reported more frequently by those with less years of education. This is consistent with global findings that link smoking with socio-economic status and education as social determinants of health. The disparities in smoking and education are reflected in the data on four-level smoking status (Figure 14).

Figure 13. Current smoking, adults, by education, Guam, 2018



Source: Guam DPHSS, BRFSS, 2018

Figure 14. Four-level smoking status, adults, by education, Guam, 2018



Source: Guam DPHSS, BRFSS, 2018; blank cells = data not available

Ethnicity

There is a marked variation in current smoking rates across the various ethnic groups in Guam. CHamorus have the highest rates – 31.3% of CHamoru adults are current smokers – followed by other Asians (21.7%), Whites/Caucasians (12.5%) and Micronesians (12.2%). Filipinos have the lowest rates, with 10.8% of adults reporting current smoking. This difference may explain, in part, the disparity in lung cancer and cardiovascular prevalence and morbidity amongst these groups.

Smokeless Tobacco

TREND and PREVALENCE

Current smokeless tobacco use remained unchanged from 2011, but Guam's prevalence is more than double that of the US median (Figure 15).

Figure 15. Current smokeless tobacco use, adults, Guam vs. USA, 2011-2018



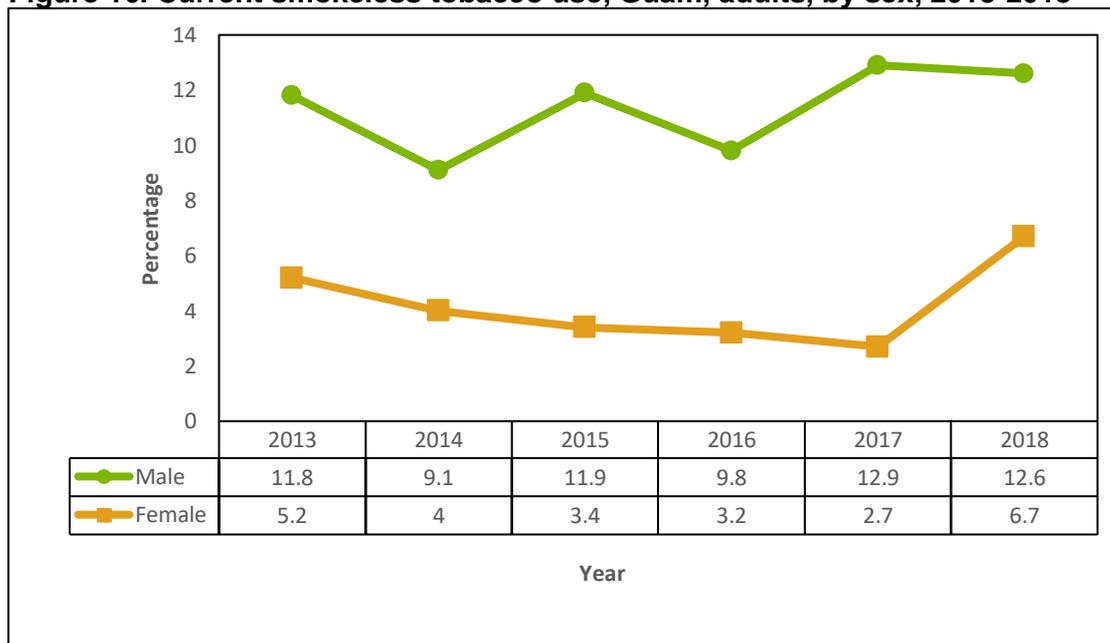
Source: DPHSS and GBHWC, BRFSS State-added question, 2011-2018; CDC, BRFSS, 2013-2018; blank cells = data not available

CORRELATES OF ADULT SMOKELESS TOBACCO USE

Sex

Males were twice as likely as females (Figure 16) to report currently using smokeless tobacco in 2018.

Figure 16. Current smokeless tobacco use, Guam, adults, by sex, 2013-2018

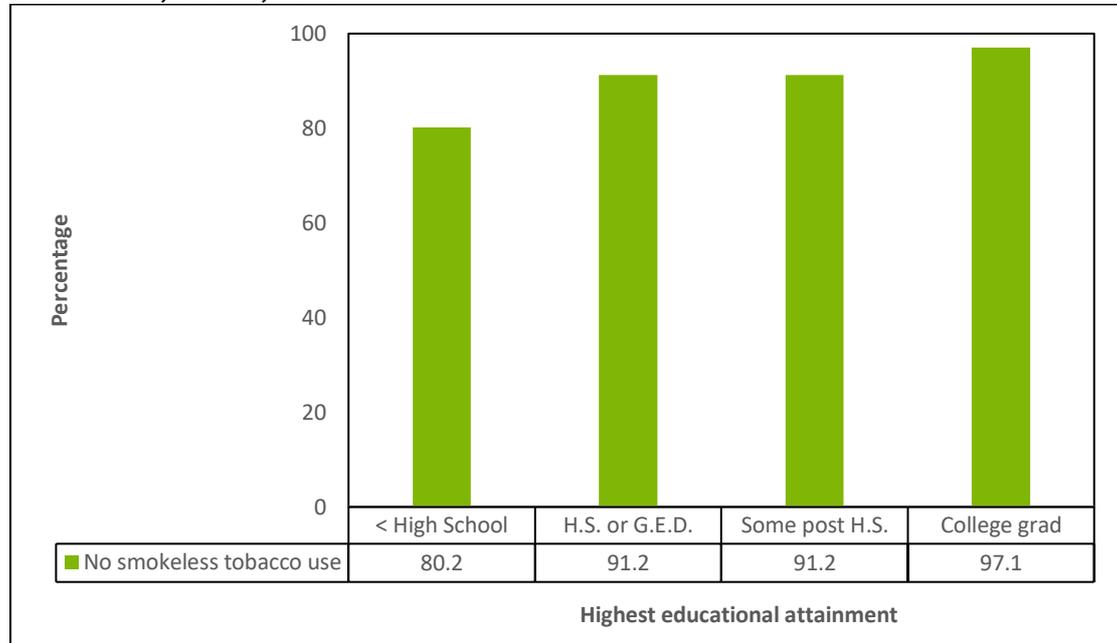


Source: DPHSS, BRFSS, 2013-2018

Education and income

The higher the educational attainment and income, the less likely to report smokeless tobacco use (Figure 17).

Figure 17. Adults reporting no use of smokeless tobacco, by educational attainment, Guam, 2018



Source: DPHSS, BRFSS, 2018

Ethnicity

Smokeless tobacco use was highest among Micronesians (38.6%). The disparity is marked. Whites/Caucasians reported a rate of 8.4%, followed by CHamorus (7.1%), other Asians (3.4%) and Filipinos (3.1%)

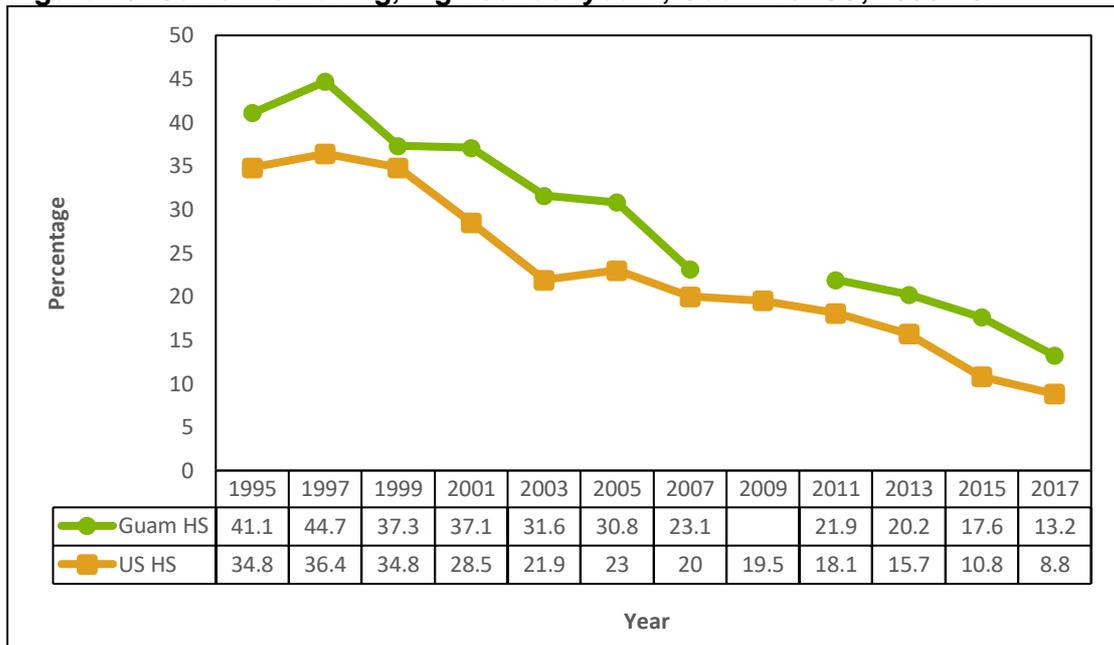
Consumption: Youth

Smoking

TREND

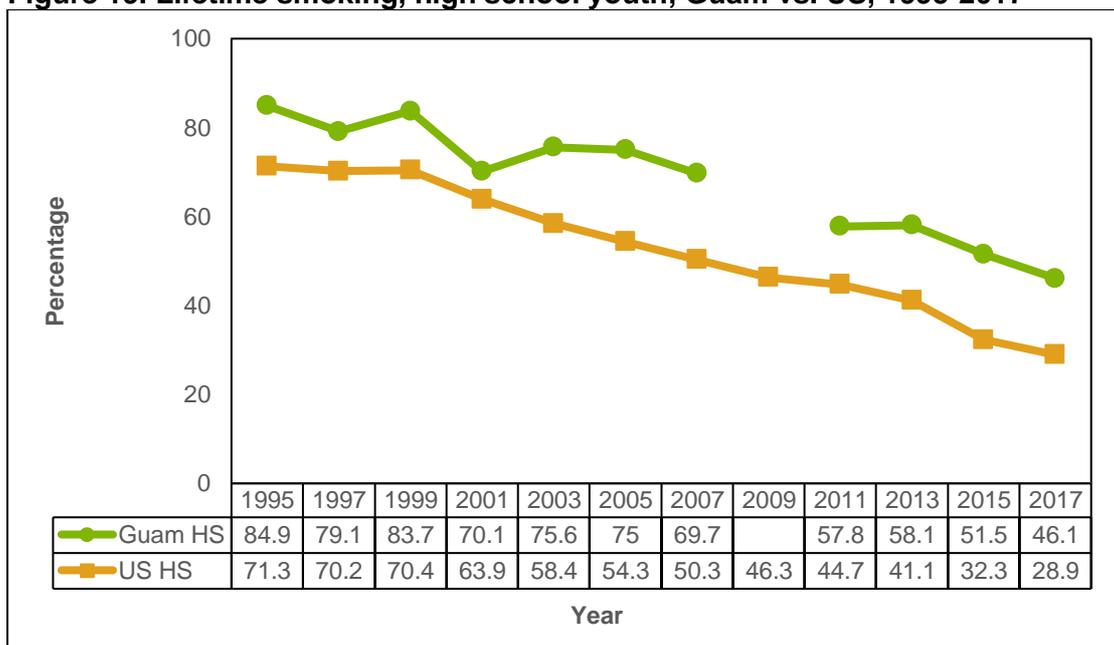
Youth smoking prevalence has been declining in the US mainland and on Guam. Lifetime smoking and current smoking have been decreasing steadily since 1995. However, Guam rates remain higher than the US median (Figures 18-19). The percent of youth who smoked their first cigarette for the first time before the age of 13 years was declining until 2011, but remained unchanged since, and is currently more than twice the US median (Figure 20).

Figure 18. Current smoking, high school youth, Guam vs. US, 1995-2017



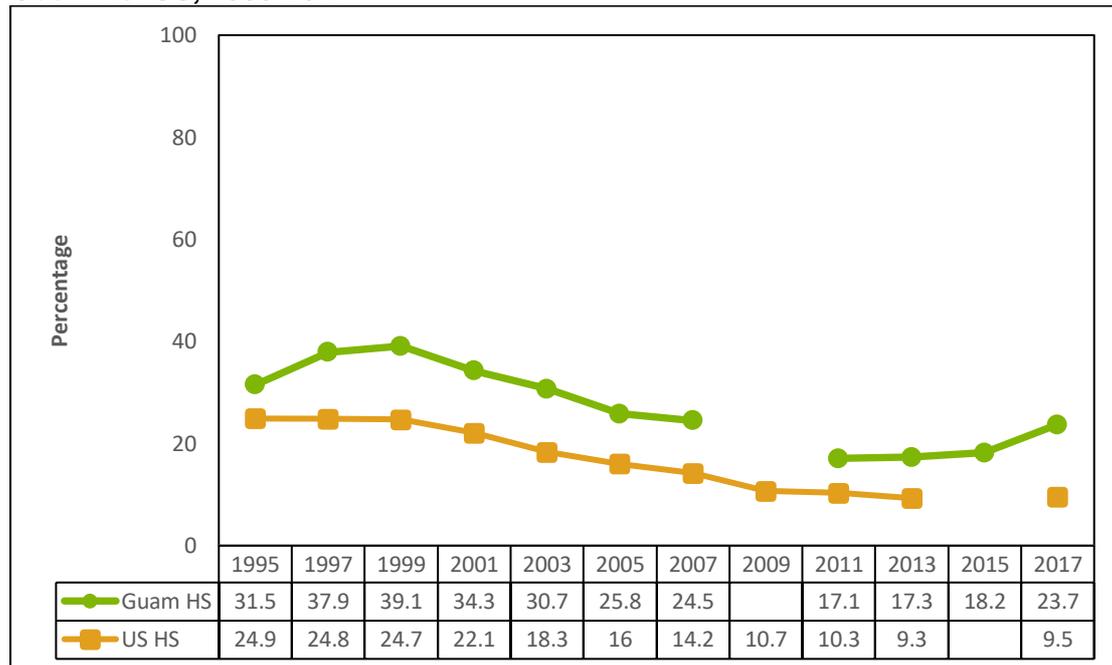
Source: GDOE, YRBS 1995-2017; CDC, YRBS 1995-2017; blank cells = data not available

Figure 19. Lifetime smoking, high school youth, Guam vs. US, 1995-2017



Source: GDOE, YRBS 1995-2015; CDC, YRBS 1995-2017; blank cells = data not available

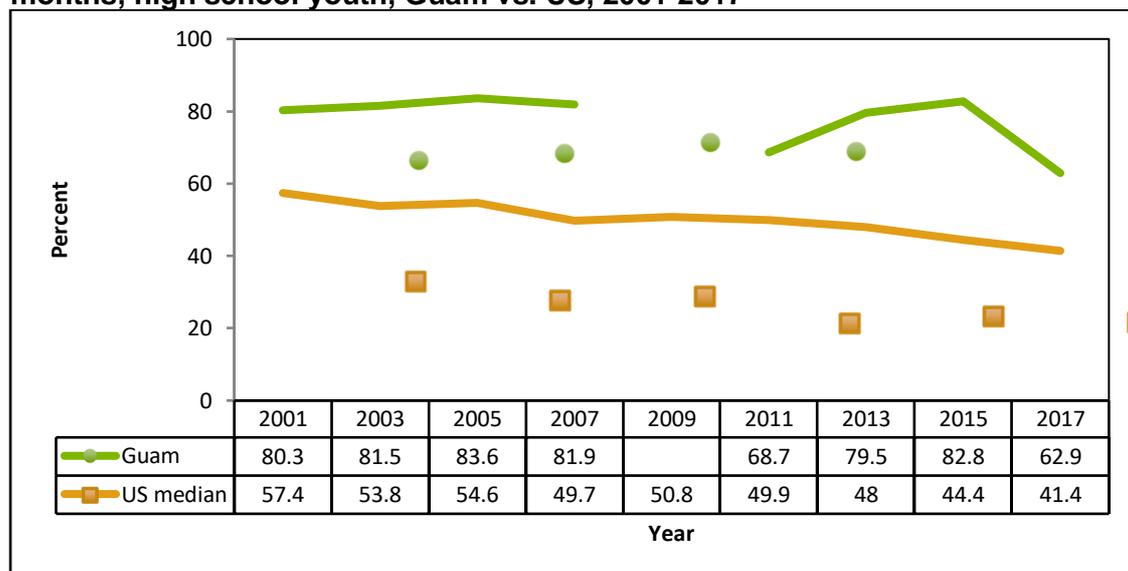
Figure 20. Smoked a whole cigarette before age 13 years, high school youth, Guam vs. US, 1995-2017



Source: GDOE, YRBS 1995-2017; CDC, YRBS 1995-2017; blank cells = data not available

The percentage of youth smokers wanting to quit in the past year has always been higher in Guam than in the US. In 2011, the Guam rate for quit attempts decreased, narrowing the gap, but it rose in 2013 and 2015, before dipping in 2017, while the US rate remained unchanged (Figure 21). Clearly, majority of youth smokers in Guam want to quit, signaling the need to continue providing cessation services for this population. The decline in 2017 highlights the importance of sustained cessation messaging. Preliminary data from formative research on text-based cessation indicate this may be a viable alternative to the currently available telephone and web-based services.

Figure 21. Percentage of current smokers who attempted to quit in the past 12 months, high school youth, Guam vs. US, 2001-2017

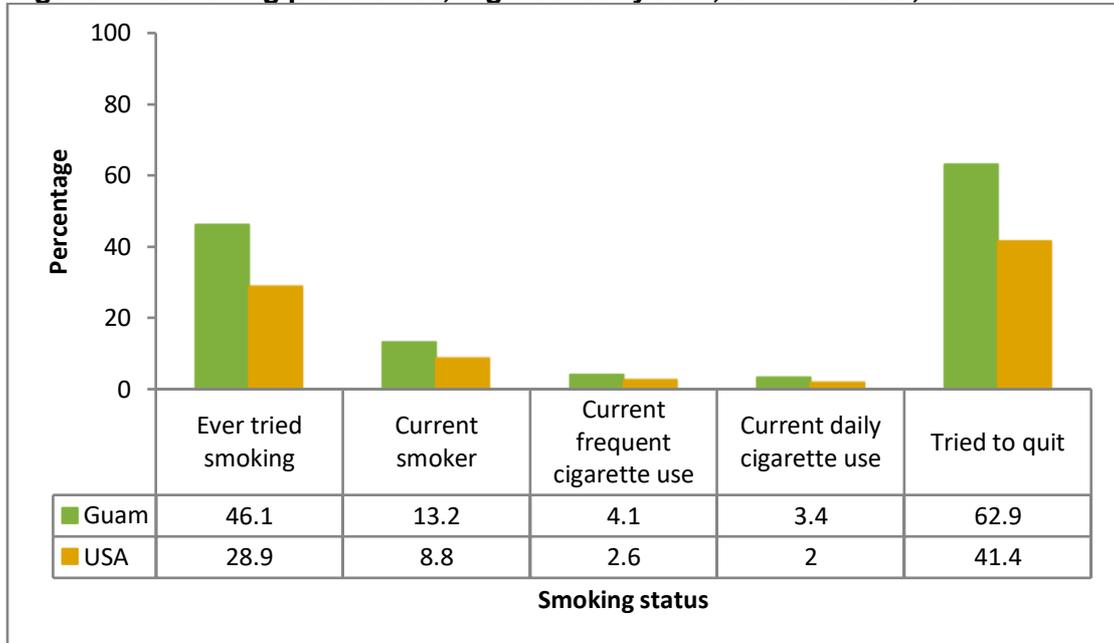


Source: GDOE, YRBS 2001-2017; CDC, YRBS 1995-2017; blank cells = data not available

PREVALENCE

In 2017, nearly half of high school students in Guam had tried smoking. One in seven were current smokers. Six out of ten smokers tried to quit in the past year. Guam youth were more likely than US youth to try smoking, and be current smokers, but they were also more likely to have tried quitting (Figure 22).

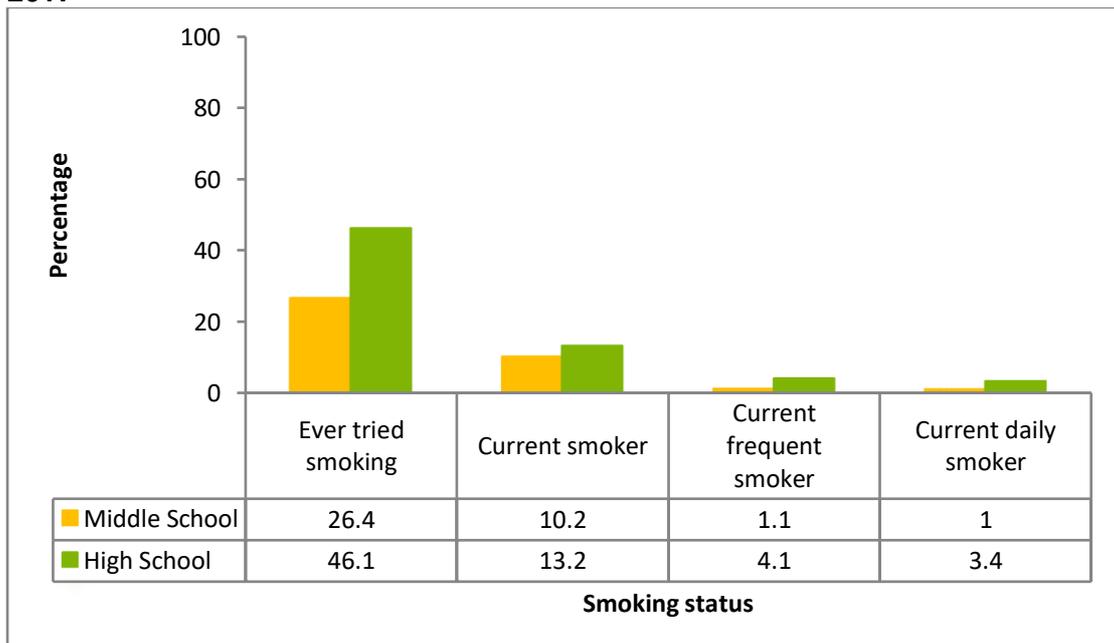
Figure 22. Smoking prevalence, high school youth, Guam vs. US, 2017



Source: GDOE, YRBS 2017; CDC, YRBS 2017

One in four middle school students had tried smoking in 2017, and one in ten were current smokers (Figure 23).

Figure 23. Smoking prevalence, middle school vs. high school students, Guam, 2017



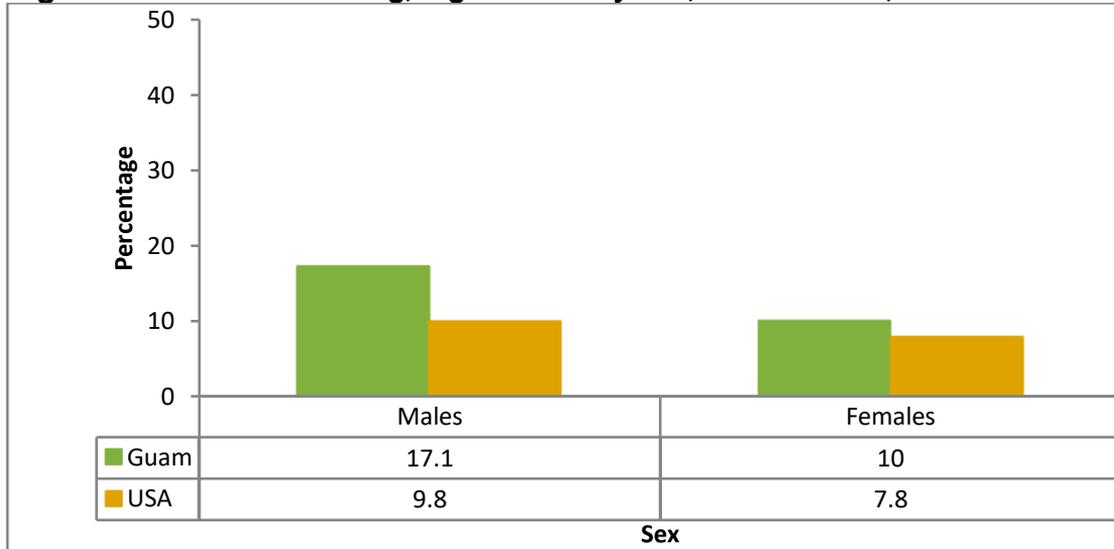
Source: GDOE, YRBS 2017; CDC, YRBS 2017

CORRELATES OF YOUTH SMOKING

Sex

In 2017, male high school students in Guam had a significantly higher smoking rate than females. Regardless of sex, smoking prevalence among high school students is higher in Guam compared to the US. Female youth in Guam smoke as much as male youth in the US (Figure 24), mirroring the adult situation.

Figure 24. Current smoking, high school by sex, Guam vs. US, 2017

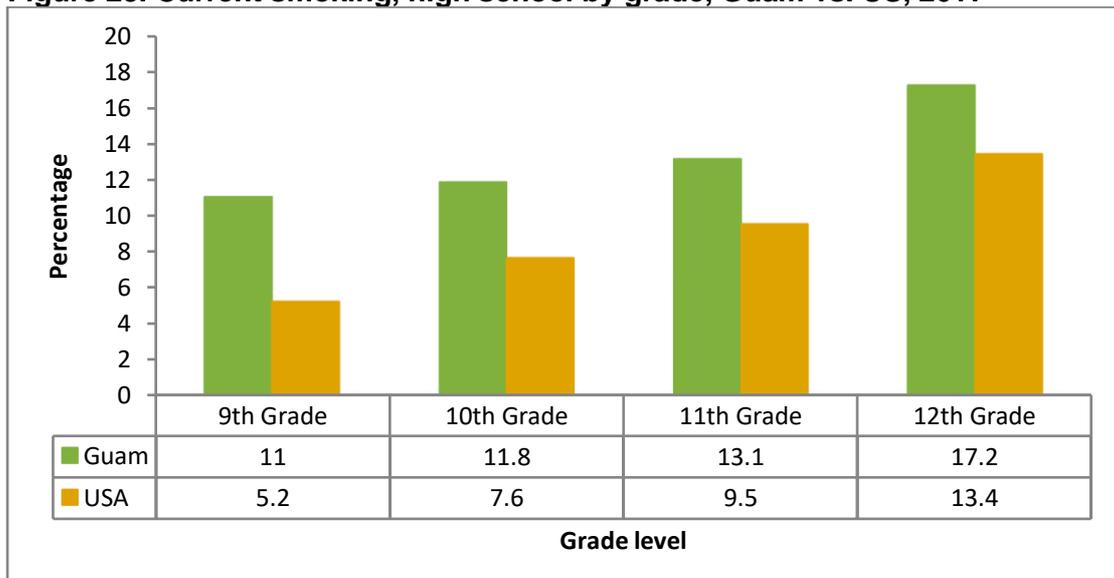


Source: GDOE, YRBS 2017; CDC, YRBS 2017

Grade

Smoking increases with grade level for Guam and US youth, but the prevalence rates are higher in Guam for every grade level, smoking prevalence is higher among Guam students (Figure 25). Together with data showing Guam youth are much more likely to start before the age of 13 years, this indicates that tobacco uptake begins long before the 9th Grade, and tobacco prevention interventions need to target lower Grade levels.

Figure 25. Current smoking, high school by grade, Guam vs. US, 2017

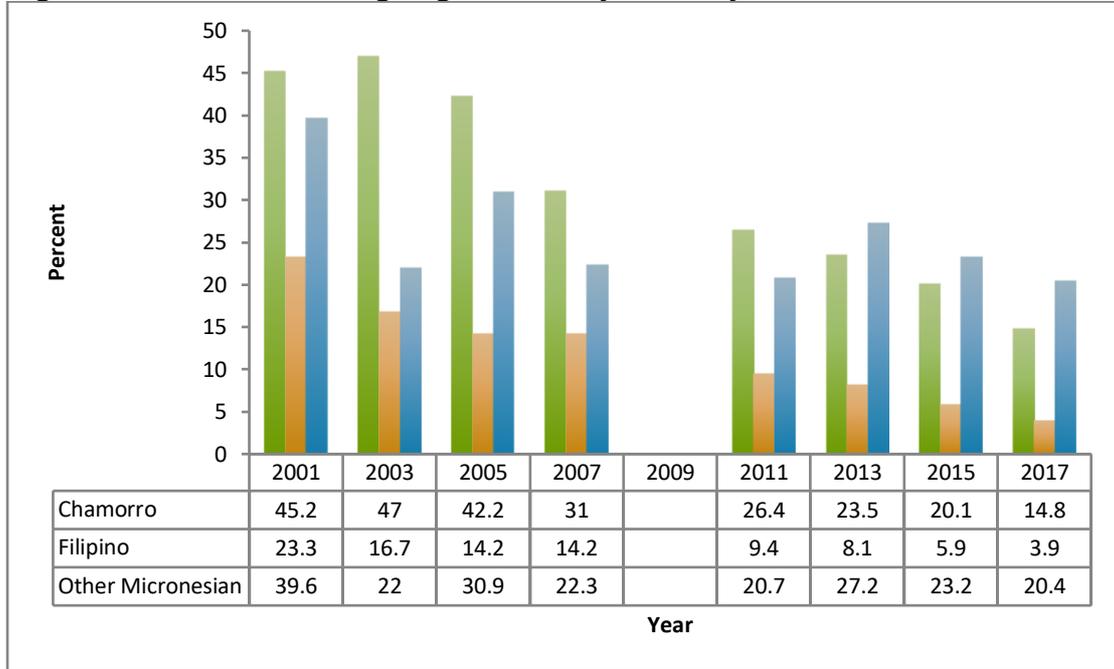


Source: GDOE, YRBS 2017; CDC, YRBS 2017

Ethnicity

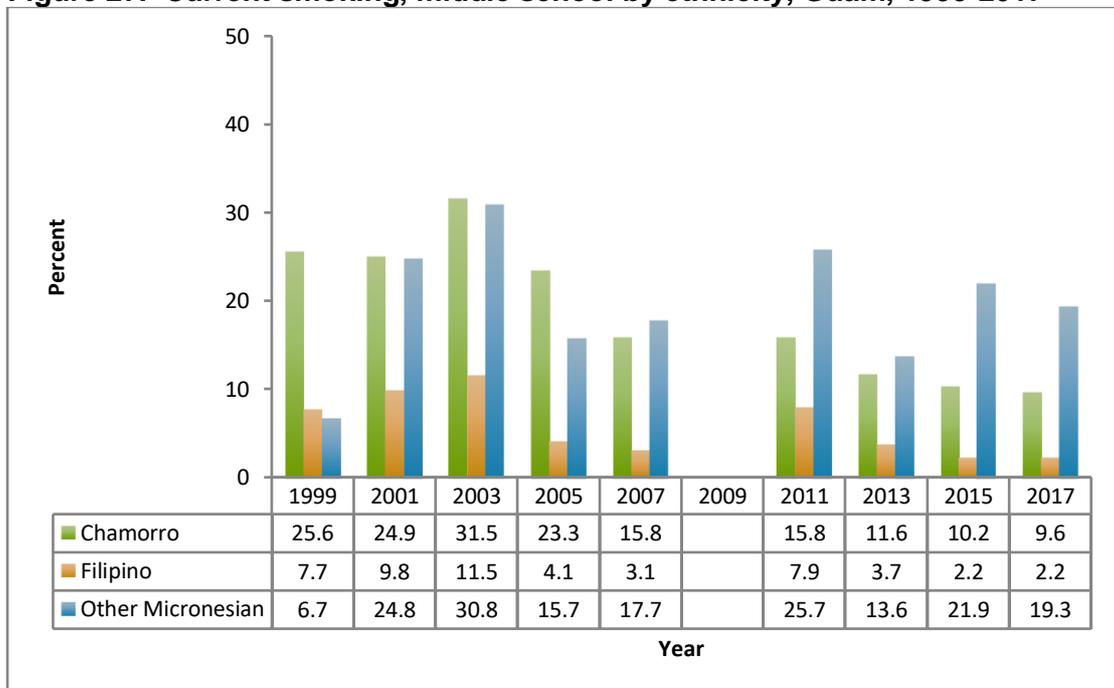
CHamorus and other Micronesians surpass Filipinos in all smoking parameters. This disparity has persisted throughout the entire period of data collection for the survey, despite the decline in overall youth smoking (Figures 26-27).

Figure 26. Current smoking, high school by ethnicity, 2001-2017



Source: GDOE, YRBS 2001-2017; NOTE: blank cells = data not available; the YRBS still uses the old spelling "Chamorro"

Figure 27. Current smoking, middle school by ethnicity, Guam, 1999-2017



Source: GDOE, YRBS 1999-2017; blank cells = data not available
Note: the YRBS still uses the old spelling "Chamorro"

Age at initiation

Nearly one in four (23.7%) of Guam high school students smoked a whole cigarette for the first time before the age of 13 years, and 13.3% of middle school students smoked their first whole cigarette before the age of 11 years. Males were as likely as females to start tobacco use early (High school: 25.4% vs. 22.4%; Middle school: 13.6% vs. 12.9%).

Risk and protective Factors

In 2017, Guam conducted the Global Youth Tobacco Survey (GYTS) to determine youth's exposure to secondhand smoke, pro- and anti-tobacco messaging, access and availability of tobacco products and knowledge and attitudes about tobacco use. Data for youth aged 13 to 15 years showed:

- 39.8% of students were exposed to tobacco smoke at home.
- 47.1% of students were exposed to tobacco smoke inside enclosed public places.
- Less than 1 in 5 (17.4%) have ever received help/advice from a professional or program to stop smoking.
- 22.9% of current cigarette smokers bought cigarettes from a store, shop, gas station, flea market, or night market.
- Among current cigarette smokers who tried to buy cigarettes, 47.7% were not prevented from buying them because of their age.
- Almost 6 in 10 (57.0%) students noticed anti-tobacco messages in the media.
- More than half (53.7%) noticed tobacco advertisements or promotions when visiting points of sale.
- Almost 2 in 10 (18.4%) had something with a tobacco brand logo on it.
- Over half (57.5%) of students definitely thought other people's tobacco smoking is harmful to them.

These data point towards policy gaps in tobacco control legislation that need to be addressed, including point-of-sale and marketing promotions bans, stronger enforcement of Guam's Natasha Act and no sales to minors law, and broader cessation outreach to disseminate brief cessation advice, especially at health care delivery centers.

Smokeless Tobacco

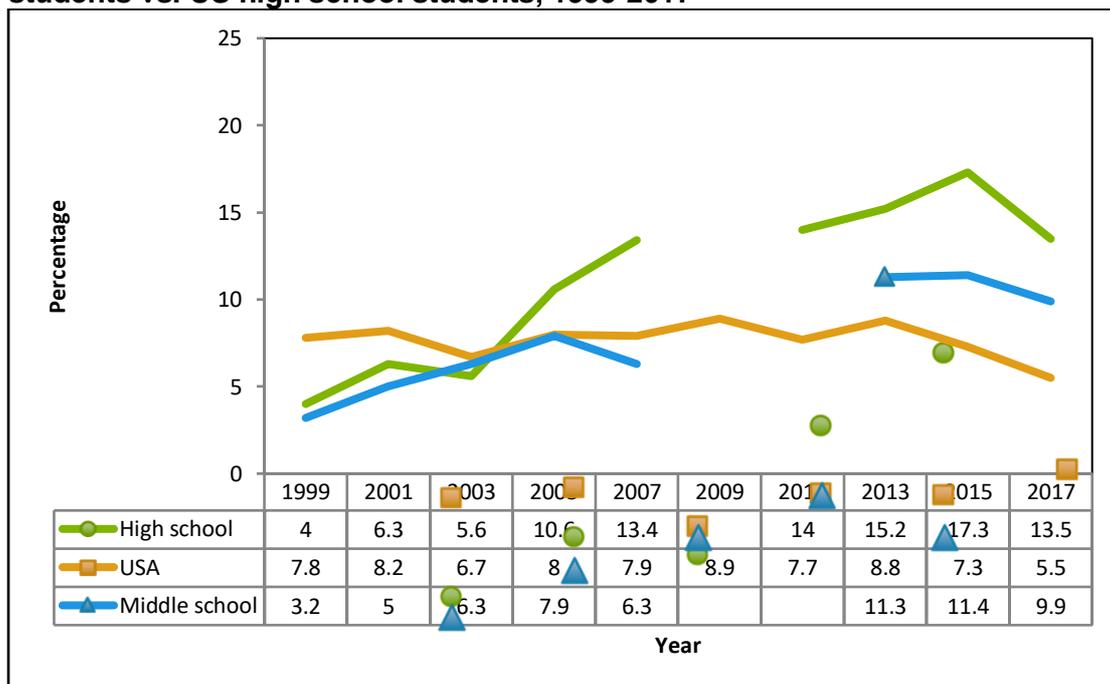
TREND

Previous editions of the Guam Epi Profile have flagged youth smokeless tobacco use for close monitoring.

The use of smokeless tobacco products with or without betel nut (areca nut/betel quid) is less prevalent than cigarette smoking among Guam's youth. However, while the actual numbers of users are small, the rates of smokeless tobacco use among both high school and middle school youth in Guam are higher than the US median (Figure 28).

The rates for high school youth doubled between 2003 and 2005 and increased further from 2011 to 2015, before declining in 2017. The YRBS dropped the question on smokeless tobacco use for middle school students in 2011 but reinstated it in 2013. Data indicated that middle school smokeless tobacco use in Guam surpassed the US high school rate from 2013 onward. The use of other tobacco products deserves careful tracking, and prevention and early intervention efforts are needed to offset any further increases.

Figure 28. Smokeless tobacco use, Guam high school and middle school students vs. US high school students, 1999-2017



Source: GDOE, YRBS 1999-2017; CDC, YRBS 1999-2017; blank cells = data not available

PREVALENCE

In 2017, 13.5% of high school students and 9.9% of middle school students reported smokeless tobacco use. The prevalence of smokeless tobacco use among Guam middle school students is nearly 50% higher than the rate among US high school students.

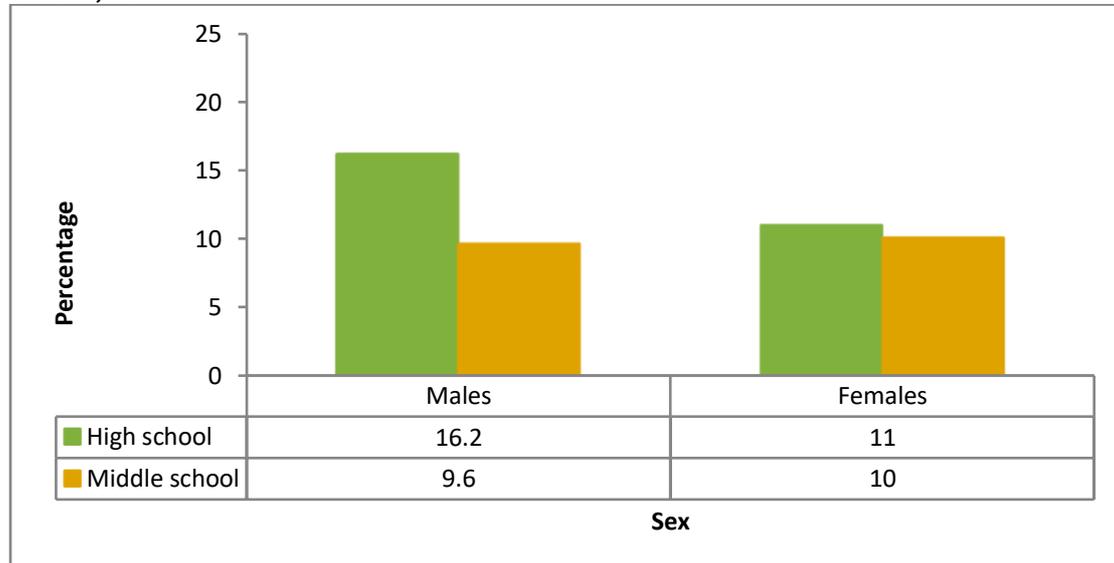
CORRELATES OF YOUTH SMOKELESS TOBACCO USE

Sex

Among high school students, males have a higher prevalence of using smokeless tobacco products than females. However, there is no sex difference among middle

school students. About one in 10 (10%) middle school girls were current users of smokeless tobacco in 2017; the rate is similar to the prevalence among high school females (Figure 29).

Figure 29. Smokeless tobacco use, by sex, high school vs. middle school, Guam, 2017

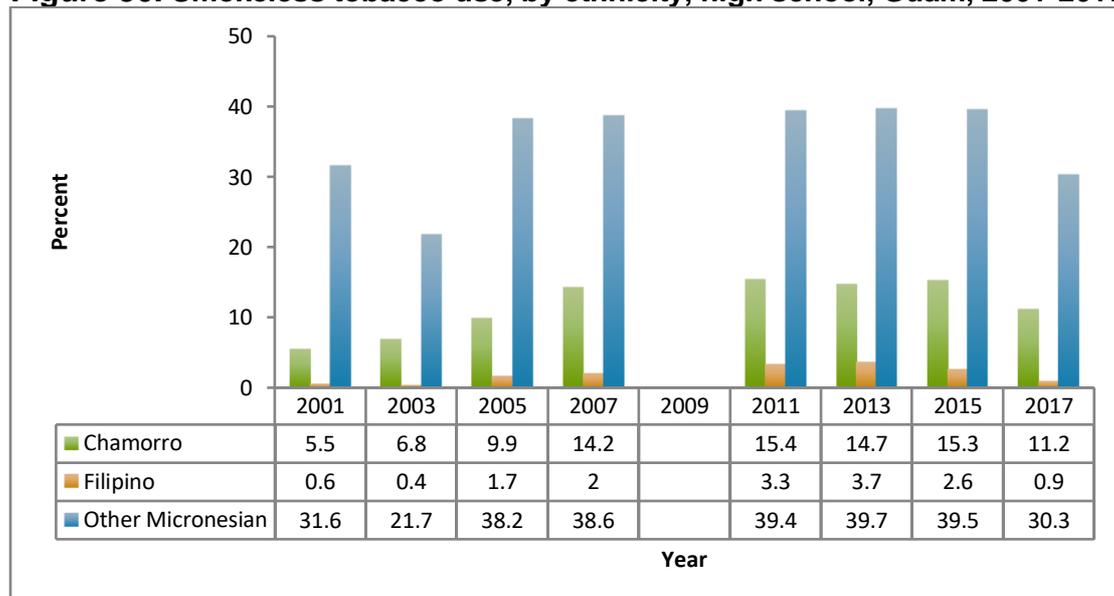


Source: GDOE, YRBS 2017; CDC, YRBS 2017

Ethnicity

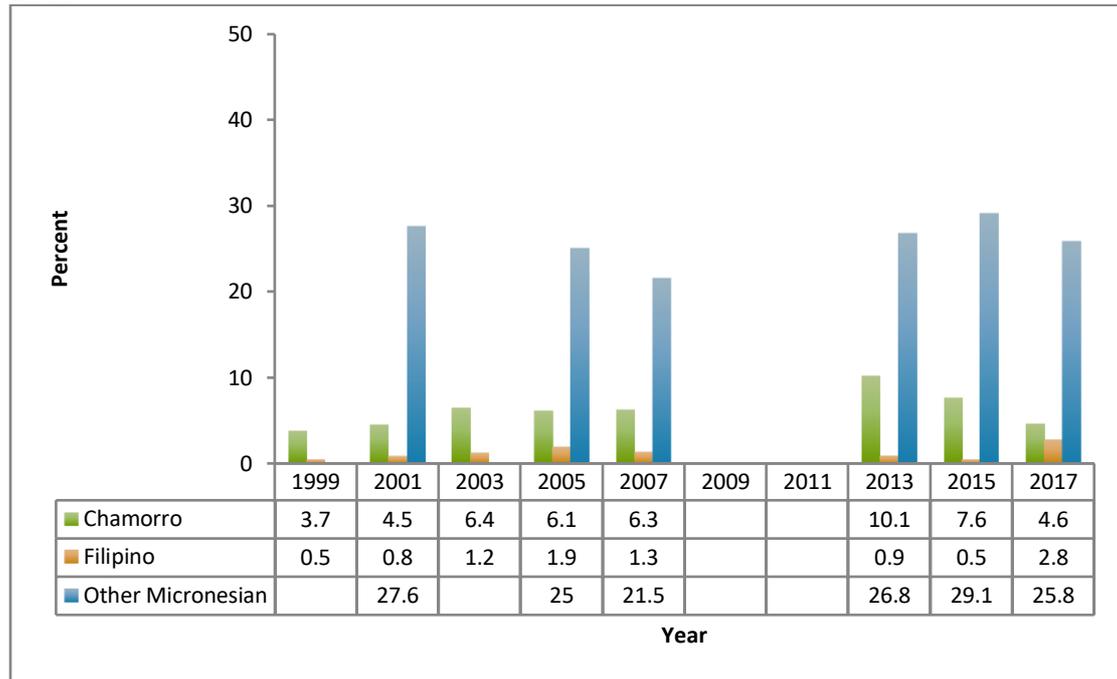
The use of smokeless tobacco products is highest among Micronesians. The difference between Micronesians and all other ethnic categories is remarkable (Figures 30 and 31). It is unclear what proportion of youth are using smokeless tobacco products as is, and what proportion are using these as additives to betel nut (areca nut/betel quid). In future iterations of the YRBS on Guam, it will be important to ask specific questions about the use of chewing tobacco, with and without betel nut (areca nut/betel quid).

Figure 30. Smokeless tobacco use, by ethnicity, high school, Guam, 2001-2017



Source: GDOE, YRBS 2001-2017; Note: blank cells = data not available; the YRBS still uses the old spelling "Chamorro"

Figure 31. Smokeless tobacco use, by ethnicity, middle school, Guam, 2001-2017



Source: GDOE, YRBS 2001-2017; blank cells = data not available
 Note: the YRBS still uses the old spelling "Chamorro"

Electronic Vapor Products (E-cigarettes and other Electronic Nicotine Delivery Systems)

In 2015, questions on electronic vapor products (e-cigarettes, e-cigars, e-pipes, etc.) were added to the Guam YRBS, for both high school and middle school. Lifetime use of these products in 2017 was 65.9% among high school students and 35.9% among middle school students. One in four (26.5%) of high school students and nearly one in four (23.5%) middle school students reported current use. These are significantly higher than the US median (Figure 32). Males were more likely to report current use; CHamorus had the highest rates of current use for both middle school and high school.

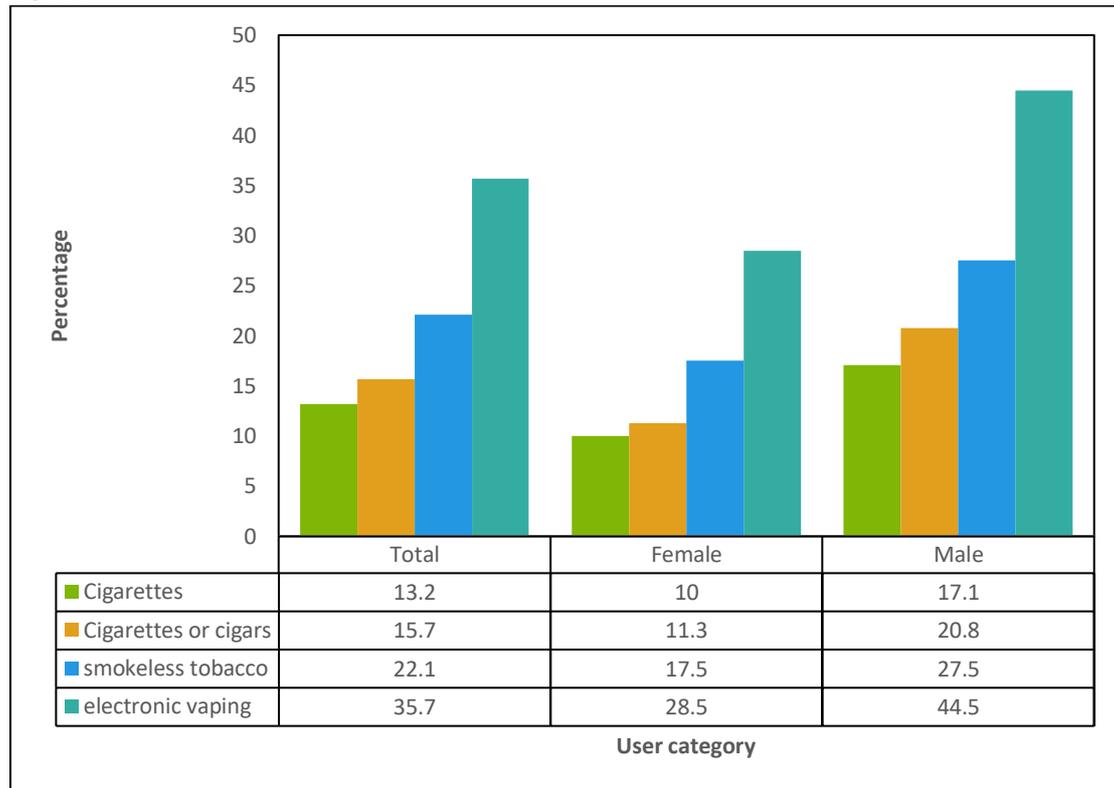
Figure 32. Current electronic vapor product use, middle and high school students, Guam vs. US, 2015-2017.



Source: GDOE, YRBS 2015-2017; CDC, YRBS 2015-2017

Electronic vapor product use surpassed smokeless and smoking in 2017, for both males and females. Smoking is now the least prevalent form of tobacco use for Guam's high school youth (Figure 33).

Figure 33. Current tobacco product use, high school students, Guam, by sex, 2017.



Source: GDOE, YRBS 2017

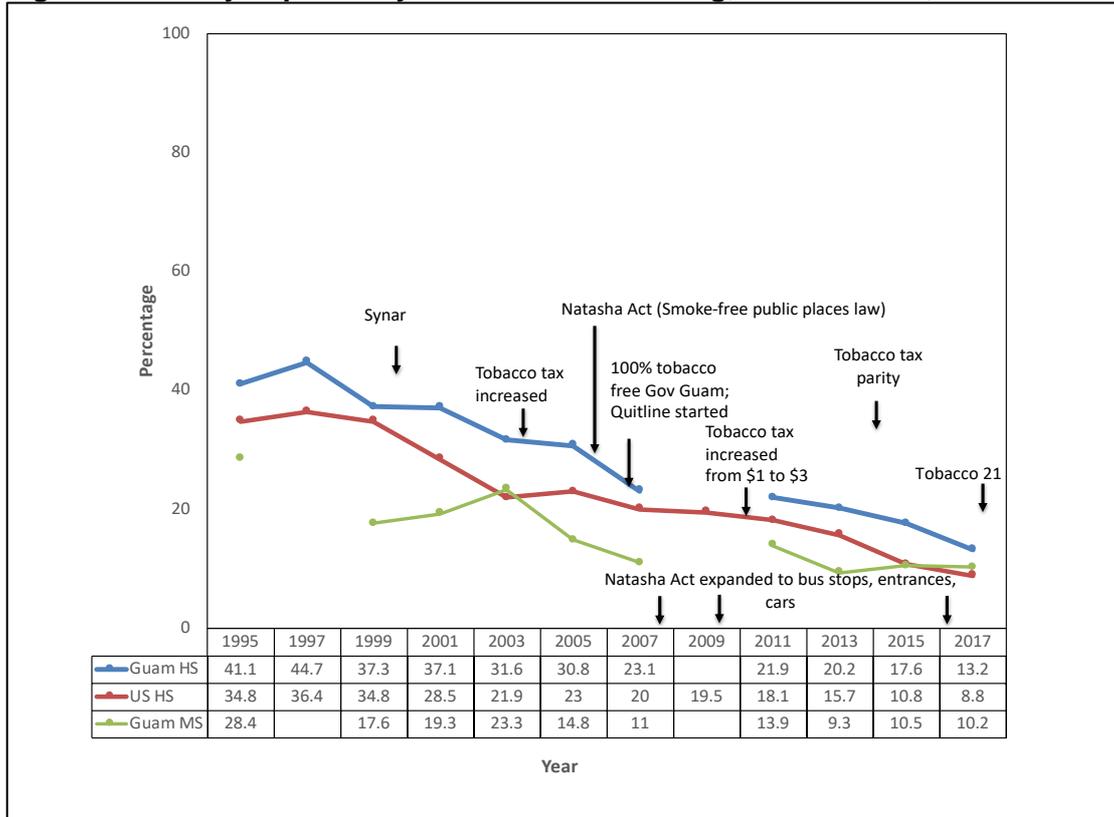
Policy impact on tobacco consumption

Youth tobacco use in Guam is responsive to policy changes.

Large declines in youth smoking prevalence coincide or follow the establishment of evidence-based tobacco control policies. SYNAR inspections started on Guam in 1999, tobacco taxes were increased on Guam in 2003, and a sustained tobacco control program was launched by the GBHWC since 2003. In 2005, Guam’s Natasha Act, making public places smoke-free, was enacted. In 2007, the Governor’s Executive Order mandating all GovGuam premises and vehicles to become 100% tobacco free came into effect, and the DPHSS Quitline was established. Tobacco taxes were raised further in 2010, from \$1.00/pack to \$3.00/pack; this represents one of the largest single tax increases among all US States and Territories. Guam’s smoke-free public places policy was expanded in 2007, 2009 and 2016. In 2014, a tobacco tax parity law was enacted, followed by legislation to raise the legal age for consumption of tobacco products to 21 years in 2017 (Figure 33).

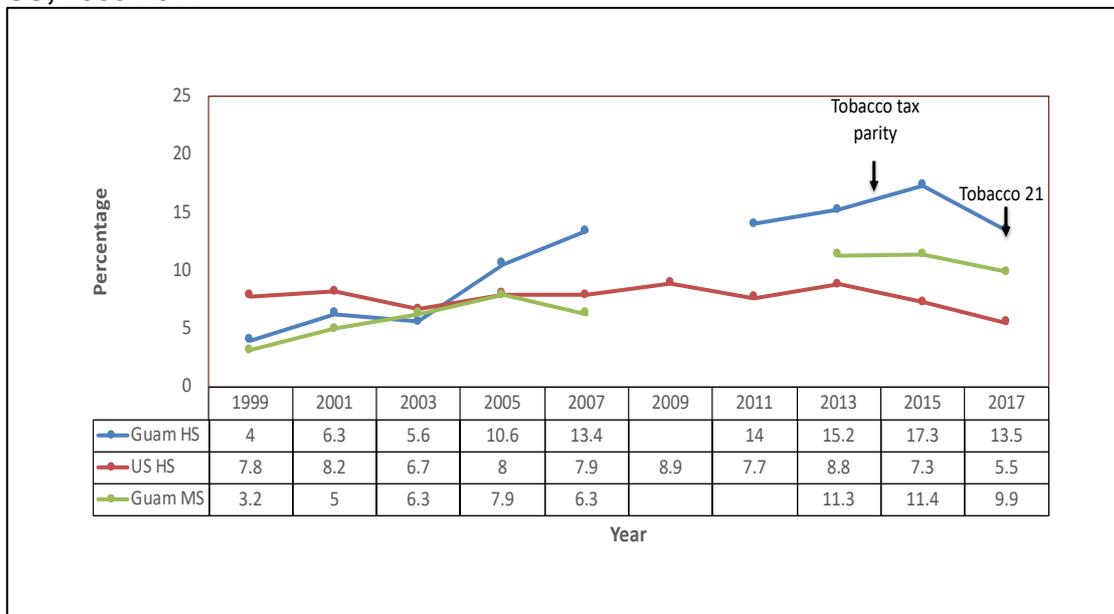
Youth smokeless tobacco use was steadily increasing until after the passage of the tobacco tax parity law in 2014 and legislation that increased the legal age for tobacco consumption from 18 to 21 years in 2017 (Figure 34).

Figure 33. Policy impact on youth tobacco smoking, Guam vs. US, 1995-2017



Source: GDOE, YRBS 1995-2017; CDC, YRBS 1995-2017; Guam Compendium of Laws; blank cells = data not available

Figure 34. Policy impact on youth smokeless tobacco consumption, Guam vs. US, 1999-2017



Source: GDOE, YRBS 1999-2017; CDC, YRBS 1999-2017; Guam Compendium of Laws; blank cells = data not available

The Synar law and cigarette purchases by youth

Guam initiated its annual unannounced tobacco vendors' inspections in 1999, in compliance with the Synar law. Compliance rates reached federal targets in 2003 and have remained better than the target since then. Guam's retail violation rate went below 5% in 2013 and remained below 5% until 2018, when the violation rate increased to 12.1%

The YRBS provides information on youth smokers who purchase their cigarettes from stores (Table 12). The data indicates that 6.5% of high school smokers and less than 5% of middle school smokers purchased cigarettes from a store in 2015. The percentage of high school smokers who bought their cigarettes from a store has been declining since 2001, but the middle school percentage rose from 2007 to 2013, despite low retailer violation rates during the annual tobacco retailers' inspection. The middle school rate decreased in 2015. This question was not asked in 2017. However, the 2017 GYTS data for youth aged 13-15 years documented that 22.9% of current smokers bought their cigarettes from a retail source and 47.7% were not prevented from purchasing these products because of their age.

These data highlight the importance of consistent enforcement of the Synar law and the need and effectiveness of a comprehensive approach to tobacco use prevention among youth, utilizing both price and non-price measures to reduce demand for tobacco products, to complement the restriction in youth access to tobacco.

Table 12. Tobacco retailer violation rates and percent of youth purchasing cigarettes from a store, Guam, 2000-2018

Year	Retailer violation rate (%)	MS Bought Cigarettes (%)	HS Bought Cigarettes (%)
2000	33.0	---	---
2001	42.0	1.1	30.0
2002	20.2	---	---
2003	11.0	0.8	27.9
2004	18.3	---	---
2005	14.9	3.6	24.5
2006	5.0	---	---
2007	9.4	3.8	17.3
2008	6.0	---	---
2009	8.9	N/A	N/A
2010	11.6	---	---
2011	7.8	7.0	13.0
2012	7%	---	---
2013	5%	8.4	10.5
2014	4%	---	---
2015	4.4%	3.9	6.5
2016	4.7%	---	---
2017	4.8%	---	---
2018	12.1%	---	---

Source: GBHWC PEACE Office, Synar reports, 2000-2018; GDOE, YRBS 2001-2017;
 Note: "----" = data not collected for that year; "N/A" = data not available

Tobacco: Consequences

Four of the top ten causes of death---diseases of the heart, malignant neoplasms (cancer), cerebrovascular disease (stroke) and diseases of the respiratory system---are directly caused by tobacco. An additional two---pneumonia, and septicemia---are worsened by tobacco use (Table 13).

Table 13. Top Ten Causes of Death: Guam, 2017

Rank	Cause of Death	# of deaths	% of all deaths	Death rate
1	Cardiovascular Diseases	339	33.7	206.9
2	Malignant Neoplasms	170	16.9	103.7
3	Septicemia	50	5.0	30.;5
4	Cerebrovascular Disease	47	4.7	28.7
5	Diseases of the digestive system	45	4.5	27.5
6	Diseases of the genitourinary system	45	4.5	27.5
7	Pneumonia	43	4.3	26.2
8	Suicide	36	3.6	22.0
9	Injury, poisoning and certain. Other consequences of external causes	30	3.0	18.3
10	Diseases of the respiratory system	26	2.6	15.9

Source: Guam Department of Public Health and Social Services, Office of Vital Statistics Death Certificates, as reported in the 2017 Guam Statistical Yearbook, 2018

NOTE: Death rate per 100,000 population (population projection for 2017 was 163,875 persons)

In relation to cancer, the Guam Comprehensive Cancer Control Program of the Department of Public Health and Social Services (DPHSS) released cancer registry data from 2008-2012. All of the top causes of cancer death on Guam are tobacco-related (Table 14). Lung, colon, and liver cancer are related to smoking. Secondhand smoke exposure has been implicated as a risk factor for breast cancer.

Lung cancer is now the major cause of cancer mortality on Guam for both males and females. Thus, cancer mortality data highlight the critical importance of further reducing tobacco use among Guam's people. Because secondhand smoke also raises cancer risk, interventions to curb tobacco use will protect not only the tobacco users, but also all others who would have been exposed to tobacco smoke.

Table 14. Top causes of cancer death on Guam, by sex, 2008-2012

Top Causes of Cancer Death on Guam 2008-2012	
Males	Females
Lung and Bronchus*	Lung and bronchus*
Liver *	Breast**
Colon and Rectum*	Colon and Rectum*

Source: Guam Comprehensive Cancer Control Program, DPHSS, Guam Cancer Facts and Figures 2008-2012 (David et al)

Note: * related to smoking; ** related to secondhand smoke exposure

Cigarette butts comprised the second most common type of debris found on land or water in Guam, making up 16.2% of environmental garbage.

Electronic Vapor Products: Consequences

To date, there has been one recorded case of traumatic injury due to an exploding electronic cigarette in Guam. The patient sustained severe injuries to his eyeball, face and hand and required facial reconstructive surgery to repair the damage (Pacific Daily News, August 2016).

Reports from the Guam Department of Education indicate that there were at least 2 known cases of e-cigarettes exploding, leading the GDOE to request the Guam Police Department to handle and dispose of all e-cigarette and vape paraphernalia confiscated at the schools from students. (Personal communication with GDOE Chris Anderson, February 2018).

In 2018, doctors from the Guam Regional Medical City (GRMC) published a journal article documenting a case of diffuse alveolar hemorrhage in a 33-year old Guam male who had been aggressively vaping in the period prior to developing pulmonary symptoms. (M. Agustin, et, al, 2018).

Alcohol

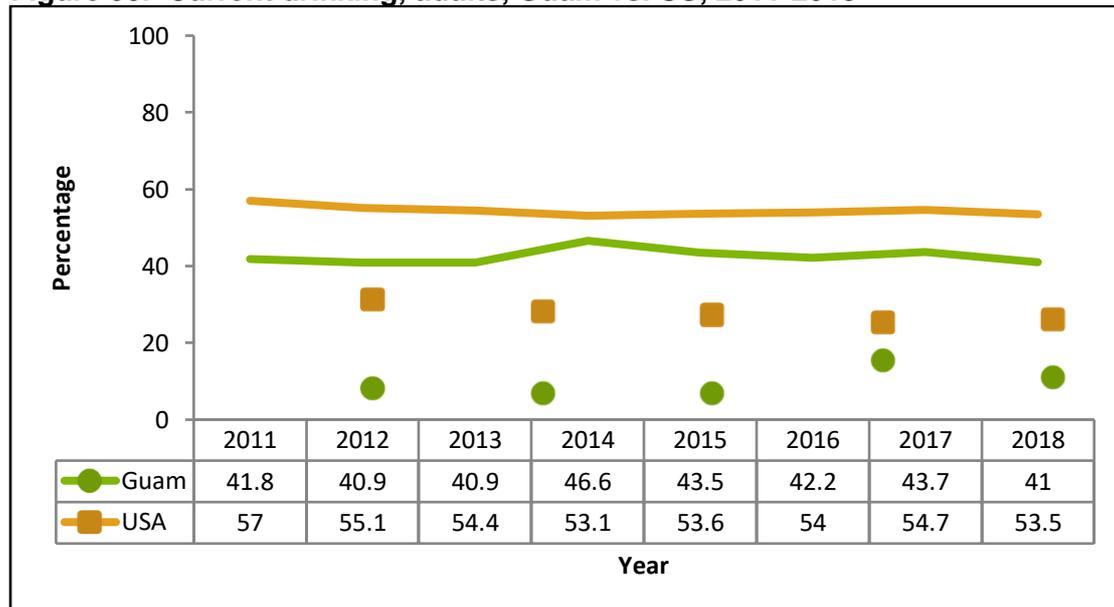
Consumption: Adults

Current Alcohol Use

TREND and PREVALENCE

The BRFSS defines current alcohol use as having had at least 1 drink of alcohol in the past 30 days. Current alcohol consumption in Guam remained unchanged from previous years. In 2018, 41% of adults on Guam reported having had at least one drink of alcohol within the past 30 days (Figure 35). Current drinking among adults is lower in Guam than in the US.

Figure 35. Current drinking, adults, Guam vs. US, 2011-2018



Source: Guam DPHSS, BRFSS, 2011-2018; CDC, BRFSS 2011-2018

CORRELATES

Sex

Overall, men drink more than women. (Figure 36).

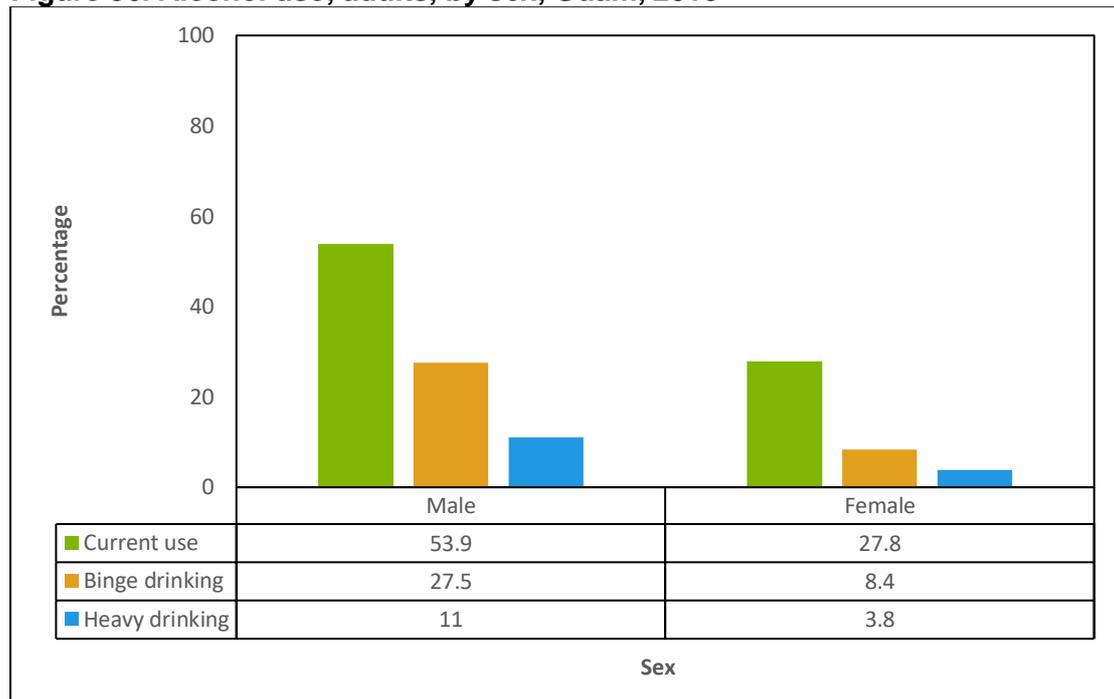
Other Correlates

There were no clearly delineated associations between educational attainment, income and current drinking.

Age at First Use of Alcohol

Nearly 60% of Guam adults reported first using alcohol before the age of 21, which is currently the legal age for consumption. One-third (32%) had their first drink between the ages of 10 to 17. Three percent (3%) of the adults surveyed reported trying alcohol for the first time at or before the age of 12 years.

Figure 36. Alcohol use, adults, by sex, Guam, 2018



Source: Guam DPHSS, BRFSS, 2018

Ethnicity

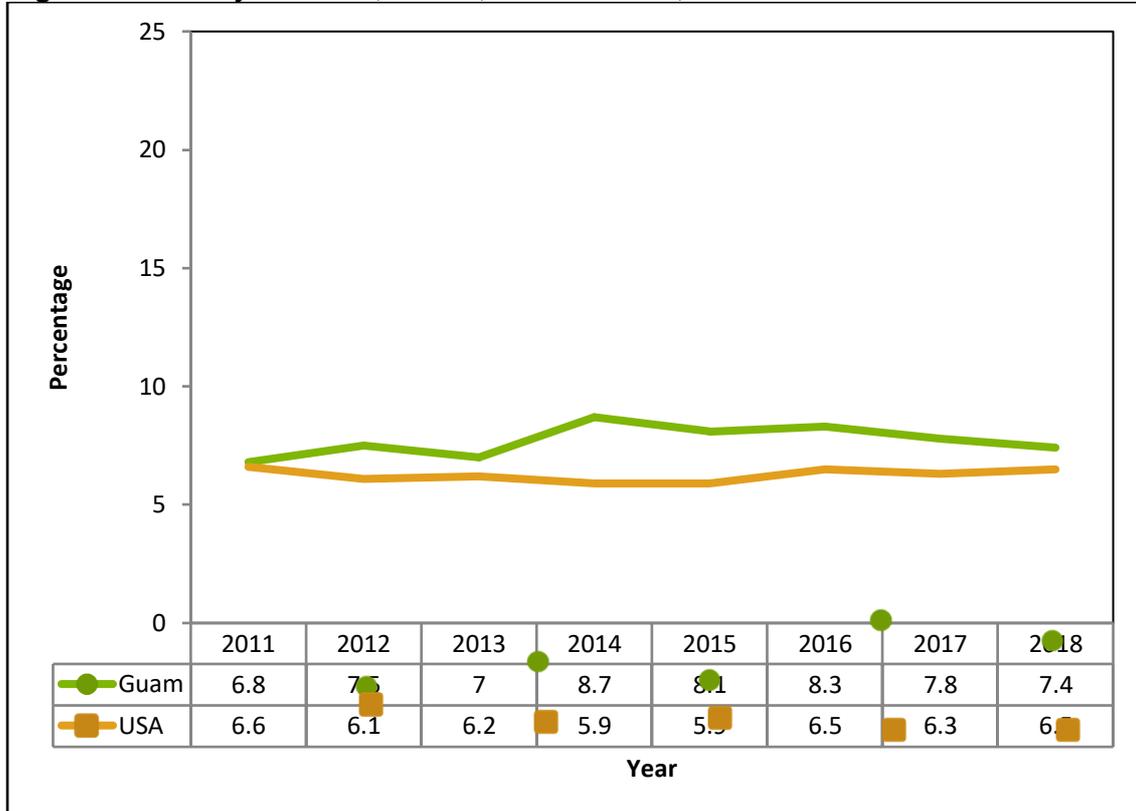
Whites/Caucasians and had a markedly higher prevalence of current drinking (70.9%) compared to CHamorus (36.7%), Filipinos (34.5%) and Micronesians (30.4%).

Heavy Alcohol Use

TREND and PREVALENCE

Heavy drinking is defined in the BRFSS as adult men having more than two drinks per day and adult women having more than one drink per day. The prevalence of heavy drinking on Guam is higher than the US average (Figure 37).

Figure 37. Heavy drinkers, adults, Guam vs. US, 2011-2018



Source: Guam DPHSS, BRFSS, 2011-2018; CDC, BRFSS 2011-2018

CORRELATES

Sex

Males were more likely to report heavy drinking than females (Figure 36).

Income

Because of the small numbers of respondents reporting heavy drinking, it is difficult to ascertain relationships between heavy drinking and income.

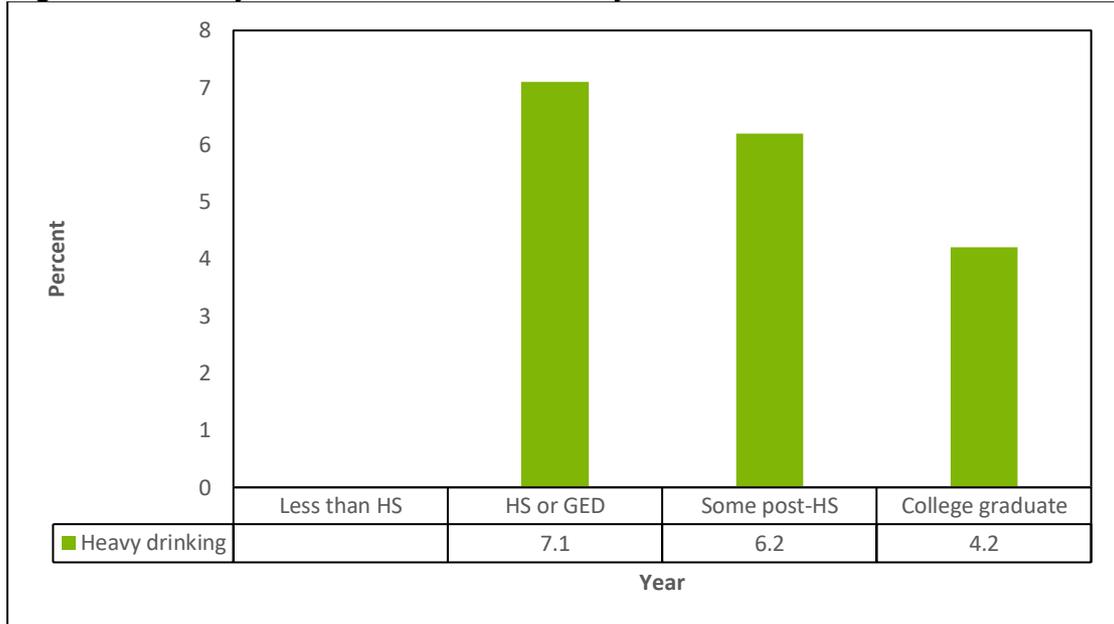
Education

Heavy drinking appears to be less likely among those with the highest level of educational attainment (Figure 38).

Ethnicity

Whites/Caucasians (10.4%) and Micronesians (10.1%) had rates of heavy drinking compared to Chamorus (7.1%) and Filipinos (2.4%).

Figure 38. Heavy drinkers, adults, Guam, by educational attainment, 2018



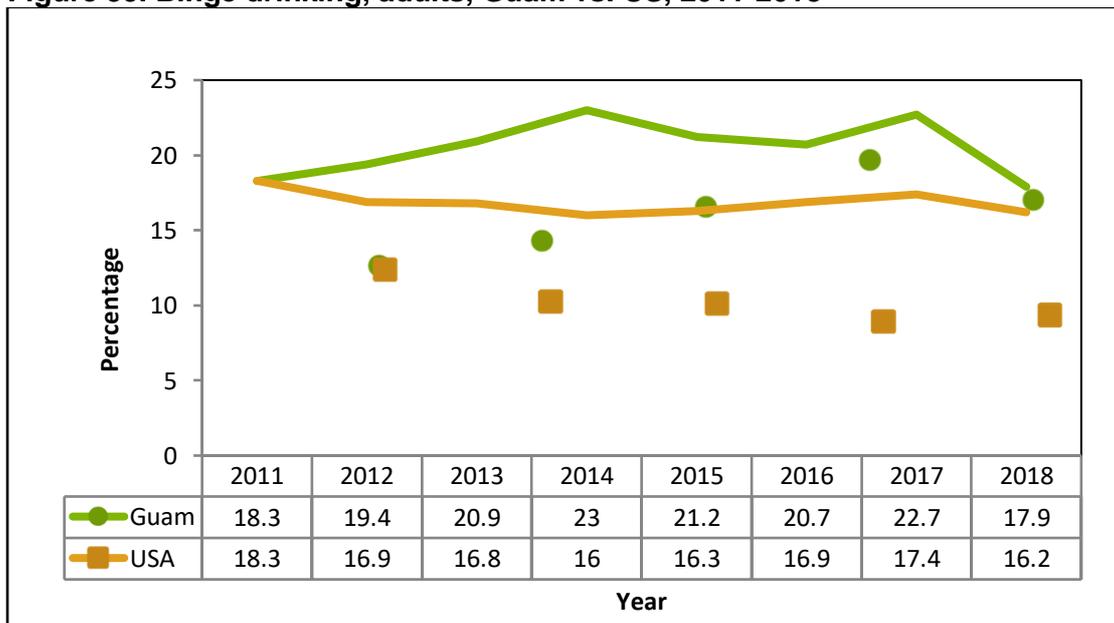
Source: Guam DPHSS, BRFSS, 2018; Note: blank cells = data not available

Binge Drinking

TREND and PREVALENCE

Binge drinking, defined as having five or more drinks on one occasion, was reported by 17.9% of adults on Guam in 2018 (Figure 39). The trend appeared to be increasing for Guam until 2014; since then, binge drinking prevalence has been trending downwards. Of note, Guam passed its “Responsible Alcohol Sales and Service Act” in 2013, with implementation started in 2014; this law mandates training of all licensed alcohol servers in preventing the sale of alcoholic beverages to persons under 21 years of age, recognizing falsified identification documents, denial of service to an intoxicated or unruly person and enforcement of hours of service and sale of alcoholic beverages.

Figure 39. Binge drinking, adults, Guam vs. US, 2011-2018



Source: Guam DPHSS, BRFSS, 2011-2018; CDC, BRFSS, 2011-2018

CORRELATES

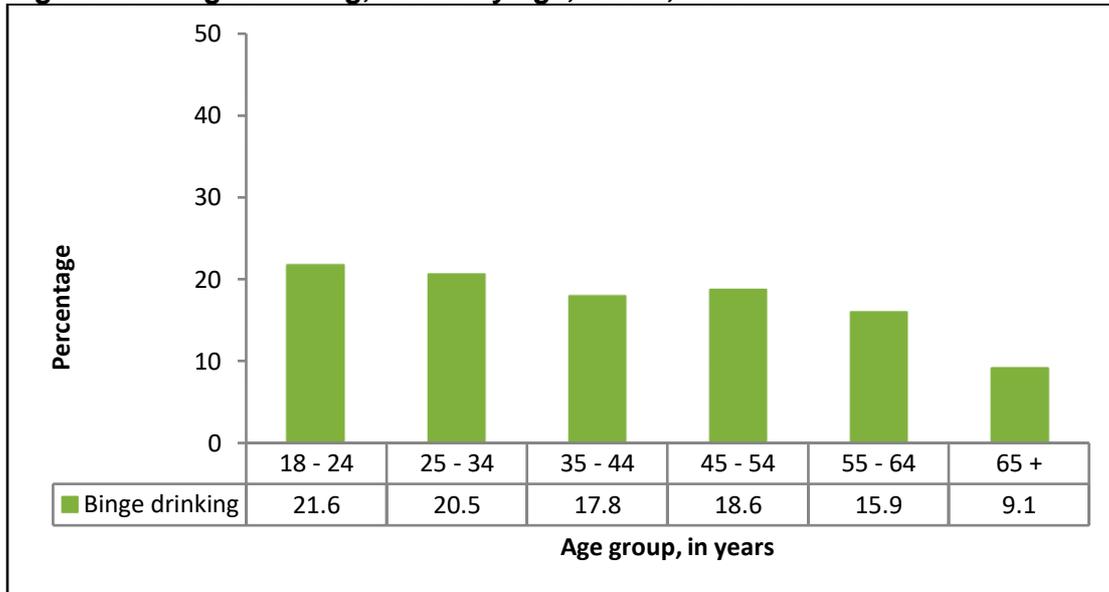
Sex

Males on Guam had a binge-drinking rate that was over three times higher than their female counterparts (Figure 36).

Age

Adults aged 18 - 34 years had the highest rates of binge drinking (Figure 40).

Figure 40. Binge drinking, adults by age, Guam, 2018



Source: Guam DPHSS, BRFSS, 2018

Income

Binge drinking is reported most by those at the extreme ends of the income scale (Figure 41).

Figure 41. Binge drinking, adults by income, Guam, 2018

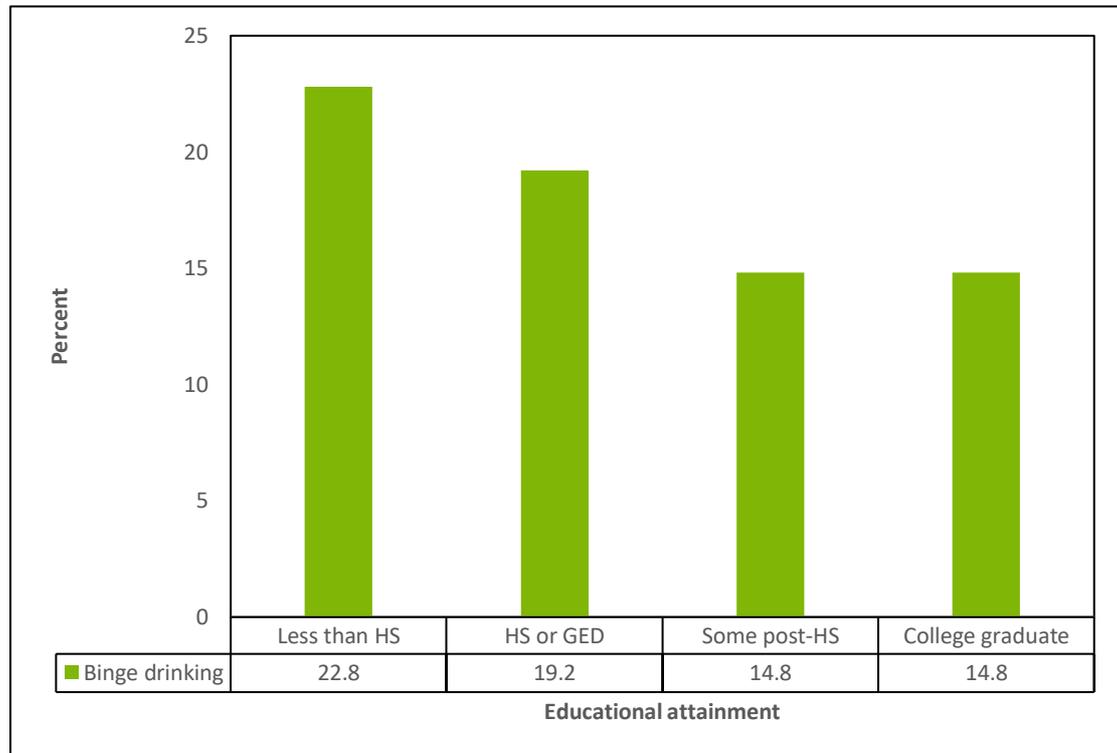


Source: Guam DPHSS, BRFSS, 2018

Education

Those with the lowest educational attainment are most likely to report binge drinking (Figure 42).

Figure 42. Binge drinking, adults by education, Guam, 2018



Source: Guam DPHSS, BRFSS, 2018

Ethnicity

Whites/Caucasians had the highest prevalence for binge drinking (27.7%) followed by Micronesians (20.5%), CHamorus (16.2%), Filipinos (11.1%) and other Asians (4.9%)

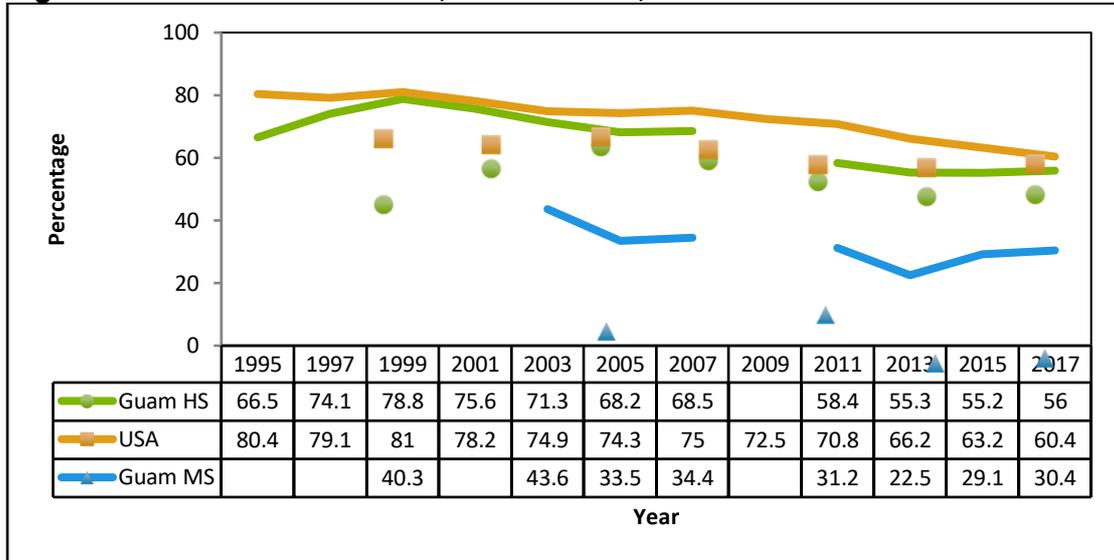
Consumption: Youth

Current and Lifetime Alcohol Use

TREND and PREVALENCE

Lifetime alcohol use among Guam high school students closely parallels the US rates (Figure 43). Current alcohol use is higher among US youth. The prevalence in Guam was increasing until 2001. The rate is declining over time (Figure 44).

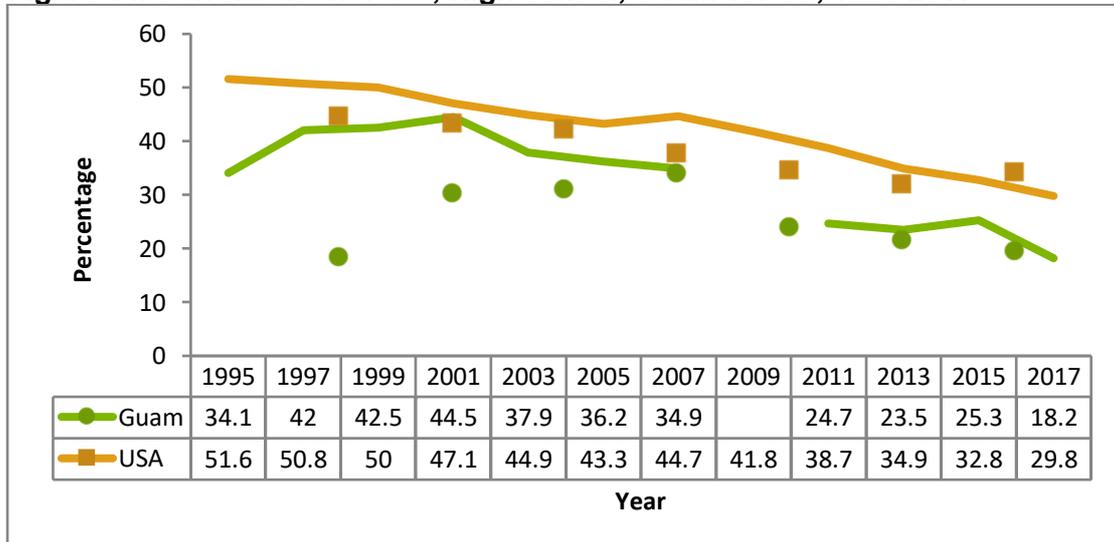
Figure 43. Lifetime alcohol use, Guam vs. US, 1995-2017



Source: GDOE, YRBS 1995-2017; CDC, YRBS 1999-2017

Note: blank cells = data not available

Figure 44. Current alcohol use, High school, Guam vs. US, 1995-2017



Source: GDOE, YRBS 1995-2017

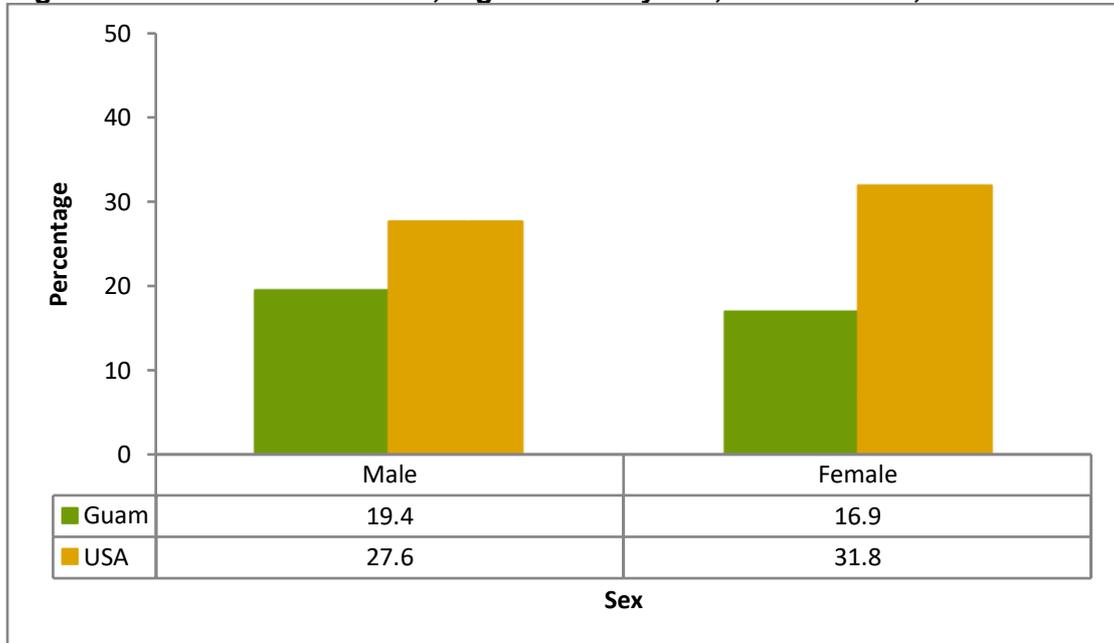
Note: blank cells = data not available

CORRELATES

Sex

In contrast to adults, and unlike youth tobacco use among high school students in Guam, current drinking is similar across the sexes. Regardless of sex, current alcohol use is lower in Guam (Figure 45).

Figure 45. Current alcohol use, high school by sex, Guam vs. US, 2017

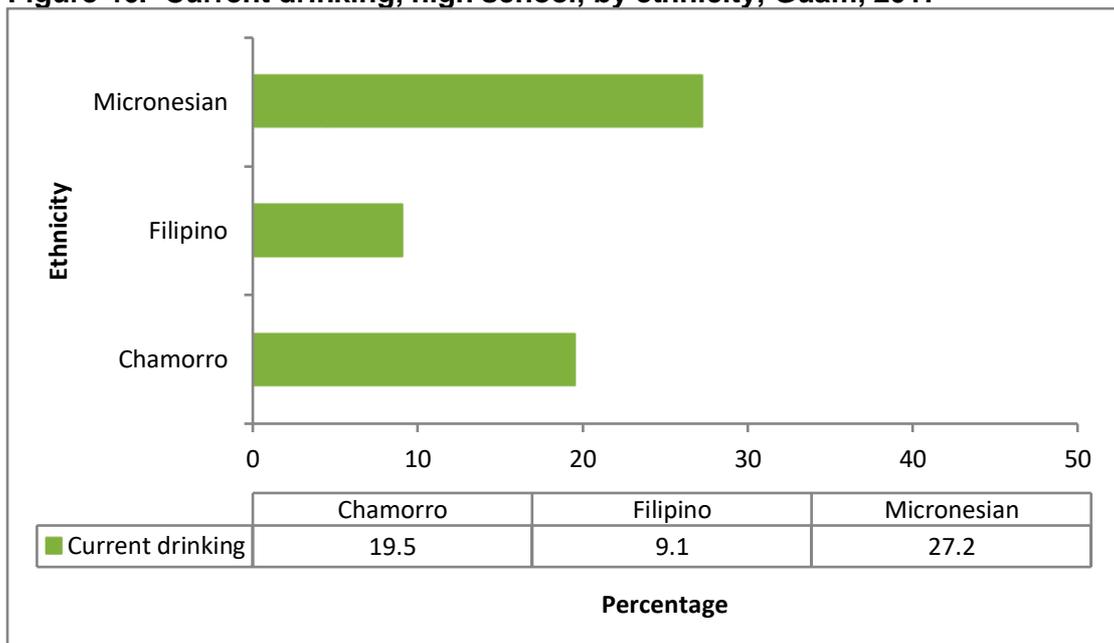


Source: GDOE, YRBS 2017

Ethnicity

When disaggregated by ethnicity/race, Filipino youth have the lowest rates for current alcohol use compared to Chamorro and other Micronesian youth (Figure 46).

Figure 46. Current drinking, high school, by ethnicity, Guam, 2017



Source: GDOE, YRBS 2017; Note: the YRBS still uses the old spelling "Chamorro"

Age at First Use of Alcohol

In 2017, 19.3% of high school students in Guam reported that they had their first alcoholic drink before the age of 13 years, while 11% of middle school students stated they had their first drink of alcohol before the age of 11 years.

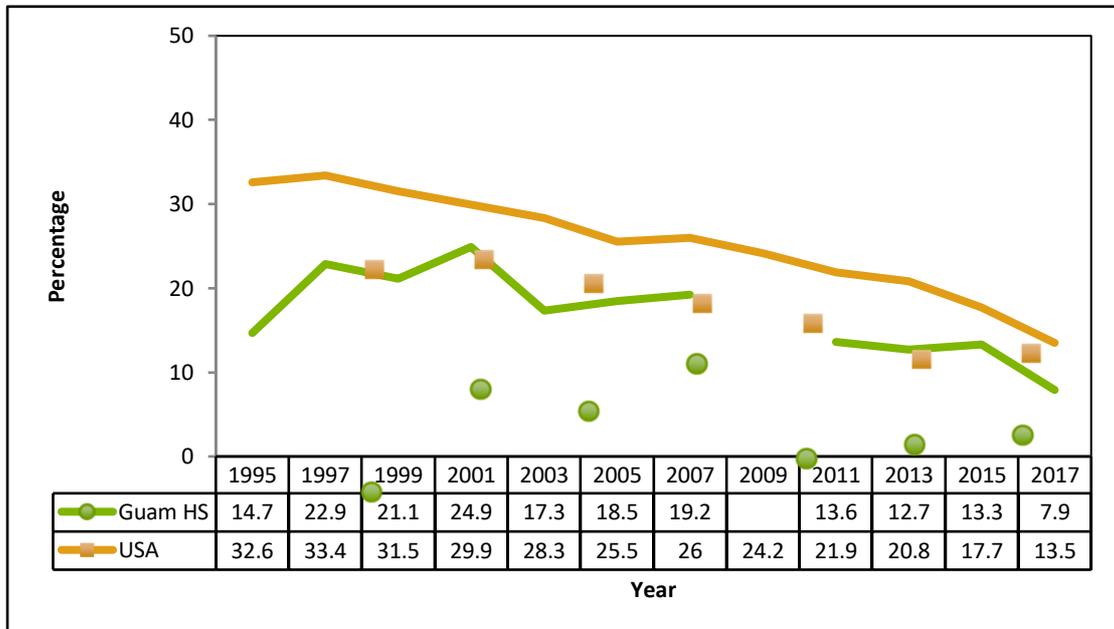
Binge Drinking

TREND and PREVALENCE

Binge drinking among youth is lower on Guam than on the US. In 2015, 13% of Guam high school students reported binge drinking, compared to 18% of high school students in the US (Figure 47).

From 1995 to 2001, US rates were decreasing while Guam rates were increasing. Thus, the difference between Guam and US rates was shrinking. In 2003, the binge-drinking rate decreased for the first time since 1995, followed by further declines in 2011 and 2017.

Figure 47. Binge drinking, high school: Guam vs. US, 1995 to 2017



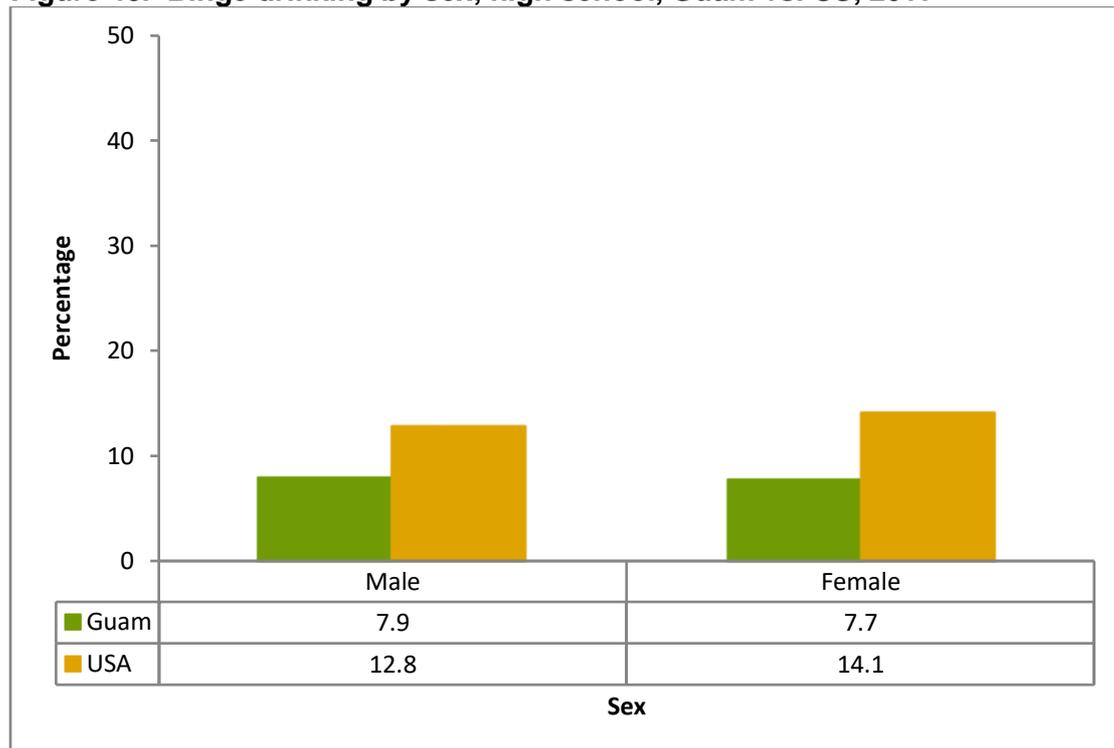
Source: GDOE, YRBS 1995-2017
 Note: blank cells = data not available

CORRELATES

Sex

In 2017, there was no difference noted in binge drinking rates across the sexes in Guam. Binge drinking prevalence was higher among US students, regardless of sex (Figure 48).

Figure 48. Binge drinking by sex, high school, Guam vs. US, 2017

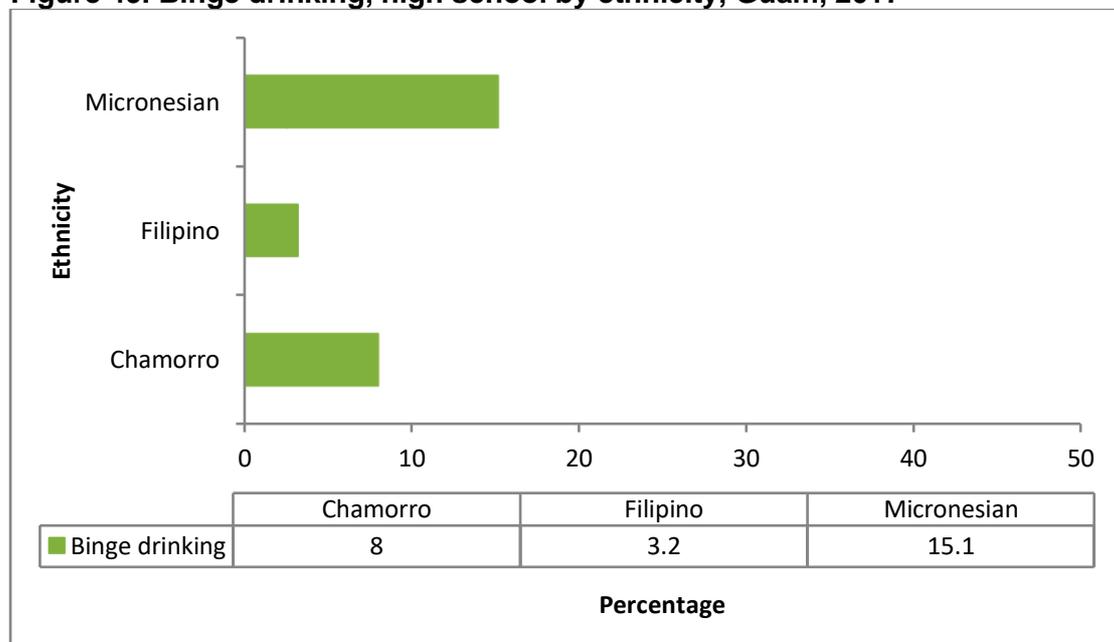


Source: GDOE, YRBS 2017

Ethnicity

Filipino youth have the lowest rates for binge drinking, while Micronesian youth have the highest (Figure 49).

Figure 49. Binge drinking, high school by ethnicity, Guam, 2017



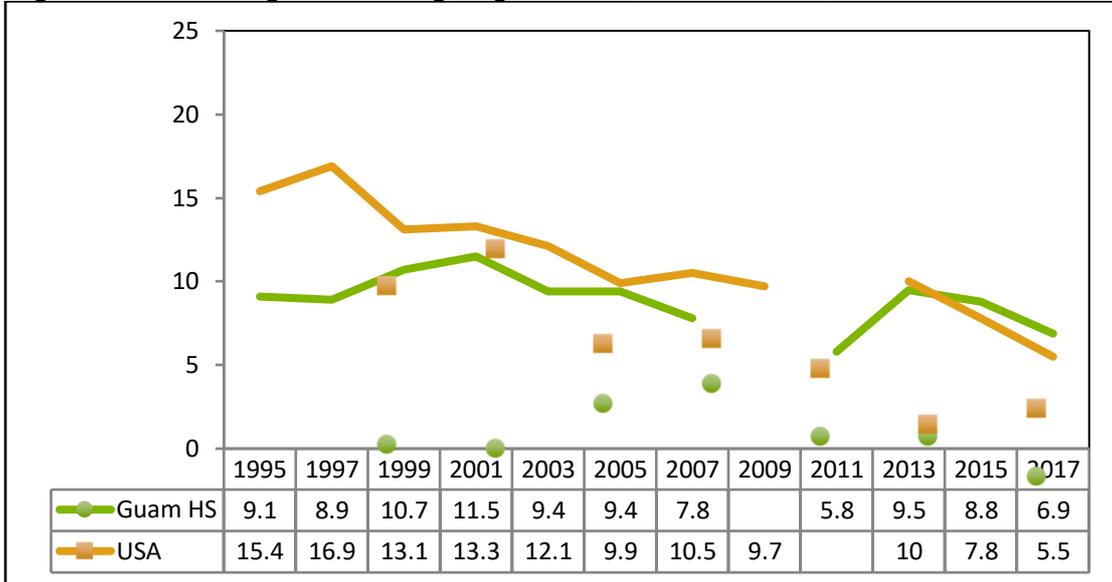
Source: GDOE, YRBS 2017

Note: the YRBS still uses the old spelling "Chamorro"

Drinking and Driving

Drinking and driving increased among Guam high school students between 2011 and 2013, with no change noted in subsequent years. Nearly one in fourteen students reported they drove when drinking alcohol during the 30 days before the survey (Figure 50).

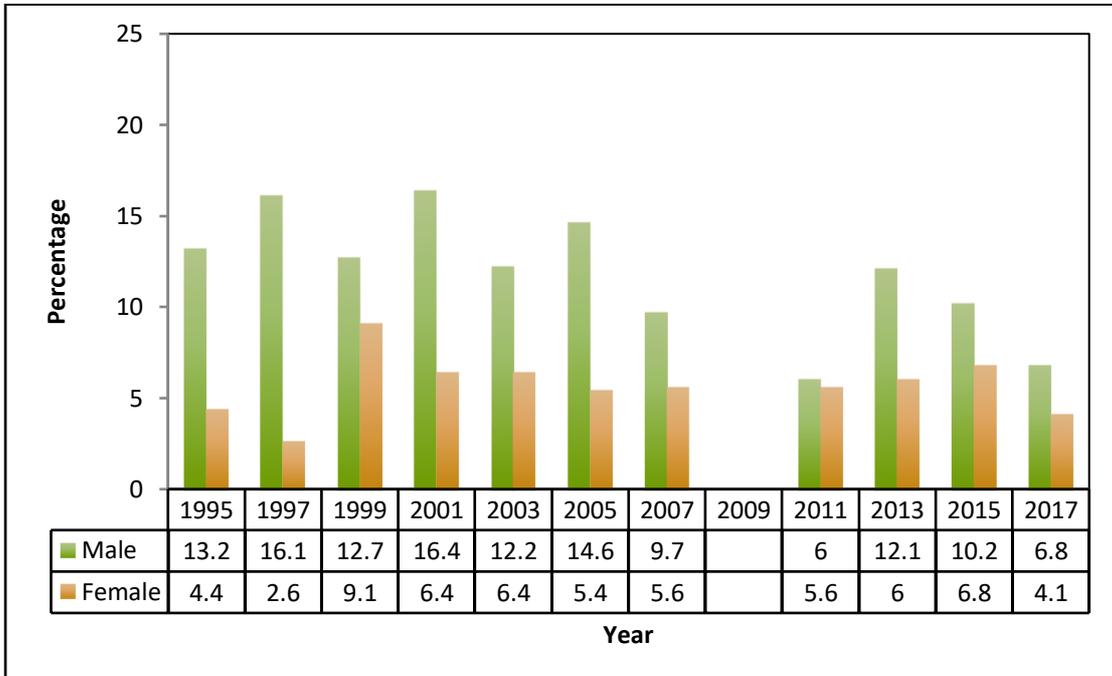
Figure 50. Drinking and driving, high school, Guam vs. US, 1995 to 2017



Source: GDOE, YRBS 1995-2017
 Note: blank cells = data not available

Males were more likely than females to drink and drive (Figure 51).

Figure 51. Drinking and driving, high school, by sex, Guam, 1995-2017

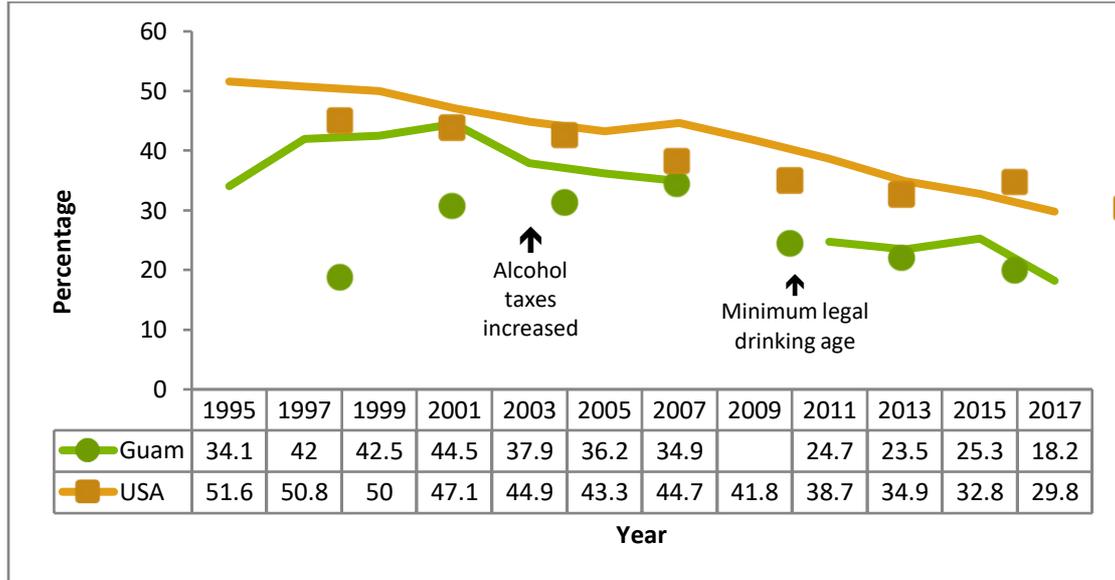


Source: GDOE, YRBS 1995-2017
 Note: blank cells = data not available

Policy impact on alcohol consumption

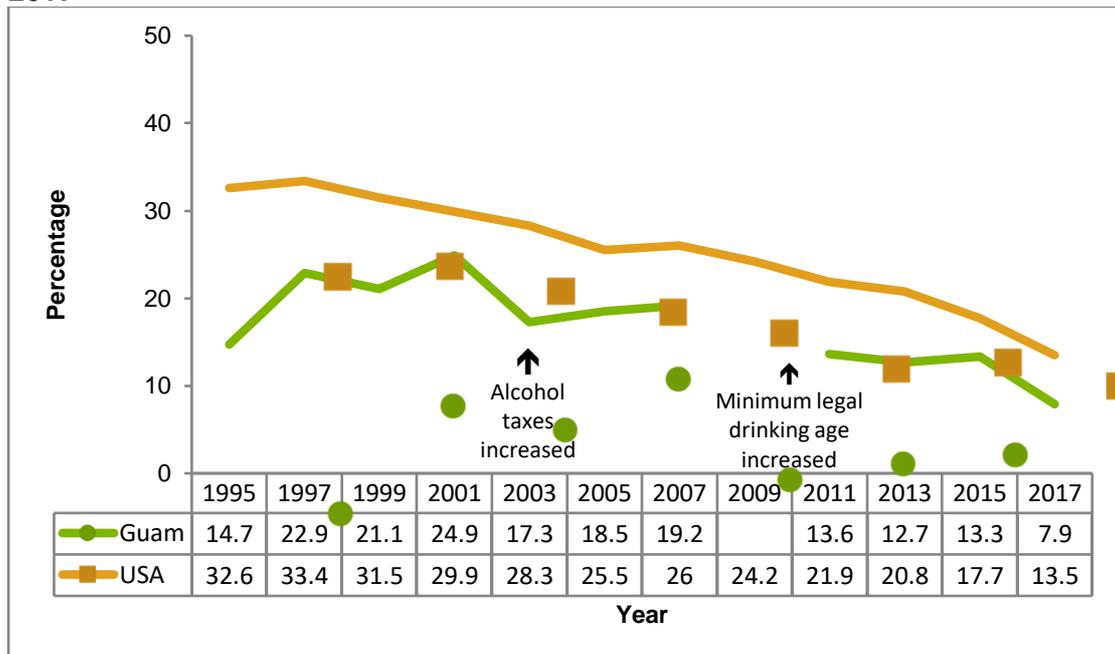
Guam raised taxes on alcohol products in 2003. In 2010, the minimum legal age for alcohol consumption was raised from 18 to 21 years. These policy milestones were accompanied or followed by significant declines in youth current alcohol use and binge drinking. Of note, the youth current alcohol use and binge drinking rates were rising steadily from 1995 to 2001; this upward trend was reversed after the increase in alcohol taxes in 2003 (Figures 52 and 53).

Figure 52. Policy impact on current alcohol use, high school, Guam vs. USA, 1995-2017



Source: GDOE, YRBS 1995-2017
 Note: blank cells = data not available

Figure 53. Policy impact on binge drinking, high school, Guam vs. USA, 1995-2017



Source: GDOE, YRBS 1995-2017; CDC, YRBS, 1995-2017
 Note: blank cells = data not available

Alcohol: Consequences

Health Consequences

Alcohol directly contributes to cancer, the 2nd leading cause of death on Guam (see Table 13). In addition, alcohol is implicated in some types of heart disease, stroke, suicide, and accidents and chronic alcoholism can worsen the prognosis of persons with pneumonia, septicemia and diseases of the digestive system (liver cirrhosis).

Alcohol is a major risk factor for liver cancer. Liver cancer has risen in rank from the 5th cause of cancer death in Guam in 2003-2007, to the 2nd in 2008-2012. Previously, liver cancer accounted for 7% of cancer deaths; however, in 2008-2012, it comprised 11% of all cancer deaths. In 2008-2012, Guam had a liver cancer incidence rate (age-adjusted rate = 16.72 per 100,000) that was more than double the US rate (7.3 per 100,000). The mortality rate from live cancer in Guam (age-adjusted rate = 13.13 per 100,000) was also more than twice the US rate (5.9 per 100,000). The liver cancer mortality rate for Micronesians in Guam was nearly 5 times higher than the US rate (Table 14).

Table 14. Top cancer cases and deaths, selected cancer sites, Guam, 2008-2012

Cancer Sites	Incidence Counts (New Cases)	Percent of Total Cancer Incidence	Cancer Sites	Mortality Counts (Death)	Percent of Total Cancer Mortality
1 Breast (Female)	292	15.3%	1 Lung and Bronchus	213	28.9%
2 Lung and Bronchus	281	14.8%	2 Liver	81	11.0%
3 Prostate	201	10.6%	3 Colon and Rectum	78	10.6%
4 Colon, Rectum & Anus	190	10.0%	4 Prostate	40	5.4%
5 Cervix	130	6.8%	5 Breast (Female)	37	5.0%
6 Liver	105	5.5%	6 Leukemia	35	4.8%
7 Thyroid	86	4.5%	7 Non-Hodgkin Lymphoma	26	3.5%
8 Uterus	70	3.7%	8 Pancreas	24	3.3%
9 Leukemia	68	3.6%	9 Stomach	21	2.9%
1 Non-Hodgkin Lymphoma	55	2.9%	1 Nasopharynx	19	2.6%
0 Other Cancer Sites	426	22.3%	0 Other Cancer Sites	162	22.0%
All New Cancer Cases	1904	100.0%	All Cancer Deaths	736	100.00%

Source: DPHSS, Cancer Facts and Figures 2008-2012

Socio-economic Consequences

Alcohol-related arrests comprised 16% of all arrests in 2017 (Table 15).

Table 15. Alcohol-related arrests, Guam, 2010 to 2017

Year	Total Offenses Cleared	DUI (Number of all arrests)	Liquor Laws (Number of all arrests)	Drunkness (Number of all arrests)	Alcohol-related arrests, (% of arrests)
2010	2157	624	61	101	36.4%
2011	2079	492	28	0	25.0%
2012	2174	463	32	0	22.8%
2013	1846	226	78	18	17.4%
2014	2036	418	78	133	30.9%
2015	3568	531	180	139	23.8%
2016	2969	286	133	133	18.6%
2017	2873	258	78	118	15.8%

Source: Guam Police Department, Uniform Crime Report, 2017; table 4-5, p. 61.

There were 125 arrests noted in the “Driving under the Influence” (DUI) special report of the 2017 UCR, down from 140 arrests from the previous year (Table 16)

[NOTE: These figures do not match with the numbers reported in other sections of the UCR].

DUI arrests were predominantly among males, those aged 25-29 years. Ninety percent of DUI arrests in 2017 were among Asian Pacific Islanders.

Table 16. Arrests for driving under the influence (DUI), Guam, 2010-2017

Year	Number of Arrests	Percent Change from Previous Year	Rate per 1,000 population
2010	695	-25.0	4.4
2011	294	-57.7	1.8
2012	278	-5.4	1.7
2013	230	-17.3	1.4
2014	427*	+85.6*	2.6*
2015	395*	+7.5*	2.4*
2016	140*	-64.5*	0.9*
2017	125	-10.7	0.8

Source: Guam Police Department, Uniform Crime Report, 2017; Table 5-4, p.72.

Note: * = revised from previous editions of the UCR

Alcohol-related offenses accounted for 35% of all juvenile arrests in 2017 (Table 17).

Table 17. Alcohol-related arrests, juvenile offenders: Guam, 2010 to 2017

Year	Total Arrests	DUI (n)	Liquor Laws (n)	Drunkenness (n)	Alcohol-related arrests, % of arrests (n)
2010	320	3	14	0	5.3 (17)
2011	246	1	5	0	2.4 (6)
2012	700	2	47	1	7.4 (50)
2013	550	4	35	2	7.4 (41)
2014	656	1	87	0	13.4 (88)
2015	774	1	94	0	12.3 (95)
2016	410	1	46	1	11.7 (48)
2017	352	5	122	0	35.1 (127)

Source: Guam Police Department, Uniform Crime Report, 2017; Bureau of Statistics and Plans, 2017 Guam Statistical Yearbook, 2018

Alcohol use has been implicated in property crime and violent crime including family violence and suicide. Violent crime decreased from 2015 to 2017, while property crimes remained unchanged (Table 18).

Table 18. Change in violent and property crimes, cleared offenses, Guam, 2013 to 2017

Year	Violent Crime, number of cases	Rate per 1,000 population	Property crime, number of cases	Rate per 1,000 population
2013	660*	4.1	4532	28.3
2014	547*	3.4	3873	24.0
2015	690	4.2	3696	23.0
2016	341*	2.1	3741	23.0
2017	369	2.2	3656	22.3

Source: Guam Police Department, Uniform Crime Report, 2017, table 2-1, p.6. and table 2-24, p. 26.

Note: * - revised from previous editions of the UCR

The Guam Police Department reported 24 traffic fatalities in 2017. Alcohol was a factor in 17% of all traffic-related deaths (Table 19).

Table 19. Traffic fatalities and alcohol-related fatalities, Guam, 2010-2017

Year	Traffic Accidents	DUI Arrests	Traffic fatalities (n)	Alcohol-related traffic fatalities (n)	Alcohol-related fatalities (%)
2010	7,165	681	21	6	28.6
2011	6,705	429	18	5	27.8
2012	6,604	442	13	9	69.2
2013	6,653	350	19	6	31.6
2014	6,477	292	19	7	36.8
2015	7,204	531	9	2	22.2
2016	7,566	333	12	2	16.7
2017	7,567	419*	24	4	16.7

Source: Guam Police Department, as reported in the Guam Statistical Yearbook 2017; Bureau of Statistics and Plans, 2017 Guam Statistical Yearbook, 2018

Note: * - number does not match other sections of the UCR

Environmental Consequences

Beverage cans, beverage bottles (glass) and beverage caps made up 3 of the top 10 types of debris found on land and in the water. Beverage cans comprised 24% of environmental debris, glass beverage bottles made up 7% and beverage caps another 4%.

MARIJUANA

Consumption: Adults

TREND AND PREVALENCE

Data on marijuana use in Guam are available for the years 2011-2013, and 2016.

Participants who responded affirmatively to questions on either lifetime marijuana use (2011) or age at first use (2012, 2013) were asked about marijuana use in the past 30 days. Seventeen percent of ever-users of marijuana in 2011, and about 13% of those who reported age at first use in 2012 and 2013 admitted to having used marijuana within the past 30 days before the survey. We calculated the crude population prevalence of current marijuana use from the raw data; in 2013, about 4% of the adult population in Guam were current users of marijuana.

In 2016, CDC introduced an optional marijuana use module, which queried survey participants directly about 30-day past use. About 12% of adults admitted to using marijuana on one or more of the past 30 days. 3.7% of respondents reported using marijuana daily.

CORRELATES OF MARIJUANA USE

Sex

Men were twice more likely than women to have used marijuana recently. In 2016, 15% of adult men and 7% of adult women admitted to marijuana use within the past 30 days (Figure 54).

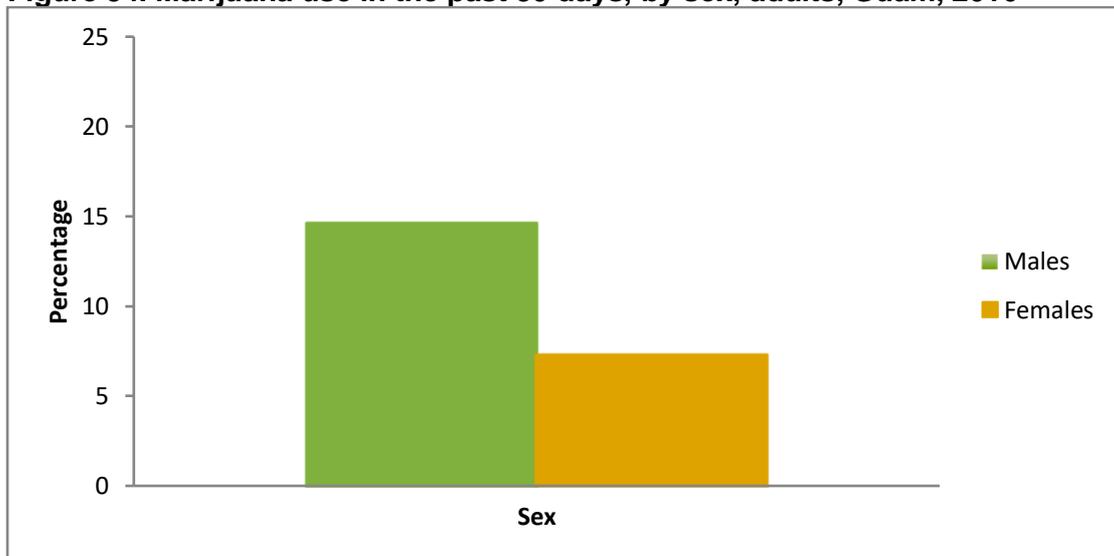
Education

Adults with some post high school education reported the highest rates of 30-day marijuana use.

Ethnicity

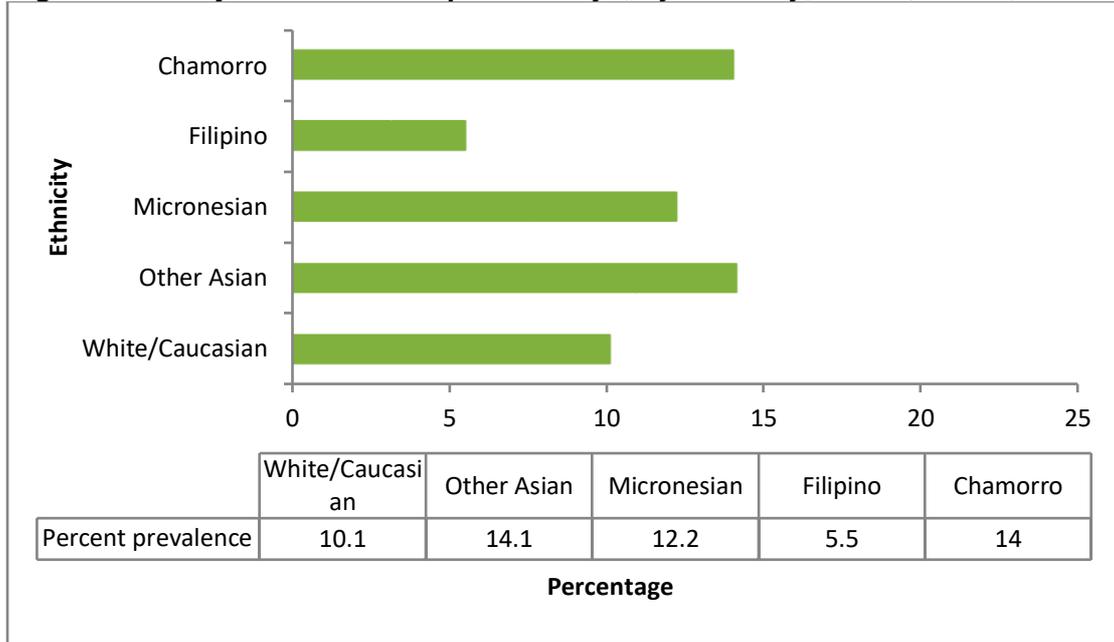
CHamorus and Asians except Filipinos had the highest rates of use in the past 30 days. Filipinos had the lowest (Figure 55).

Figure 54. Marijuana use in the past 30 days, by sex, adults, Guam, 2016



Source: DPHSS, BRFSS 2016

Figure 55. Marijuana use in the past 30 days, by ethnicity, adults, Guam, 2016



Source: DPHSS, BRFSS 2016: Note: the BRFSS still uses the old spelling “Chamorro”

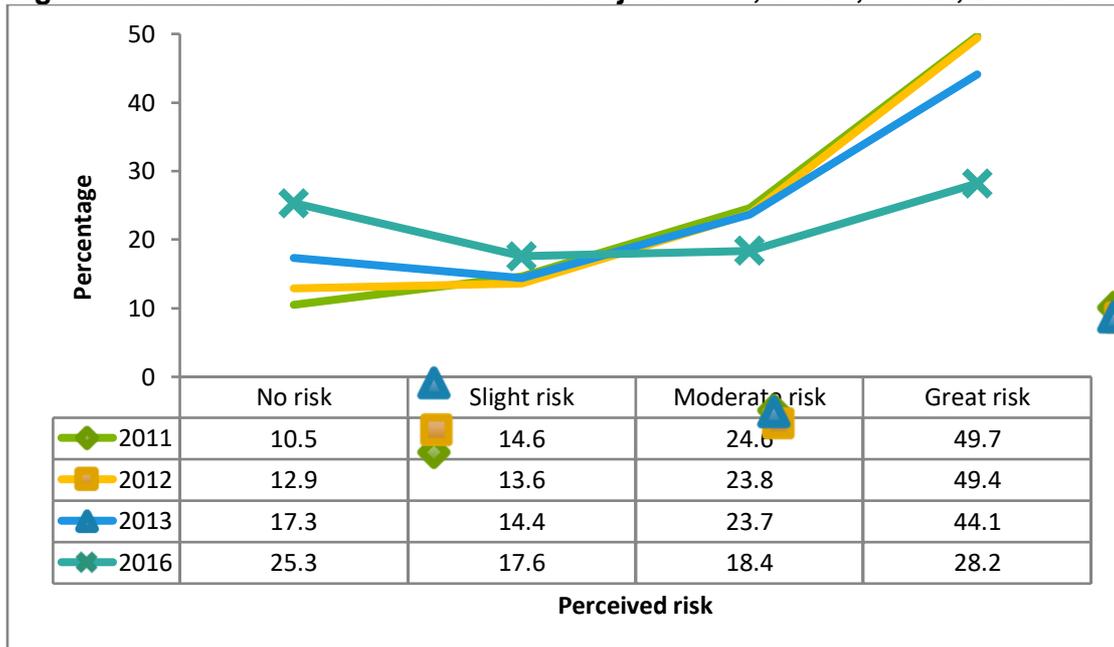
Age at Initiation

Almost 22% of current users reported first using marijuana between the ages of 13 to 17 years. Another 4% stated they first used marijuana at the age of 12 years or younger. Altogether, one-fourth (26%) of current users started using marijuana before the age of 18 years.

Perceived Risk of Harm

The perceived risk of harm from marijuana has decreased significantly over the past years. In 2016, 25% of adults thought that there was no risk associated with marijuana use, compared to 10% in 2011 (Figure 56). In contrast, 28% believed there was great risk, compared to almost 50% in 2011.

Figure 56. Perceived risk of harm from marijuana use, adults, Guam, 2011-2016



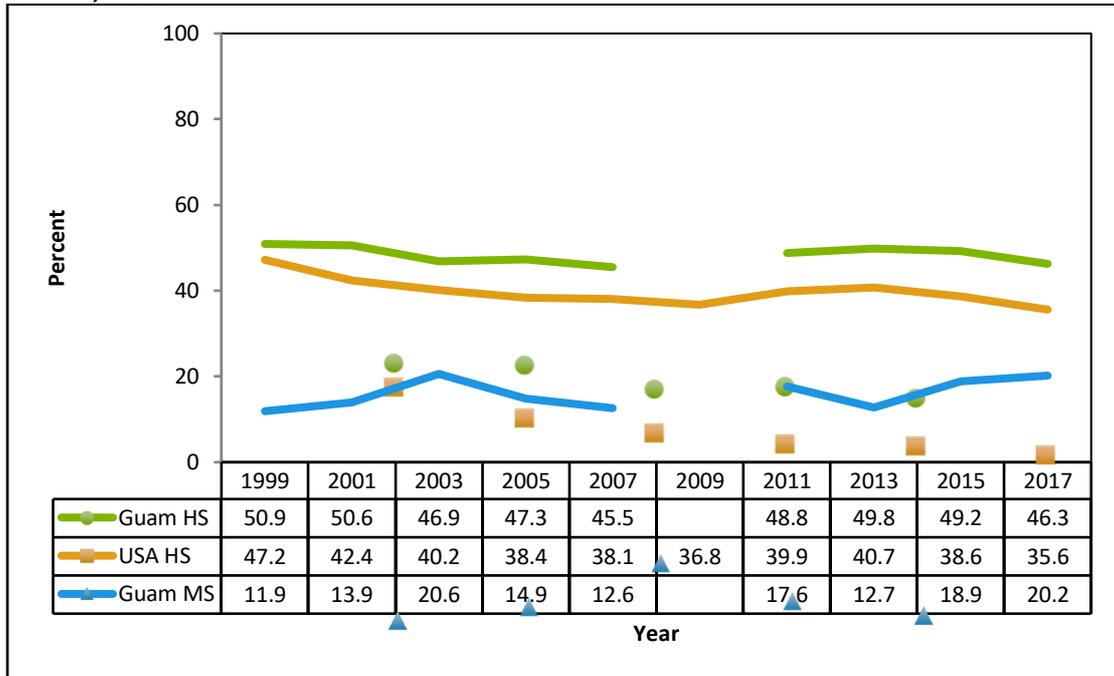
Source: DPHSS, BRFSS 2011-2013; BRFSS 2016

Consumption: Youth

TREND AND PREVALENCE

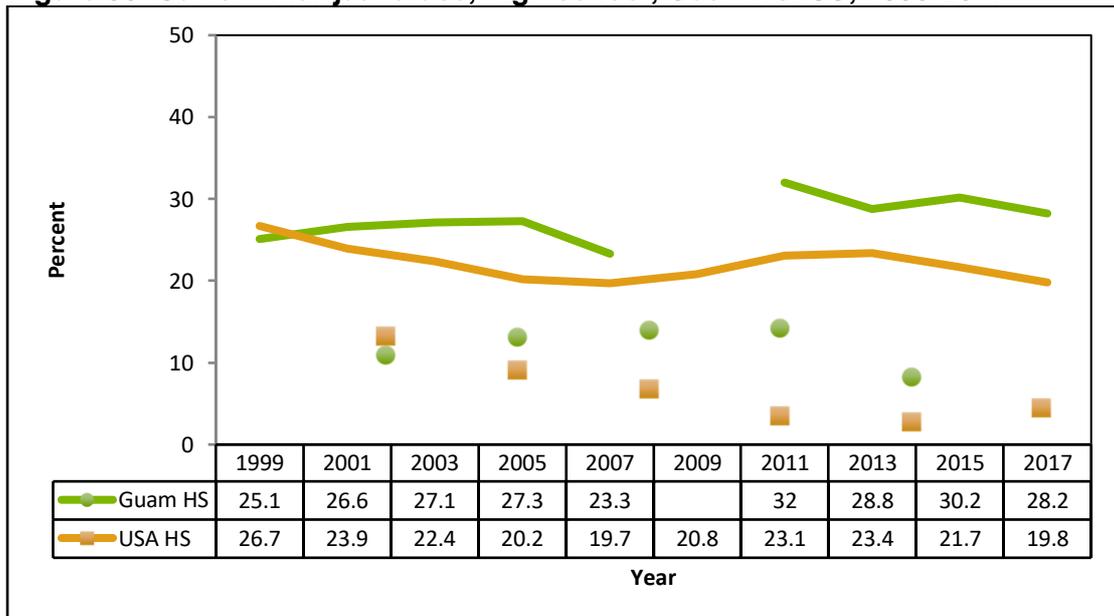
Nearly half of all high school students had tried marijuana, and nearly one-third had used marijuana within 30 days of the survey. Among middle school students, 1 in 5 (20%) had tried marijuana at least once. Current and lifetime marijuana use among high school students in Guam remained higher than in the US (Figures 57 and 58).

Figure 57. Lifetime marijuana use, high school, Guam vs. US, and middle school, Guam, 1999-2017



Source: GDOE, YRBS 1999-2017; CDC, YRBS 1999-2017
 Note: blank cells = data not available

Figure 58. Current marijuana use, high school, Guam vs. US, 1999-2017



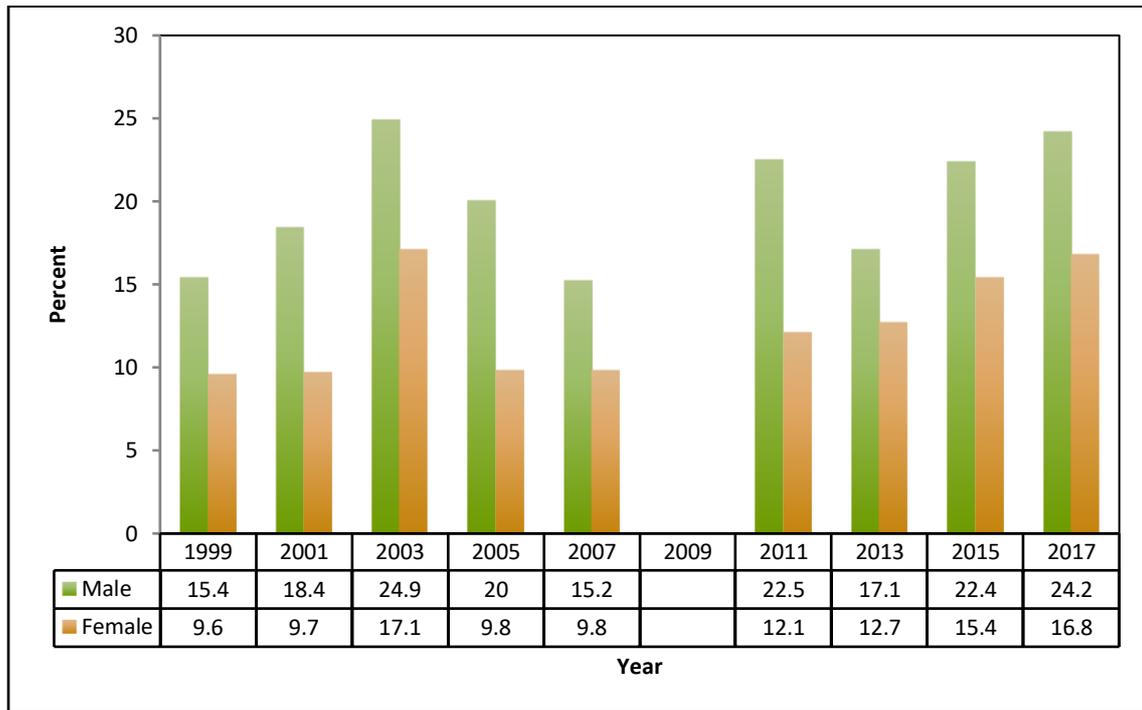
Source: GDOE, YRBS 1999-2017
 Note: blank cells = data not available

CORRELATES OF MARIJUANA USE

Sex

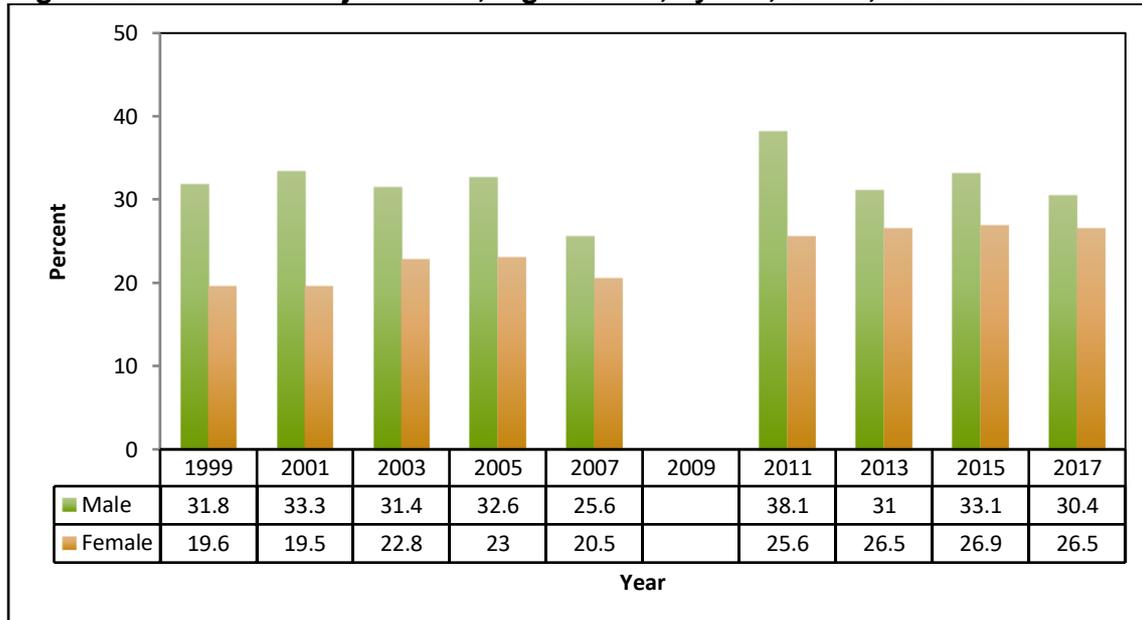
Male students were more likely to report marijuana use (Figures 59 and 60). However, lifetime use among middle school females and current use among high school females are significant, and the gender gap is narrowing.

Figure 59. Lifetime marijuana use, middle school, by sex, Guam, 1999 to 2017



Source: GDOE, YRBS 1999-2017
 Note: blank cells = data not available

Figure 60. Current marijuana use, high school, by sex, Guam, 1999 to 2017

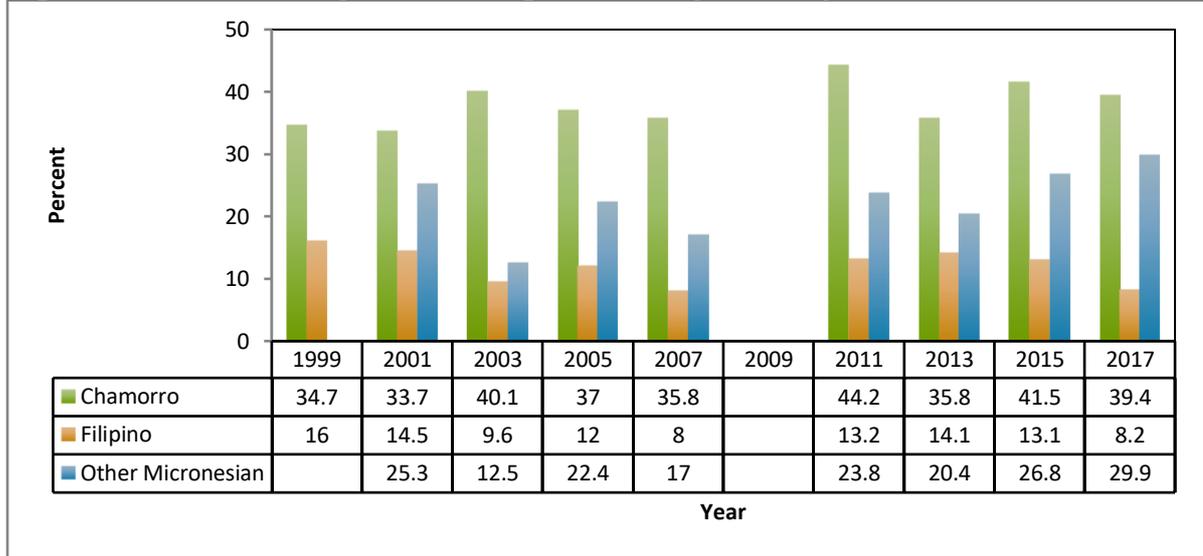


Source: GDOE, YRBS 1999-2017
 Note: blank cells = data not available

Ethnicity

Marijuana use is highest among CHamoru youth and lowest for Filipino youth. CHamoru youth are more than thrice as likely to use marijuana than Filipinos, and 40% more likely to use marijuana than other Micronesian youth (Figure 61). Current use declined in 2017 for Filipinos.

Figure 61. Current marijuana use, high school, by ethnicity, Guam, 1999-2017

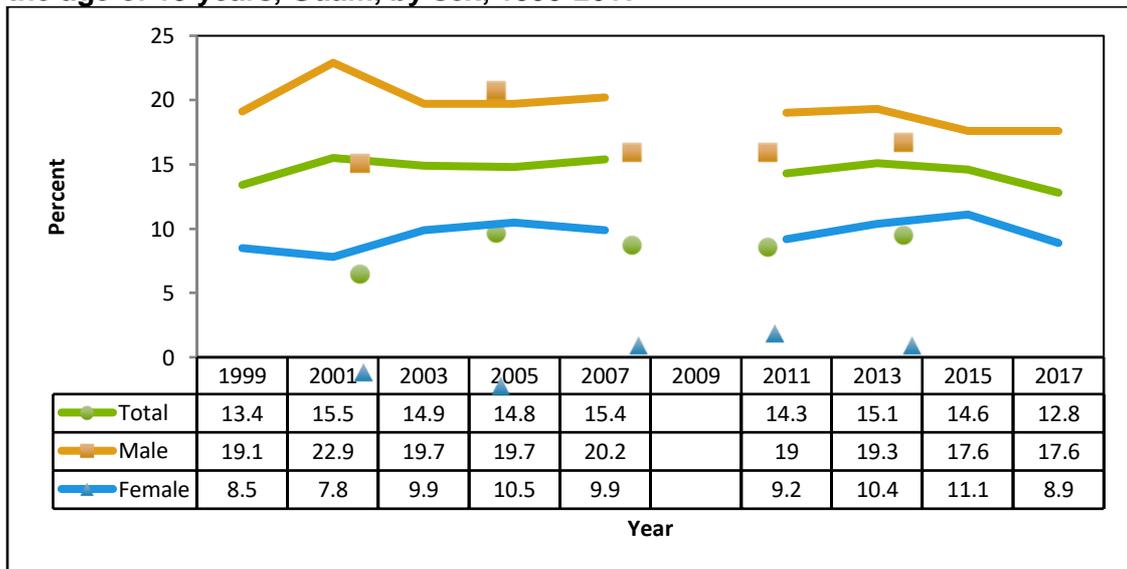


Source: GDOE, YRBS 1999-2017; Note: blank cells = data not available; the YRBS still uses the old spelling "Chamorro"

Age at Initiation

The proportion of high school youth who started using marijuana before the age of 13 years, was 13%. Males were more likely than females to report age at 1st use before 13 years (Figure 62). Among middle school youth, nearly 7% reported trying marijuana before the age of 11 years.

Figure 62. Percent of high school youth reporting 1st use of marijuana before the age of 13 years, Guam, by sex, 1999-2017



Source: GDOE, YRBS 1999-2017; Note: blank cells = data not available

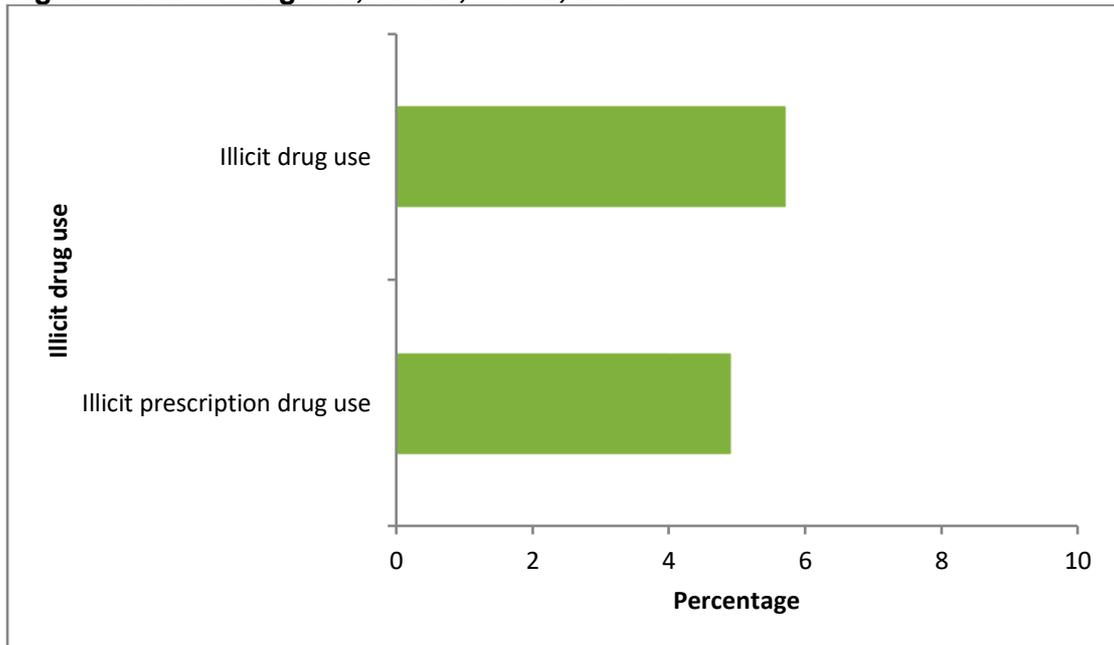
OTHER ILLICIT DRUGS

Consumption: Adults

TREND AND PREVALENCE

Guam started asking about marijuana and other illicit drug use in its BRFSS since 2011. In 2016, 5.7% of adults reported illicit drug use other than marijuana. (Figure 63). In 2016, a question on prescription drug abuse was added to the Guam BRFSS as a State-added question. About 5% of adults reported taking prescription drugs that were not prescribed for them.

Figure 63. Illicit drug use, adults, Guam, 2016



Source: DPHSS, BRFSS 2016

CORRELATES OF ILLICIT DRUG USE

Because of the small numbers of adults reporting illicit drug use, it is difficult to state with accuracy if true differences exist across demographic categories.

Age at initiation

In 2016, about 11% of adults who have used illicit drugs started before the age of 21 years.

Working for employers who conduct random employee drug testing

In 2016, 51% of adults were more likely to work for employers who conduct random drug or alcohol testing on its employees, while 12% were less likely to do so.

CORRELATES OF ILLICIT PRESCRIPTION DRUG USE

Perception of risk

65% of adults believed there is great risk in using prescription drugs improperly, while 8% believed there was no risk. Higher educational attainment and income were associated with greater perceived risk. 20% of Micronesians perceived there to be no risk, compared to 9% of Filipinos, 7% of CHamorus and 2% of Caucasians.

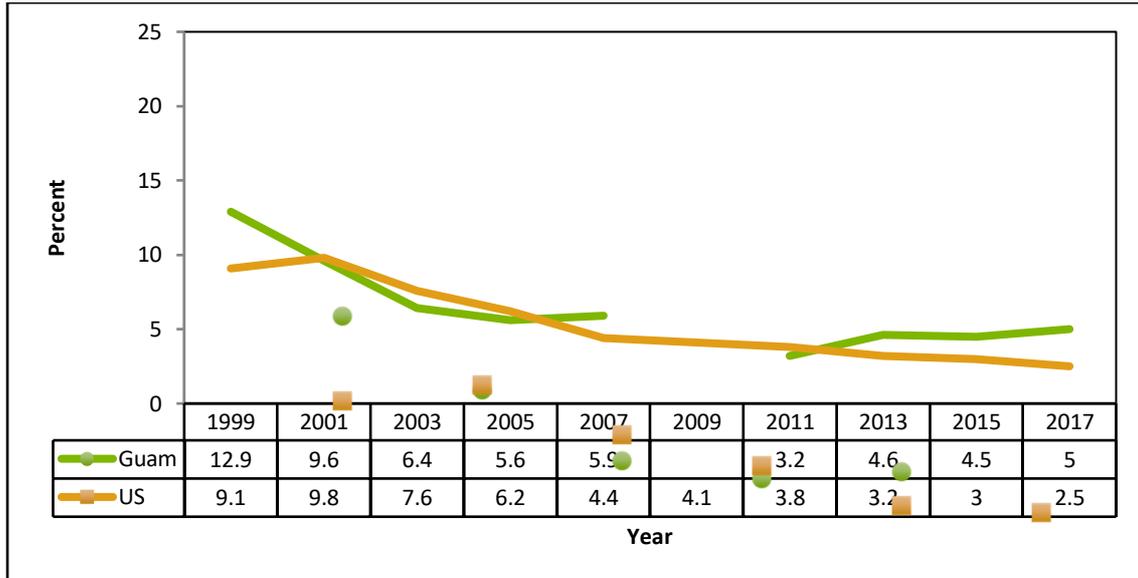
Consumption: Youth

Methamphetamine

TREND AND PREVALENCE

Lifetime prevalence among Guam youth paralleled the decrease in lifetime use among US youth from 2001 to 2011; however, lifetime use increased for Guam in 2013, with no change in 2015 and 2017, while the US rate continued to decrease (Figure 64). Five percent of Guam high school students reported ever using methamphetamines.

Figure 64. Lifetime methamphetamine use, high school, Guam vs. US, 1999-2017



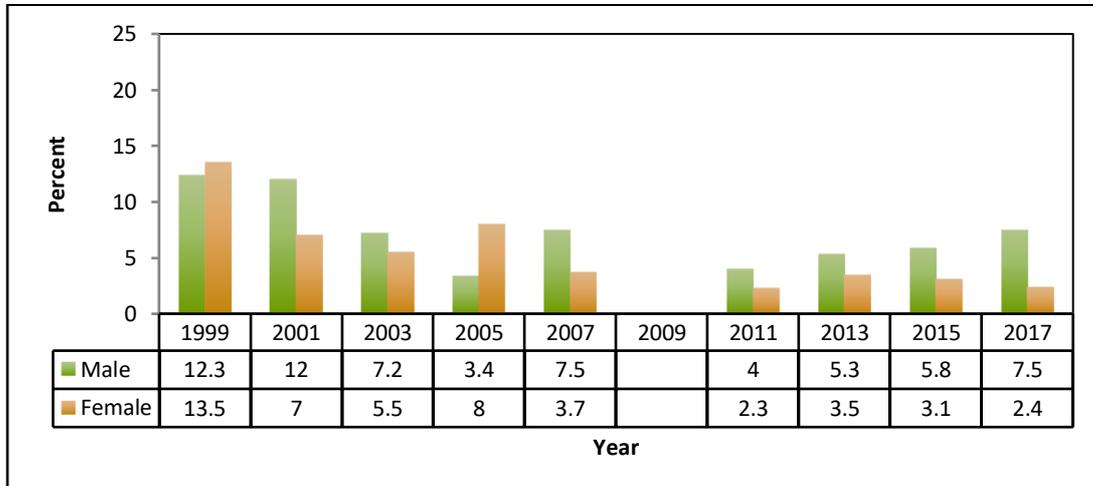
Source: GDOE, YRBS 1999-2017; Note: blank cells = data not available

CORRELATES OF METHAMPHETAMINE USE

Sex

Male students are more likely to report ever using methamphetamines than females (Figure 65).

Figure 65. Lifetime methamphetamine use, high school, by sex, Guam vs. US, 1999-2017

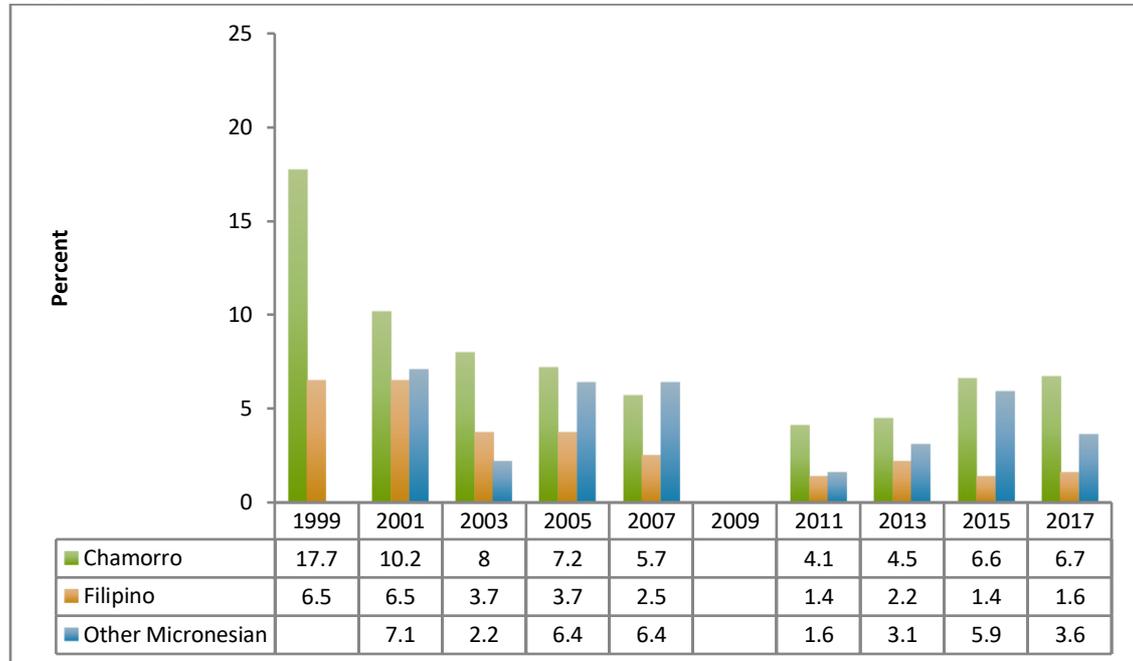


Source: GDOE, YRBS 1999-2017; Note: blank cells = data not available

Ethnicity

CHamoru youth have the highest rate of lifetime methamphetamine use, while Filipino youth have the lowest. Methamphetamine use appears to have increased for CHamoru and other Micronesian youth in 2015 (Figure 66).

Figure 66. Lifetime methamphetamine use, high school, by ethnicity, Guam, 1999-2015



Source: GDOE, YRBS 1999-2017

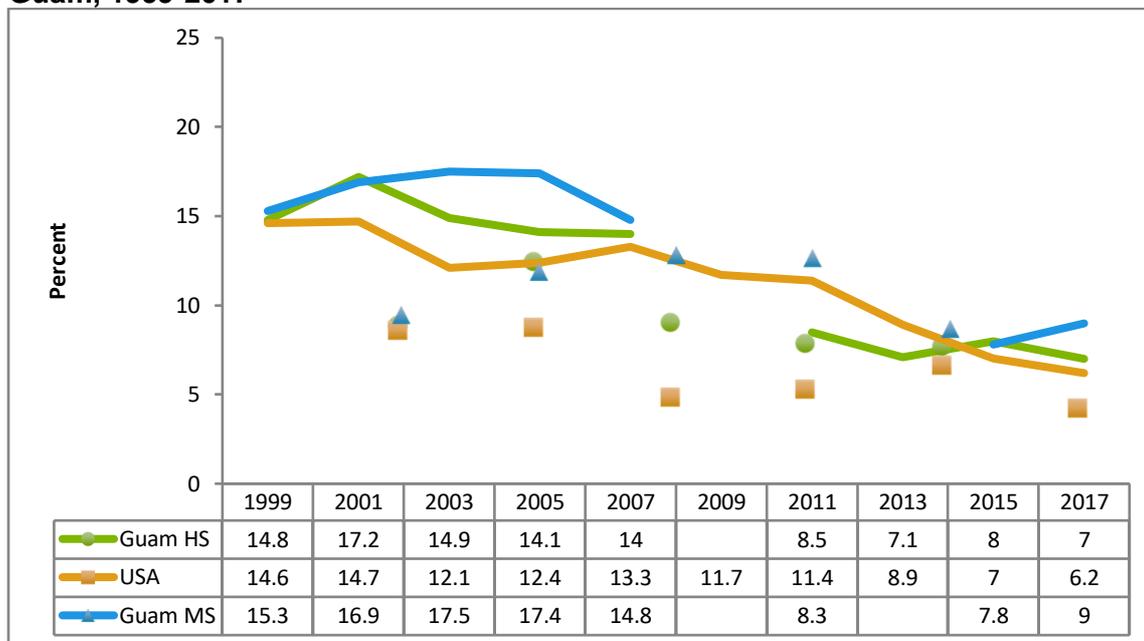
Note: blank cells = data not available; the YRBS still uses the old spelling "Chamorro"

Inhalants

TREND AND PREVALENCE

Inhalant use appeared unchanged over time for US and Guam high school youth, and Guam middle school youth (Figure 67). In 2017, 7% of Guam high school and 9% of middle school students reported having tried inhalants.

Figure 67. Lifetime inhalant use, high school, Guam vs. US, and middle school, Guam, 1999-2017



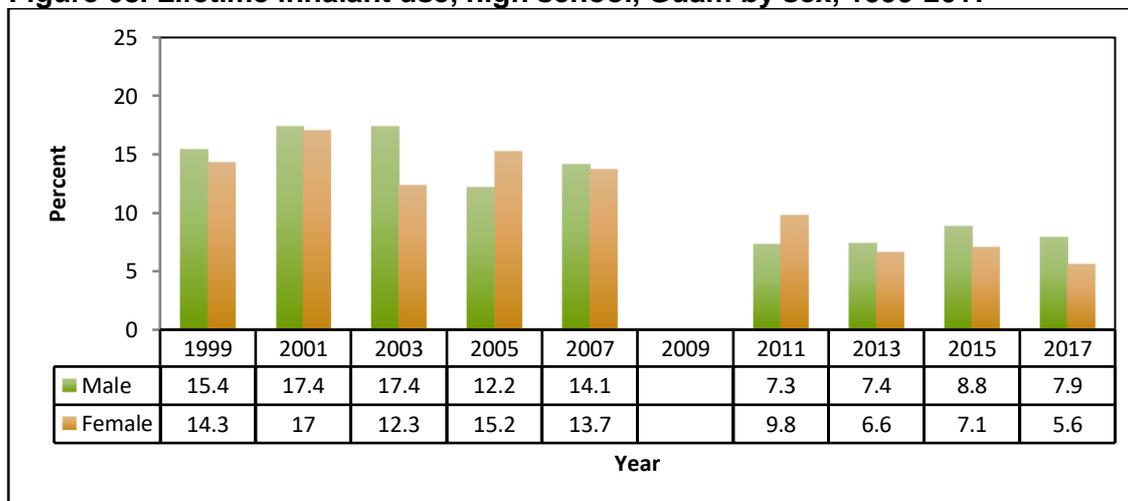
Source: GDOE, YRBS 1999-2017; Note: blank cells = data not available

CORRELATES OF INHALANT USE

Sex

There were no obvious sex differences in lifetime inhalant use among Guam youth, although the overall numbers are small, and caution is needed in interpreting the data (Figure 68).

Figure 68. Lifetime inhalant use, high school, Guam by sex, 1999-2017

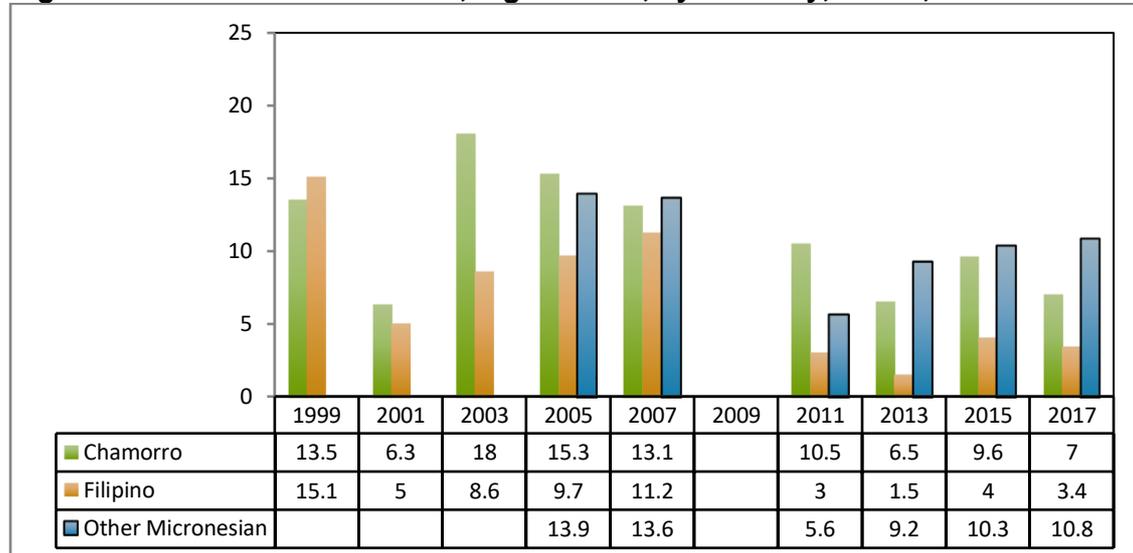


Source: GDOE, YRBS 1999-2017
Note: blank cells = data not available

Ethnicity

CHamorus and other Micronesians had higher reported lifetime inhalant use; among high school students, Filipinos had the lowest prevalence (Figure 69). The numbers of students under some of these categories are small, so caution is needed in interpreting the data.

Figure 69. Lifetime inhalant use, high school, by ethnicity, Guam, 1999-2017



Source: GDOE, YRBS 1999-2017

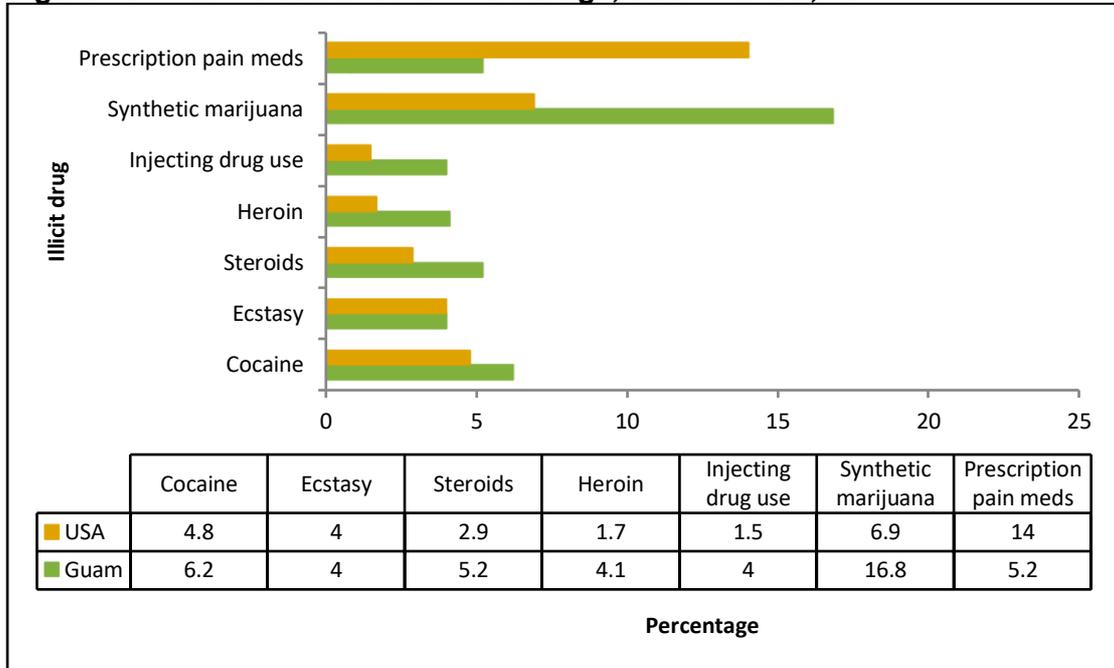
Note: blank cells = data not available; the YRBS still uses the old spelling "Chamorro"

Other Illicit Drugs

PREVALENCE

Guam high school students reported higher rates of lifetime use of synthetic marijuana, steroids, heroin, and injecting drug use than their US counterparts (Figure 70). US youth reported a higher rate of prescription medicine abuse. The overall Guam numbers are small, and caution is needed in interpreting the data.

Figure 70. Lifetime use of other illicit drugs, Guam vs. US, 2017



Source: GDOE, YRBS 2017; CDC, YRBS 2017

Prescription Drug Abuse

PREVALENCE

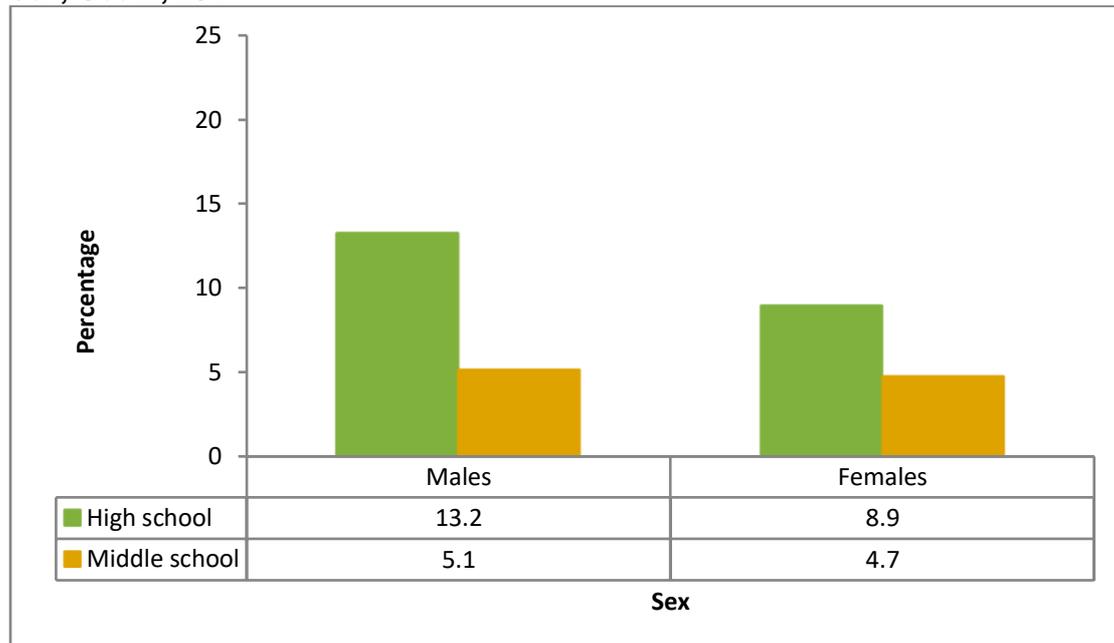
In 2017, 14% of high school students and 5% of middle school students reported taking a prescription drug, such as OxyContin, Percocet, Vicodin, codeine, Adderall, Ritalin or Xanax, without a doctor’s prescription.

CORRELATES OF PRESCRIPTION DRUG ABUSE

Sex

Among high school students, males were more likely to report prescription drug misuse. No statistically significant difference across the sexes were noted for middle school students (Figure 71). Because the numbers are small, caution is needed in interpreting the data.

Figure 71. Lifetime prescription drug abuse, high school vs. middle school by sex, Guam, 2017

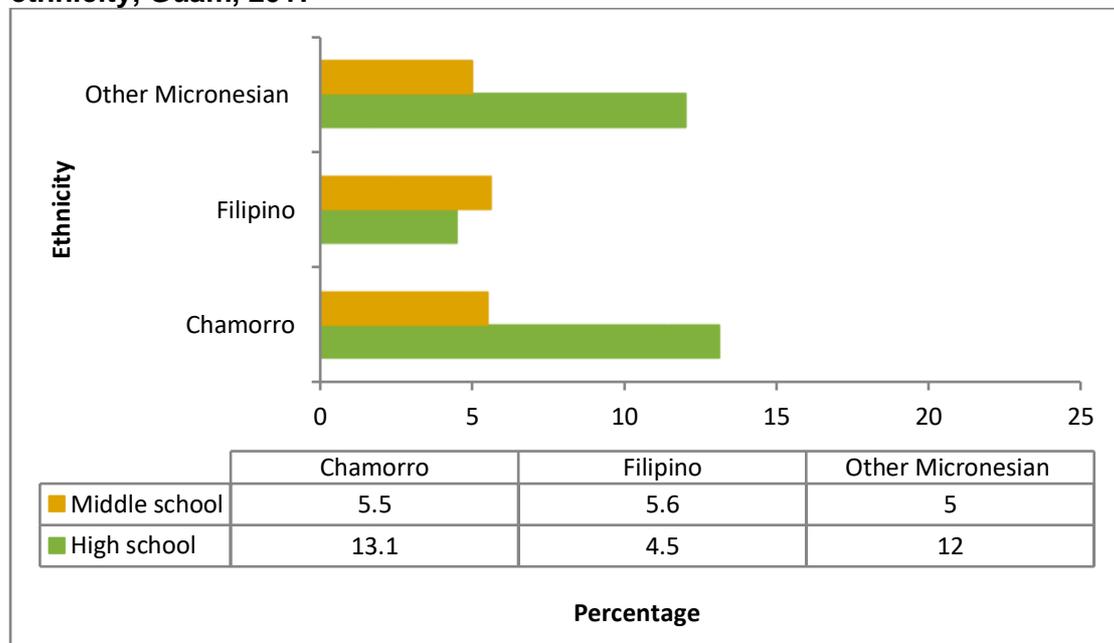


Source: GDOE, YRBS 2017

Ethnicity

For high school students, CHamorus had higher rates of prescription drug abuse than Filipinos and other Micronesians (Figure 72). For middle school students, no difference across the racial categories was noted.

Figure 72. Lifetime prescription drug abuse, high school vs. middle school, by ethnicity, Guam, 2017



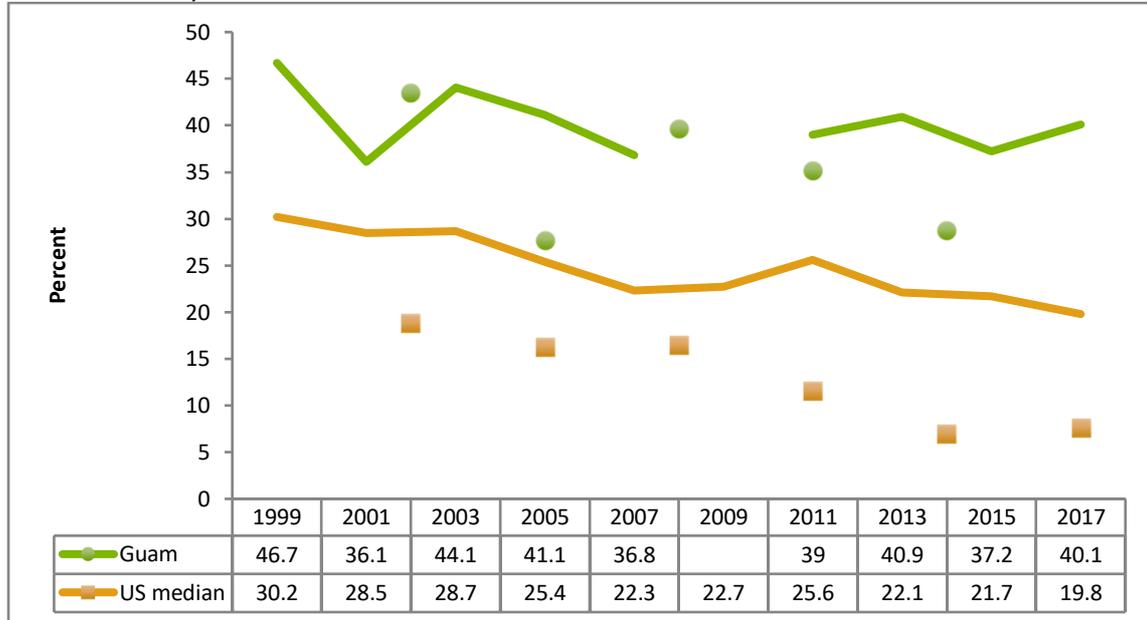
Source: GDOE, YRBS 2017

Note: The YRBS still uses the old spelling “Chamorro”

Drug Use on School Property

In 2017, 40% of high school youth reported they had been offered, sold or given an illegal drug by someone on school property. The likelihood of this happening is significantly higher in Guam than in the US (Figure 73), and highlights school campuses as a critical drug enforcement setting.

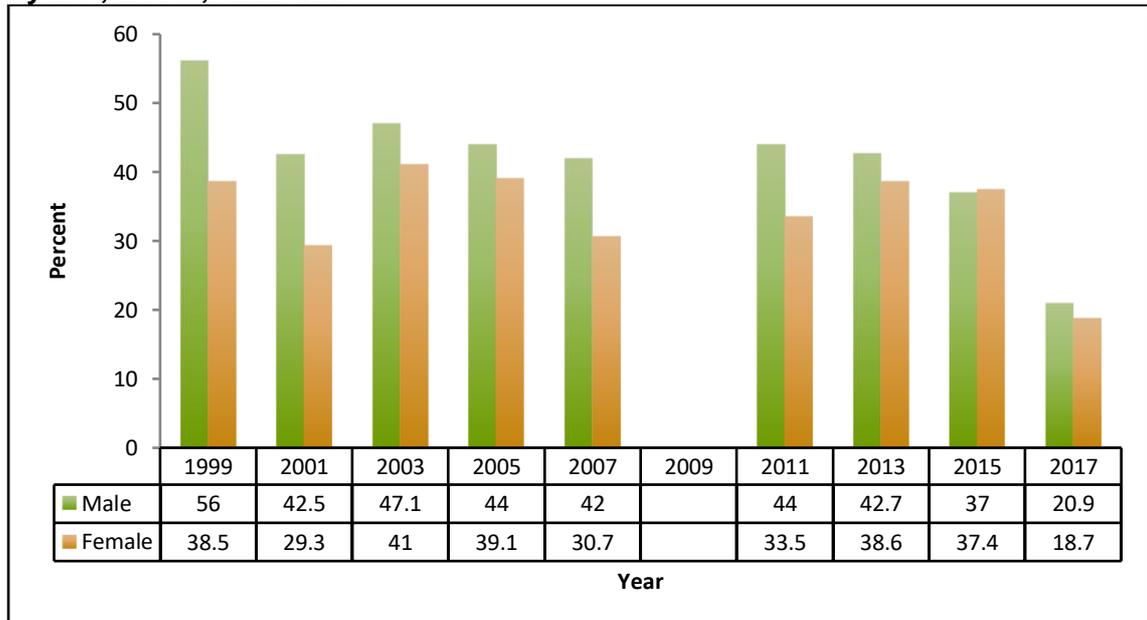
Figure 73. Offered, sold or given an illegal drug on school property, high school, Guam vs. US, 1999-2017



Source: GDOE, YRBS 1999-2017
 Note: blank cells = data not available

Males are as likely to have an illegal drug offered or sold to them on school property as females (Figure 74).

Figure 74. Offered, sold or given an illegal drug on school property, high school, by sex, Guam, 1999-2017

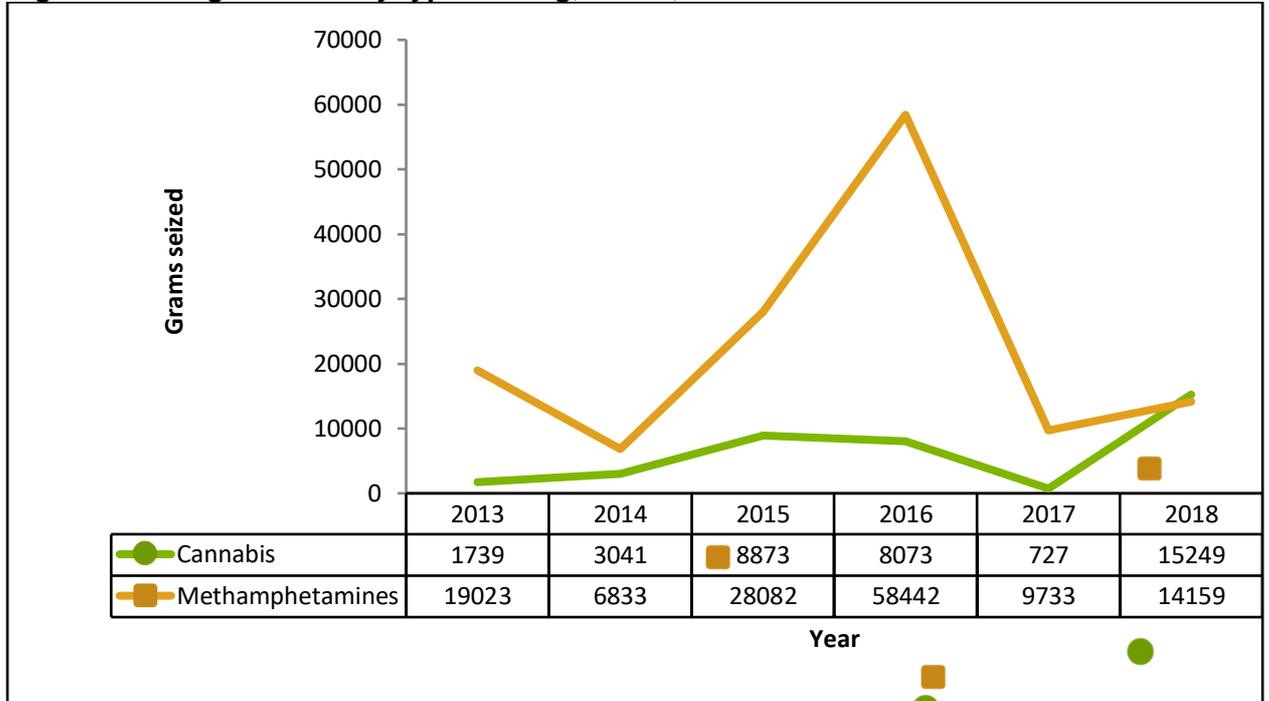


Source: GDOE, YRBS 1999-2017
 Note: blank cells = data not available

Corollary data on drug consumption

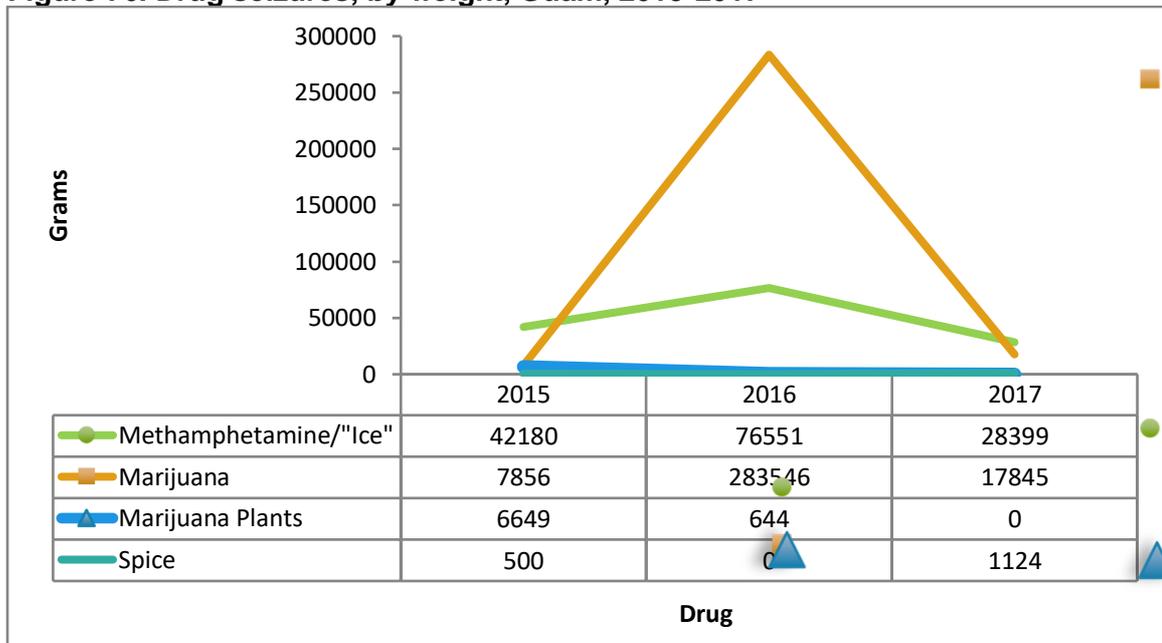
Corollary data on drug seizures are available for 2013 to 2018 from the Guam Customs and Quarantine Agency, and 2015-2017 from the Guam Multi-jurisdictional Task Force as reported by the Bureau of Statistics and Plans. Drug seizures most frequently involved cannabis (marijuana) and methamphetamines (Figures 75 and 76).

Figure 75. Drug seizures by type of drug, Guam, 2013-2018



Source: Guam Customs and Quarantine Agency, Citizen Centric Report 2018, June 2019

Figure 76. Drug seizures, by weight, Guam, 2015-2017



Source: Bureau of Statistics and Plans, A report to our citizens in FY 2017, Aug 2018

Consequences

Data on violent and property crime were discussed under the section on consequences of alcohol use. Arrests for drug-related offenses decreased in 2017 by 53% from 2016 (Table 20). The rate for drug-related arrests decreased from 3.0 per 1,000 people in 2016 to 1.5 per 1,000 people in 2017.

Table 20. Number of drug-related arrests per year: Guam, 2010 to 2017

	2010	2011	2012	2013	2014	2015	2016	2017
Number of cases	130	221	293	271	369	477	494	230
Percent change from previous year	-17.2	70	32.6	-7.5	36.2	29.3	3.5	-53.4
Rate per 1,000 population	1.0	1.4	1.8	1.7	2.3	3.0	3.0	1.5

Source: Guam Police Department, 2017 Uniform Crime Report, 2018, table 5-7, p.76

Of persons arrested for drug abuse violations in 2017, 5% were under the age of 18 years, and 79% were males. Majority (74%) were arrested for possession of an illegal substance. No data on drug type was provided in the 2015 UCR.

The Judiciary of Guam reported that possession of a Schedule II controlled substance and driving while impaired were the first and third most common types of offense charged. Driving while impaired and driving while under the influence of alcohol comprised the 2nd and 4th top misdemeanors charged, while possession of a Schedule II controlled substance was the first of the top felonies charged for that year (Source: Judiciary of Guam, Fiscal Year 2018- A Citizen-centric report, 2019).

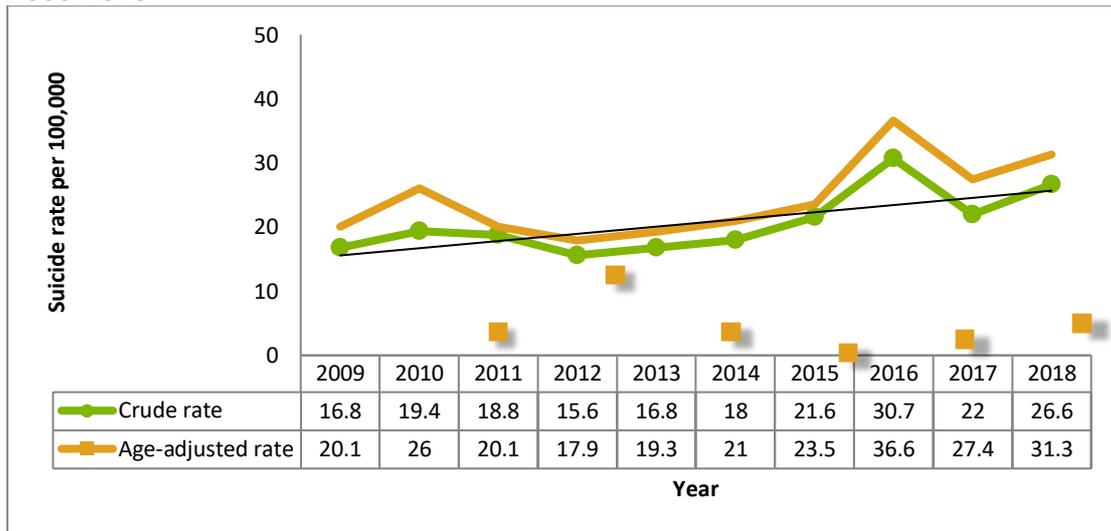
SUICIDE

MORTALITY

TREND and PREVALENCE

In 2018, there were 44 suicide deaths in Guam, resulting in a crude suicide rate of 26.6 per 100,000. Age-adjustment to the US standard population raised the suicide rate to 31.3 per 100,000. This represents an increase from 2017 (Figure 77).

Figure 77. Annual trend in suicide death rates, Guam, crude and age-adjusted, 2009-2018



Source: Calculated based on data taken from the Office of the Chief Medical Examiner, DPHSS Office of Vital Statistics and Bureau of Statistics and Plans, 2009-2018

Guam’s suicide mortality remains significantly higher than the US (Table 1). In 2018, the age-adjusted rate for Guam was over twice that of the USA.

Table 21. Age adjusted suicide death rate, Guam vs. US, 2018

	Guam 2018	US 2018
Deaths (number)	44	48,344
Crude suicide death rate per 100,000	26.6	14.2
Age-adjusted suicide death rate per 100,000*	31.3	14.2

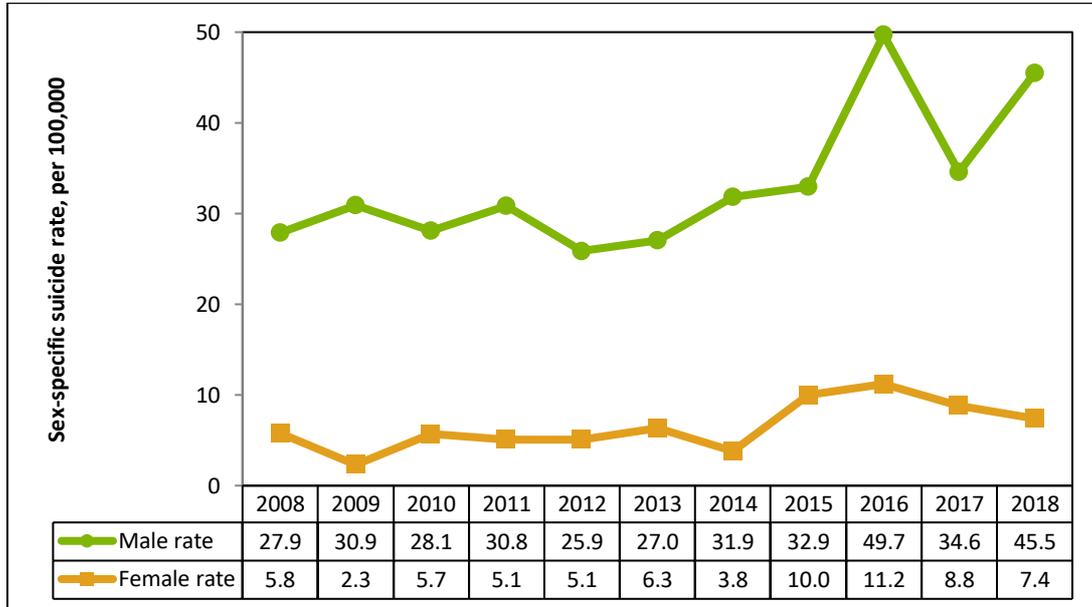
Source: Guam rates calculated based on data taken from the Office of the Chief Medical Examiner, DPHSS Office of Vital Statistics and Bureau of Statistics and Plans; US statistics from US Centers for Disease Control and Prevention (CDC), **Data & Statistics Fatal Injury Report for 201**, as reported in <https://afsp.org/about-suicide/suicide-statistics/>

CORRELATES OF SUICIDE MORTALITY

Sex

Suicide deaths in Guam occur predominantly among males, who consistently outnumber suicide deaths among females. In 2018, the ratio of the male suicide rate to the female rate was 6:1 (Figure 78), higher than the US ratio of 3.5:1. The Guam male suicide rate increased markedly in 2018 from 2017, widening the sex gap.

Figure 78. Suicide death rate by sex, Guam, 2008-2018



Sources: Calculated from data provided by the Office of the Chief Medical Examiner and Bureau of Statistics and Plans, 2008-2018

Age

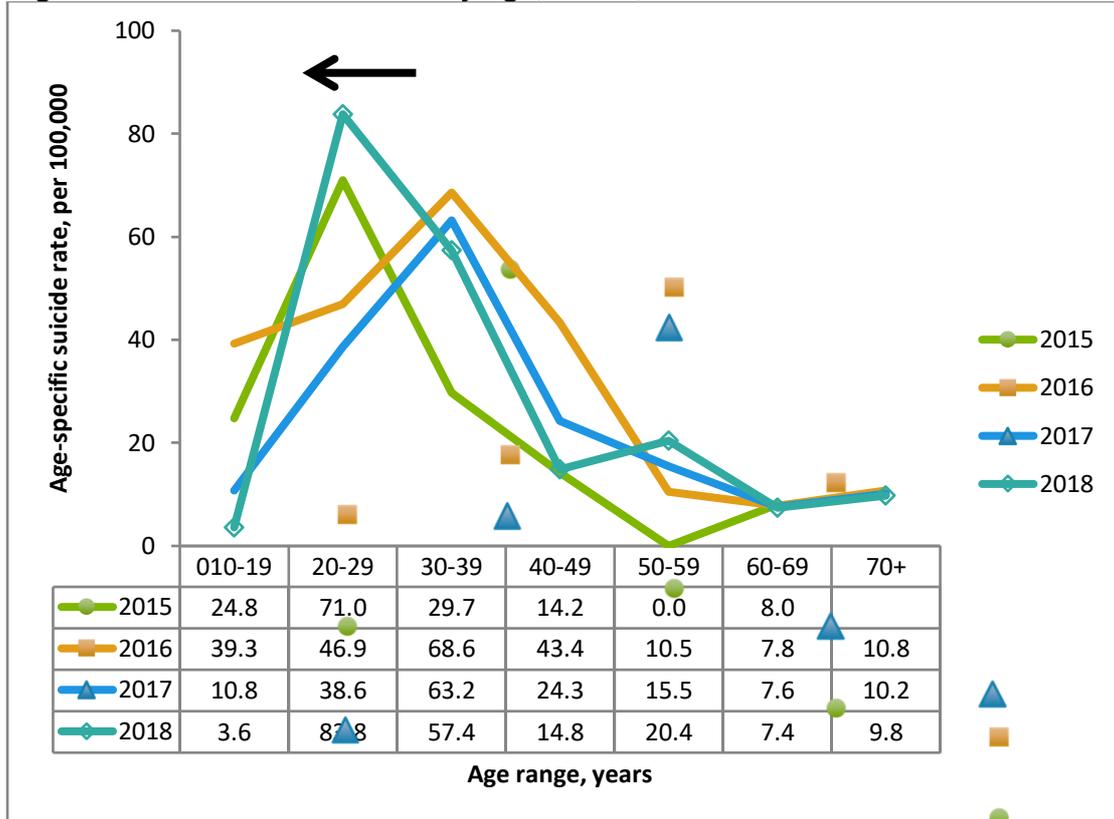
The epidemiologic pattern is changing in the US, with suicide highest among adults aged 45-54 years, and those 85 and over. Younger groups have had consistently lower suicide rates than middle-aged and older adults.¹

In Guam, when suicide deaths are disaggregated by age, the majority is seen to occur in young adults and youth. In 2016 and 2017, the peak rate shifted from those aged 20-29 to those aged 30-39 years; however, in 2018, the highest rate shifted back to those aged 20-29 years (Figure 79). The age range for suicide deaths in 2018 ranged from 17 to 80 years, with a mean age of 33.5 years and a mode of 23 years.

Collectively, about 52% of all suicide deaths in Guam from the past 10 years (2009-2018) occurred in those younger than 30 years, and 23% happened among those aged 30-39 years (Figure 80). Thus, deaths by suicide in Guam occur predominantly among young people, unlike in the US mainland.

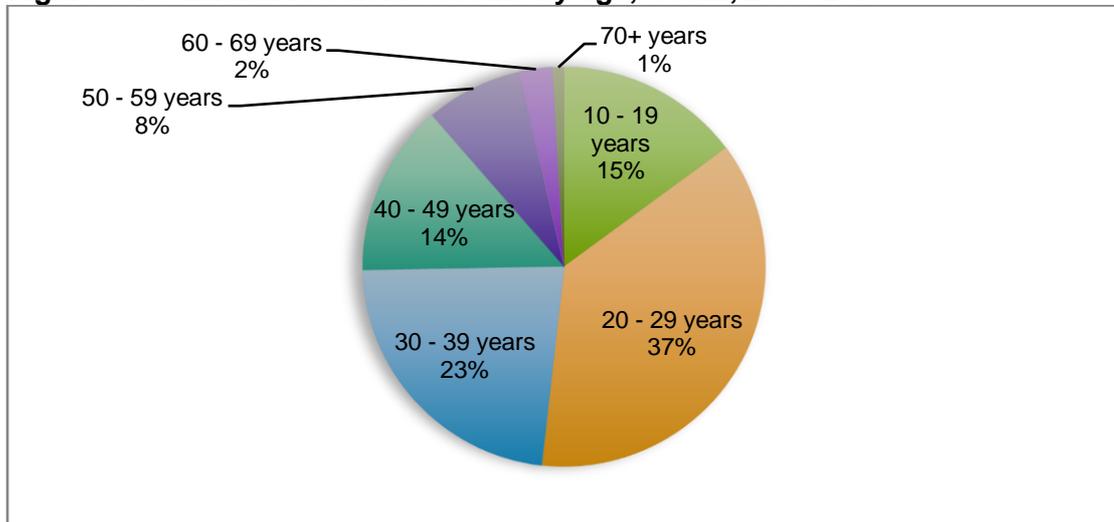
¹ American Foundation for Suicide Prevention. Suicide Statistics. (data taken from Centers for Disease Control and Prevention (CDC) Data & Statistics Fatal Injury Report for 2017). <https://afsp.org/about-suicide/suicide-statistics/>

Figure 79. Suicide death rates by age, Guam, 2015-2018



Sources: Calculated from data provided by the Office of the Chief Medical Examiner and Bureau of Statistics and Plans, 2015-2018

Figure 80. Cumulative suicide deaths by age, Guam, 2000-2018

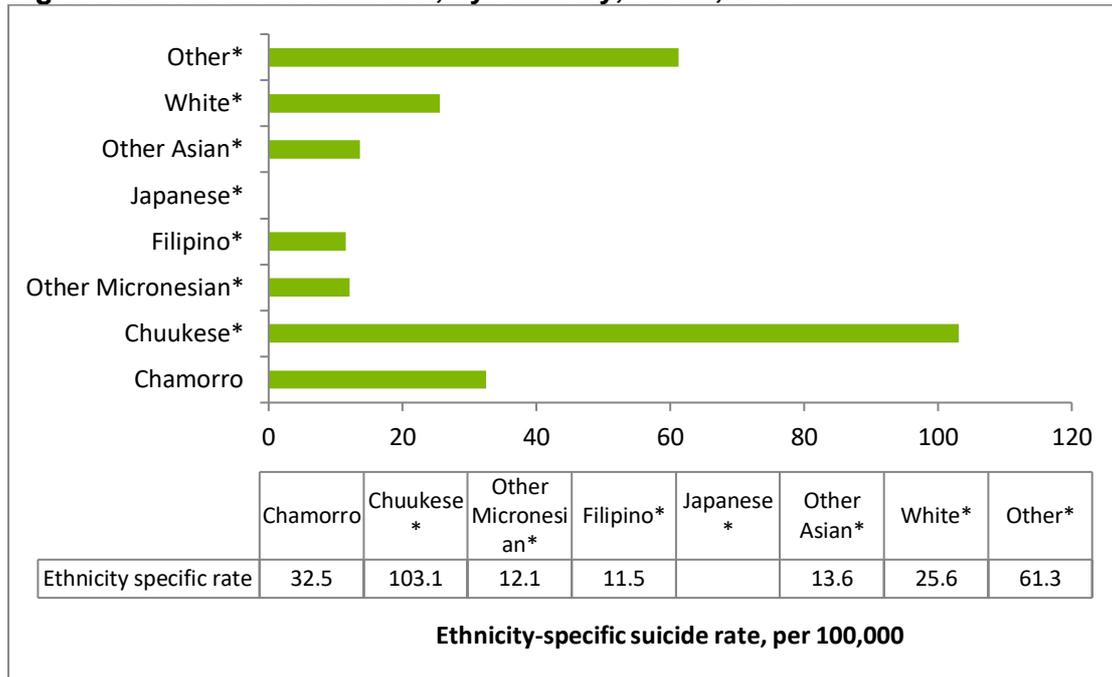


Sources: Calculated from data provided by the Office of the Chief Medical Examiner, 2016

Ethnicity

In 2018, the greatest number of suicide deaths occur among CHamorus, followed by Chuukese. However, when these are corrected for the relative contribution of each ethnic group to the total population (Figure 81), Chuukese have the highest suicide death rates per 100,000, followed by CHamorus and Whites. In contrast, in the US mainland, Pacific Islanders have the lowest suicide rates.

Figure 82. Suicide death rates, by ethnicity, Guam, 2018



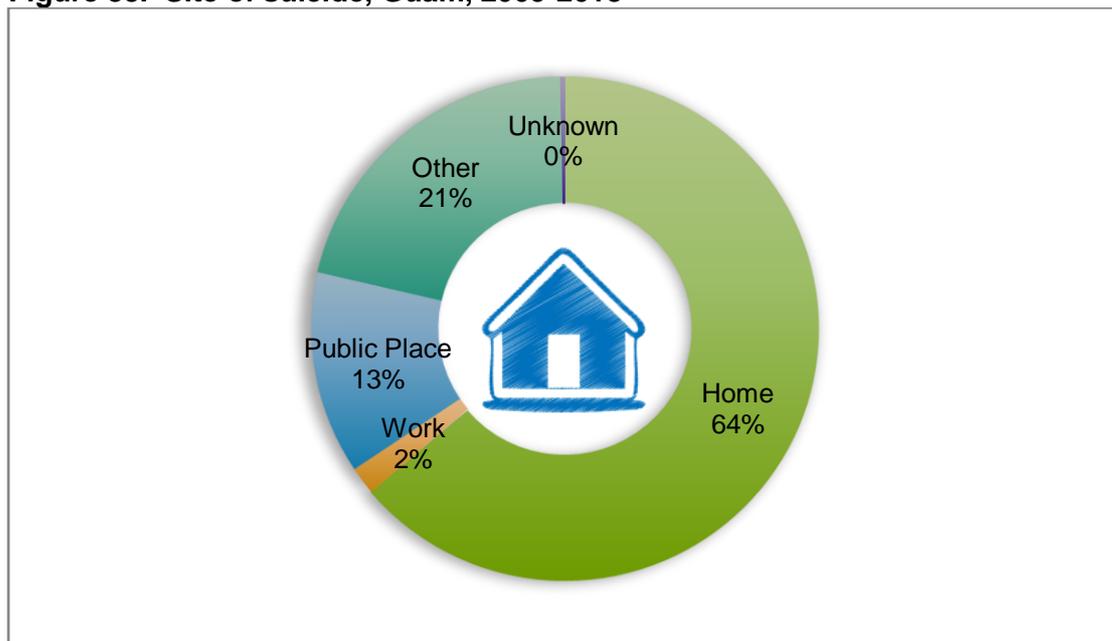
Source: Calculated from data provided by the Office of the Chief Medical Examiner, 2018, and population projections from the 2016 Guam Statistical Handbook

Note: * = actual numbers for these are small; caution needed in interpretation; the CME database still uses the old spelling "Chamorro"

Site of suicide

Cumulative 10-year data show that majority (64%) of suicides occurred in the home. Only 13% occurred in a public place (Figure 83). Suicide prevention outreach needs to involve families, to equip them to recognize suicide risk among family members and to intervene early to prevent suicide death.

Figure 83. Site of suicide, Guam, 2009-2018

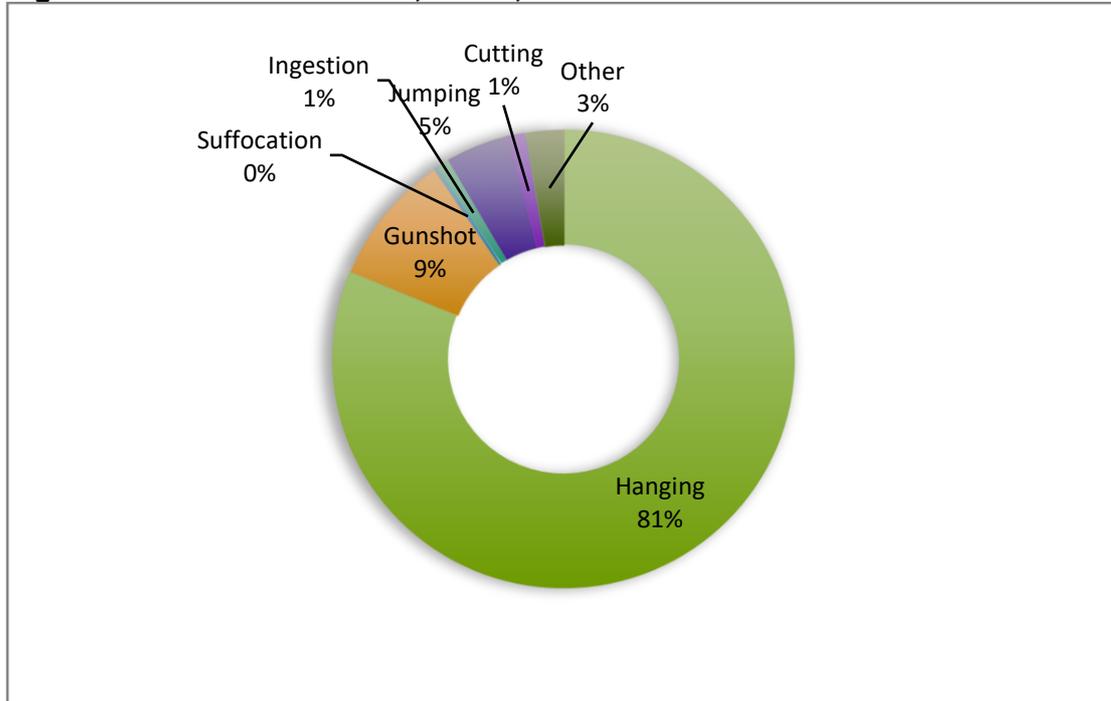


Source: Office of the Chief Medical Examiner, suicide data 2008-2016

Method of suicide

From 2009 to 2018, about 81% of suicides were by hanging, and 9% were through the use of guns (Figure 84). This contrasts markedly from the pattern in the US mainland, where suicide by firearms was the predominant method. From a prevention policy perspective, interventions that reduce access to lethal means may have a limited role in Guam.

Figure 84. Method of suicide, Guam, 2009-2018



Source: calculated from suicide data provided by the Office of the Chief Medical Examiner, 2009-2018

Evidence of intention to die

Nearly 10% of those who died of suicide from 2009-2018 left direct evidence (suicide note) of intention to die by suicide. This highlights the need for community members to be better trained to pick up on suicide intentions and intervene early to reduce the risk of attempts.

Other correlates of suicide mortality

In Guam for the years 2009- 2018:



16% involved the use of alcohol

5% involved the use of drugs



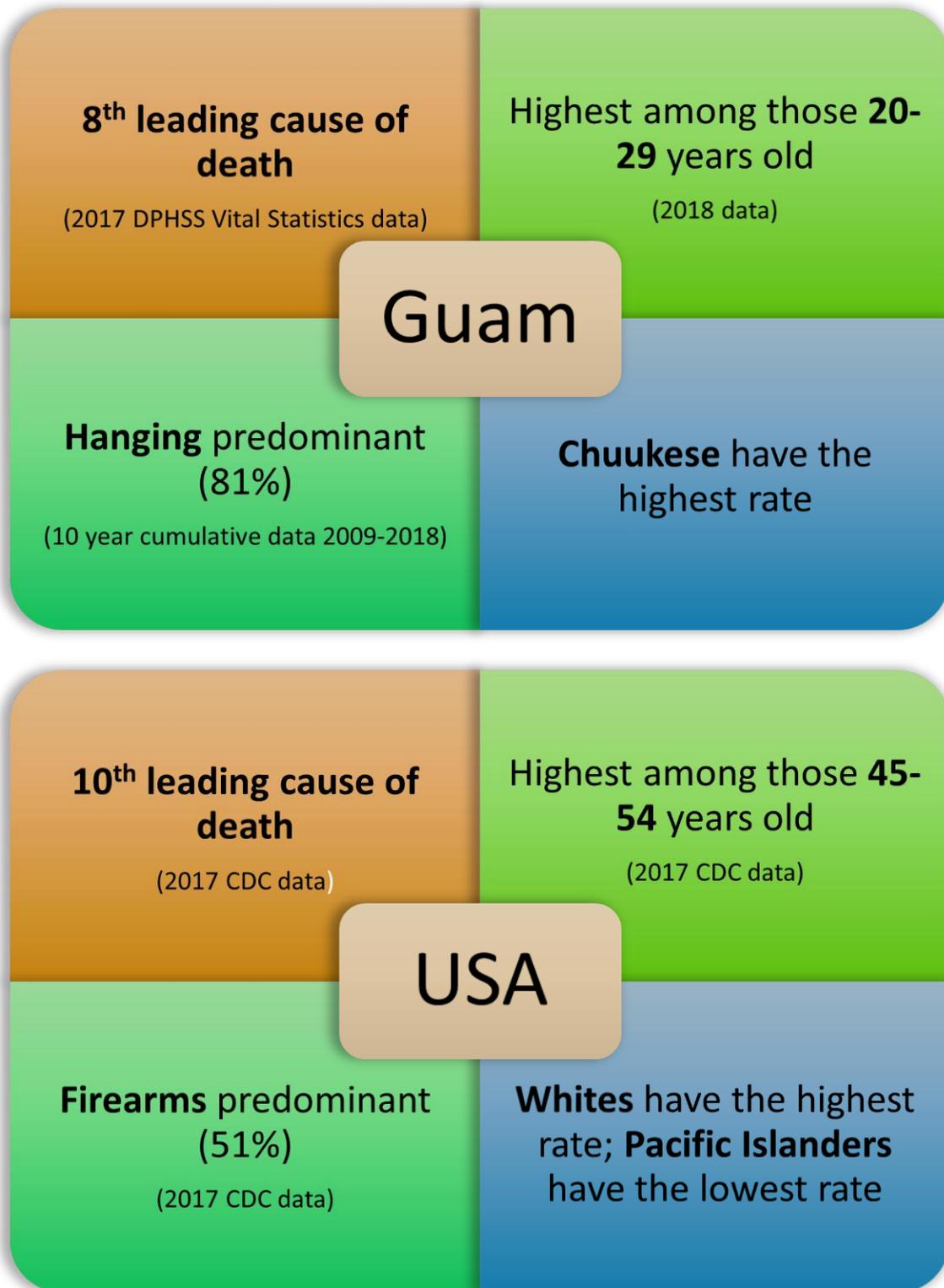
12% had a history of previous mental illness

10% had made a previous attempt



(Note: These data were obtained by interviewing family and friends of the deceased, without toxicologic confirmation. Thus, these may under-estimate the true prevalence of these correlates.)

Figure 85. Suicides, Guam vs. USA, 2018



Source: Guam data from Office of the Chief Medical Examiner, suicide data 2009-2018; US data from CDC

SUICIDE IDEATION and ATTEMPTS

Adults

Currently there is no readily accessible population surveillance mechanism to track suicidal attempts and suicidal ideation among adults on Guam. Data from Guam Memorial Hospital (GMH) on annual admissions for self-inflicted injuries are available from 2010 to 2013. A total of 155 admissions were seen during this 4-year period for this diagnostic category.

The largest number of admissions involves young adults aged 20-29, which mirrors the pattern of suicide mortality data. Chamorus, followed by Chuukese, had the greatest number of admissions.

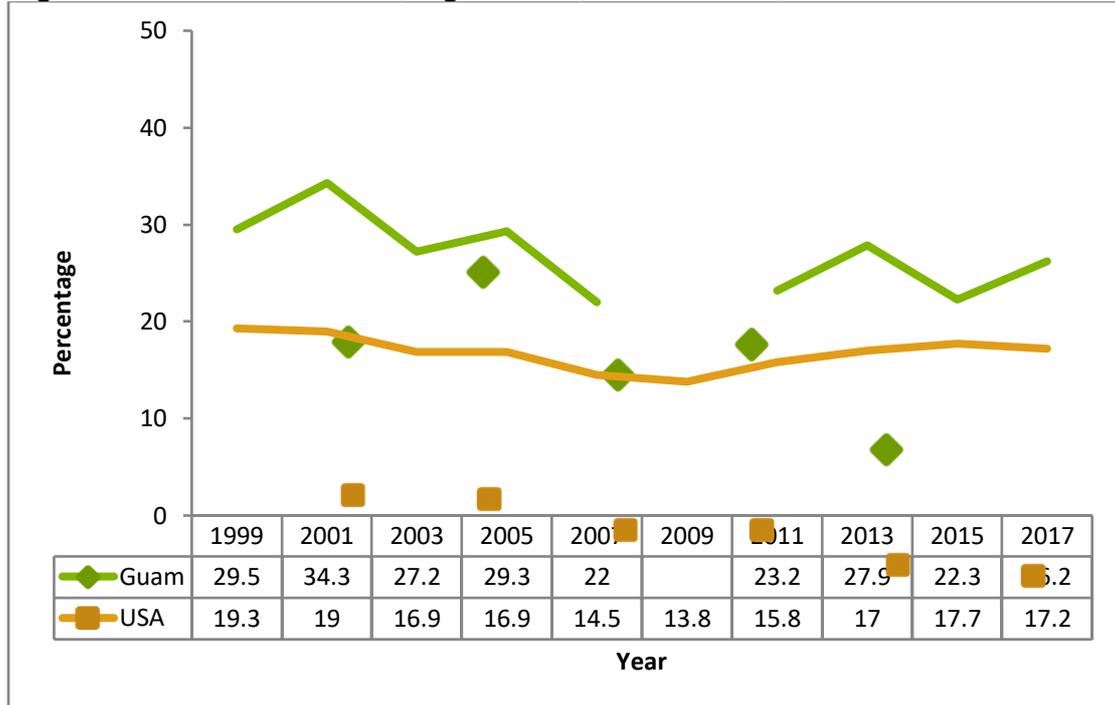
Youth

The Guam YRBS asked 4 questions on suicide:

1. During the past 12 months, did you ever seriously consider attempting suicide?
2. During the past 12 months, did you make a plan about how you would attempt suicide?
3. During the past 12 months, how many times did you actually attempt suicide?
4. If you attempted suicide during the past 12 months, did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?

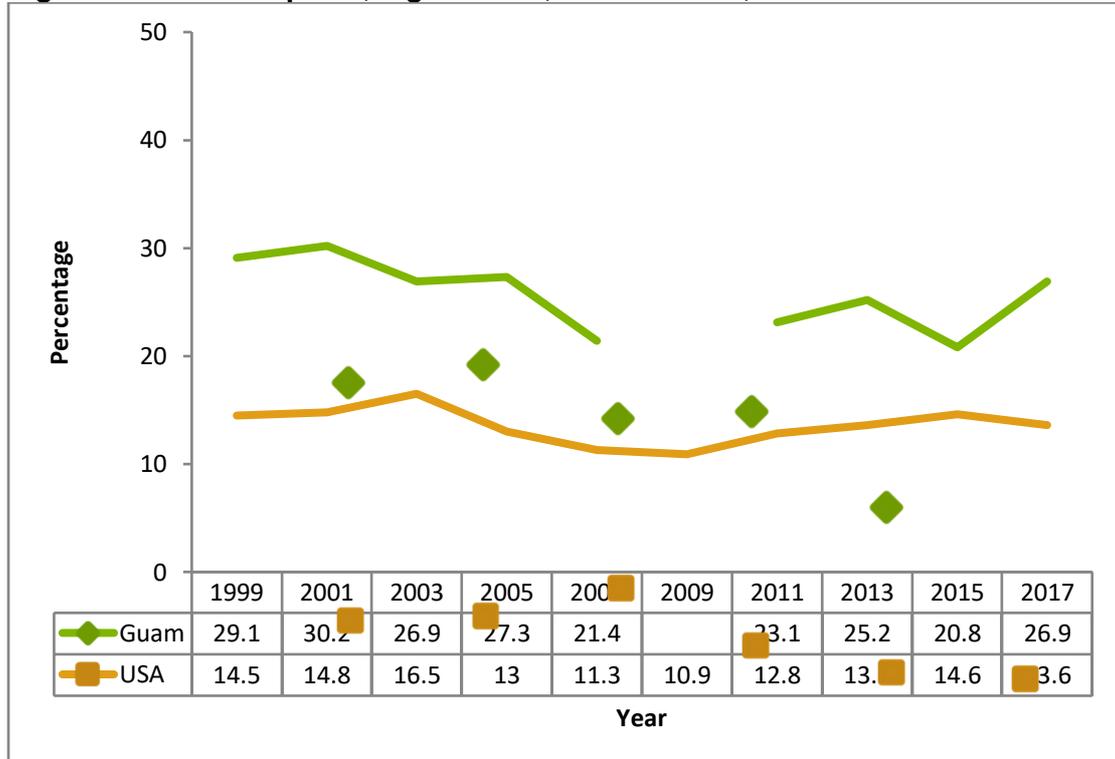
Guam surpasses the US average in all four indicators, signifying an elevated likelihood of suicidal ideation and suicide attempts among youth on Guam (Figures 86-89). However, suicidal ideation decreased among Guam youth in 2015. These data indicate that suicide prevention interventions should include youth.

Figure 86. Suicidal ideation, high school, Guam vs. US, 1999-2017



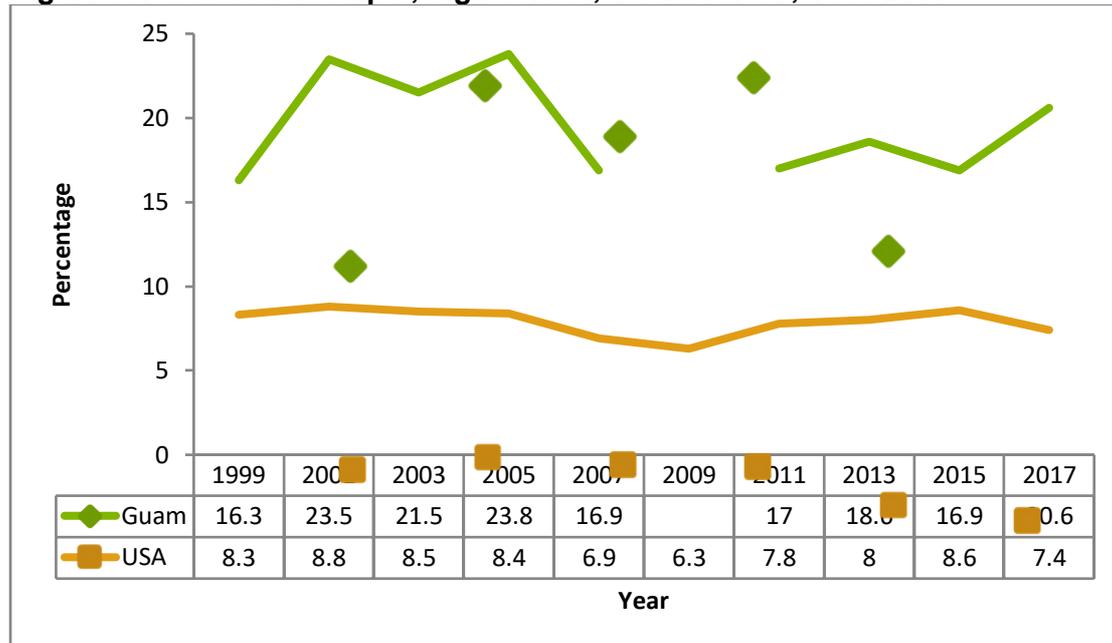
Source: GDOE, YRBS 1999-2017; US CDC Youth Online at <http://apps.nccd.cdc.gov/youthonline>
 Note: blank cells = data not available

Figure 87. Suicidal plans, high school, Guam vs. US, 1999-2017



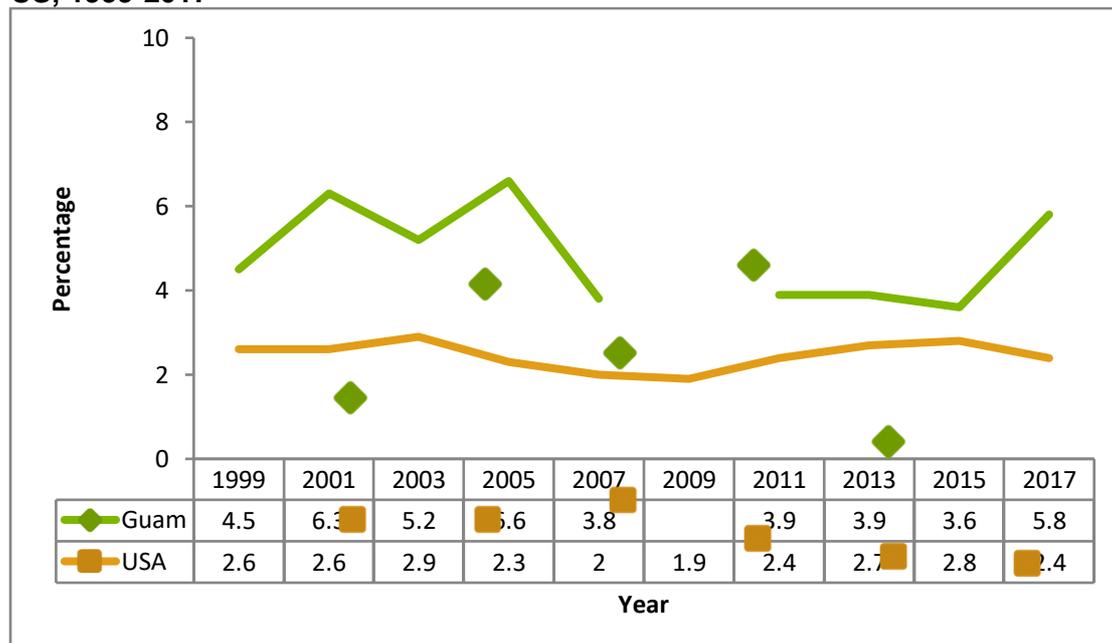
Source: GDOE, YRBS 1999-2017; US CDC Youth Online at <http://apps.nccd.cdc.gov/youthonline>
 Note: blank cells = data not available

Figure 88. Suicidal attempts, high school, Guam vs. US, 1999-2017



Source: GDOE, YRBS 1999-2017; US CDC Youth Online at <http://apps.nccd.cdc.gov/youthonline>
 Note: blank cells = data not available

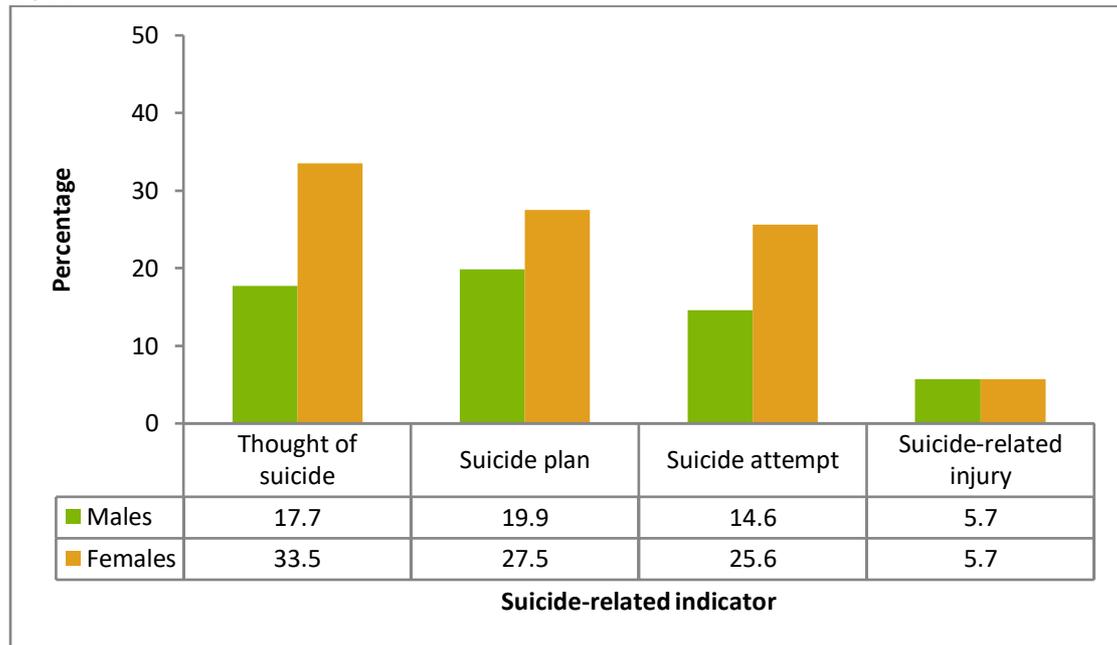
Figure 89. Suicidal attempts requiring medical attention, high school, Guam vs. US, 1999-2017



Source: GDOE, YRBS 1999-2017; US CDC Youth Online at <http://apps.nccd.cdc.gov/youthonline>
 Note: blank cells = data not available

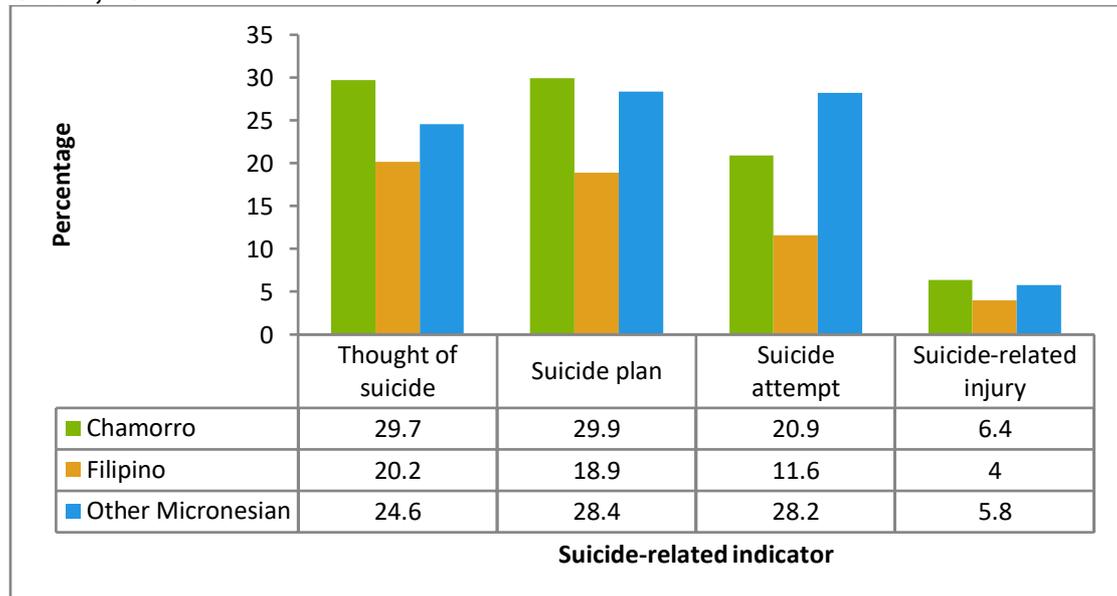
Females are more likely to think about suicide, make a plan to suicide and attempt suicide (Figure 90). Chamorus and Micronesian Islanders are most likely to think about suicide, make a plan to suicide, and actually attempt suicide, but there is no difference across these ethnic categories for serious attempts at suicide that require medical treatment (Figure 91).

Figure 90. Suicidal ideation and suicide attempts by sex, high school, Guam, 2017



Source: GDOE, YRBS 2017

Figure 91. Suicidal ideation and suicide attempts by ethnicity, high school, Guam, 2017



Source: GDOE, YRBS 2017

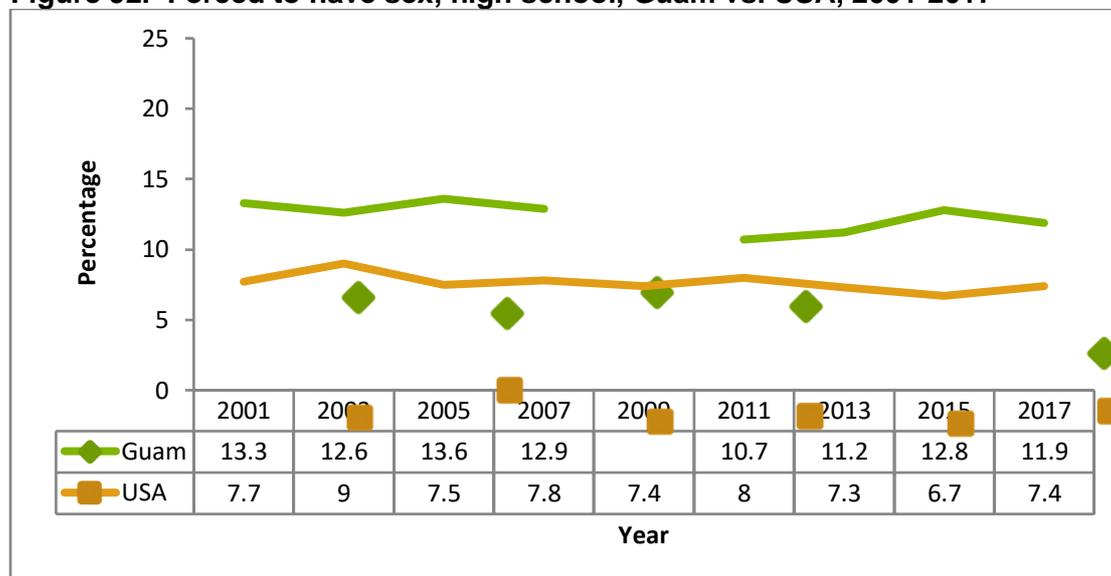
Note: The YRBS still uses the old spelling "Chamorro"

OTHER SUICIDE RISK FACTORS

The scientific literature indicates that sexual history, physical violence, a history of mental illness and the use of tobacco, alcohol and illicit drugs may increase the risk of suicidal ideation and attempts. In Guam, alcohol and mental illness have been associated with suicide deaths.

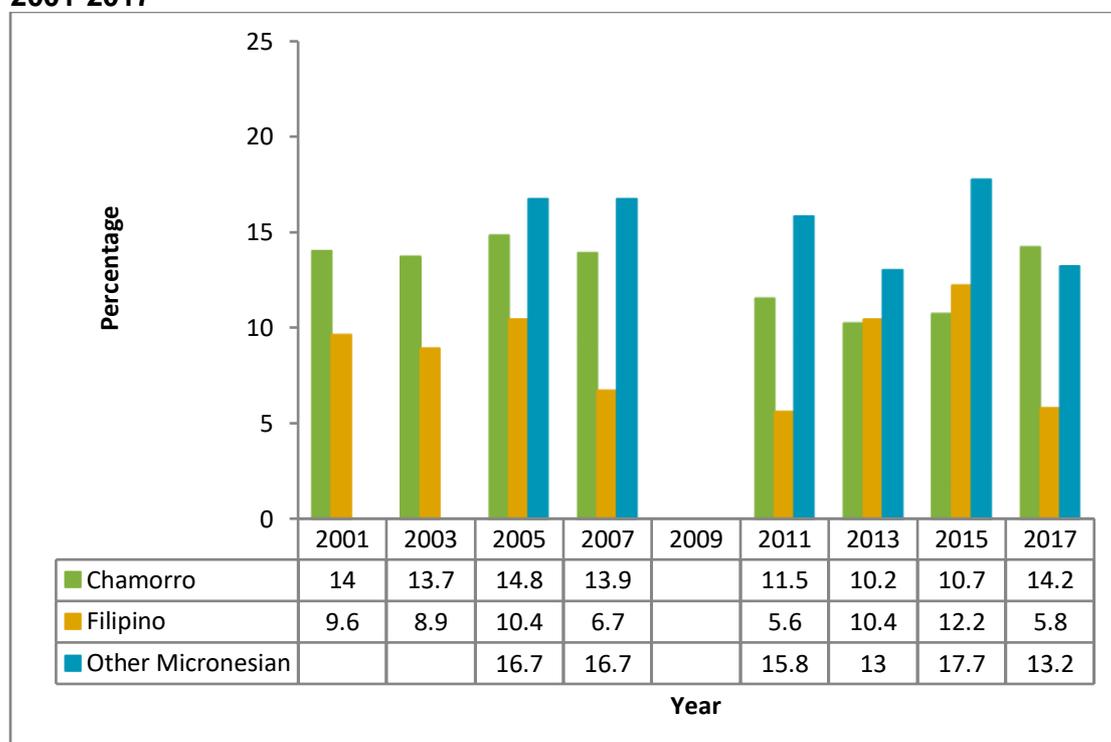
Sexual violence among Guam high school students is significantly higher than the US averages. The proportion of high school students reporting having been forced to have sex was almost twice the US median in 2017 (Figure 92). CHamorus and Micronesians reported the highest rates (Figure 93).

Figure 92. Forced to have sex, high school, Guam vs. USA, 2001-2017



Source: GDOE, YRBS 2001-2017; US CDC Youth Online at <http://apps.nccd.cdc.gov/youthonline>
 Note: blank cells = data not available

Figure 93. Forced to have sex in the past year by ethnicity, high school, Guam, 2001-2017



Source: GDOE, YRBS 2001-2017
 Note: blank cells = data not available; the YRBS still uses the old spelling "Chamorro"

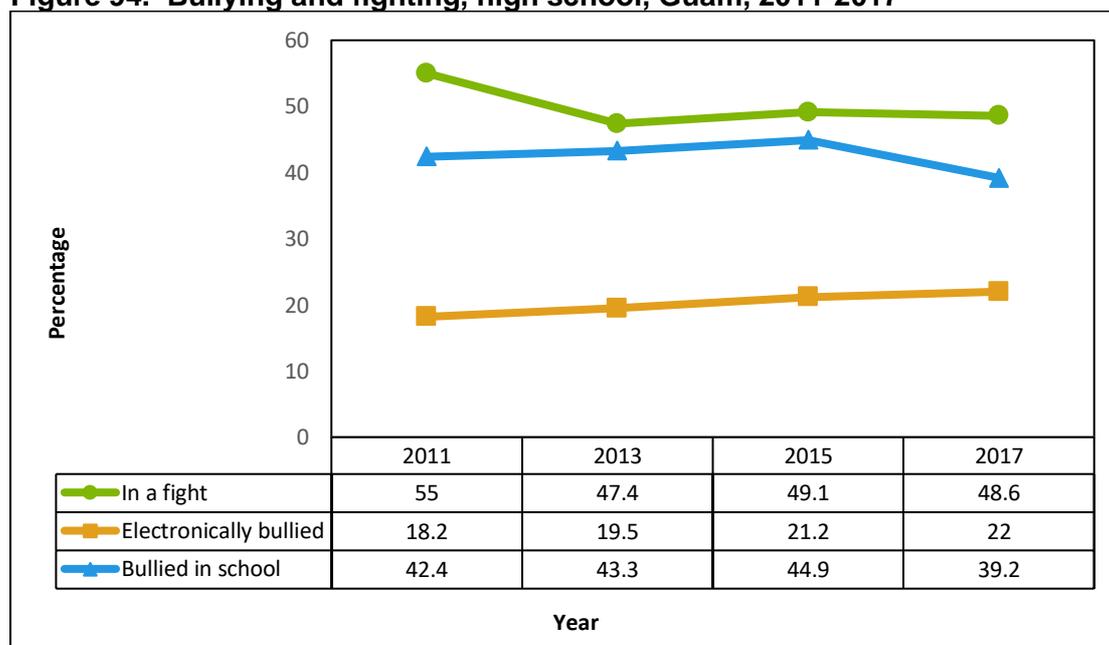
Bullying and physical violence may also be linked to an increased likelihood for suicide. In 2017 for every 100 Guam high school students:

- 3 carried a weapon on school property at least 1 day during the 30 days before the survey;
- 6 carried a gun on at least 1 day during the past year;
- 7 were threatened or injured with a weapon on school property;
- 12 were in a physical fight on school property;
- 11 did not attend class because they felt unsafe in school;
- 13 were electronically bullied in the past year; and
- 16 were bullied on school property;
- 26 were in a physical fight one or more times in the past year, and 5 were injured in a physical fight;

(Source: GDOE, YRBS 2017)

The reported prevalence of violence and bullying have not changed over time (Figure 94).

Figure 94. Bullying and fighting, high school, Guam, 2011-2017



Source: GDOE, YRBS 2011-2017

Addressing sexual and physical violence and bullying should be integral to suicide prevention efforts among youth in Guam.

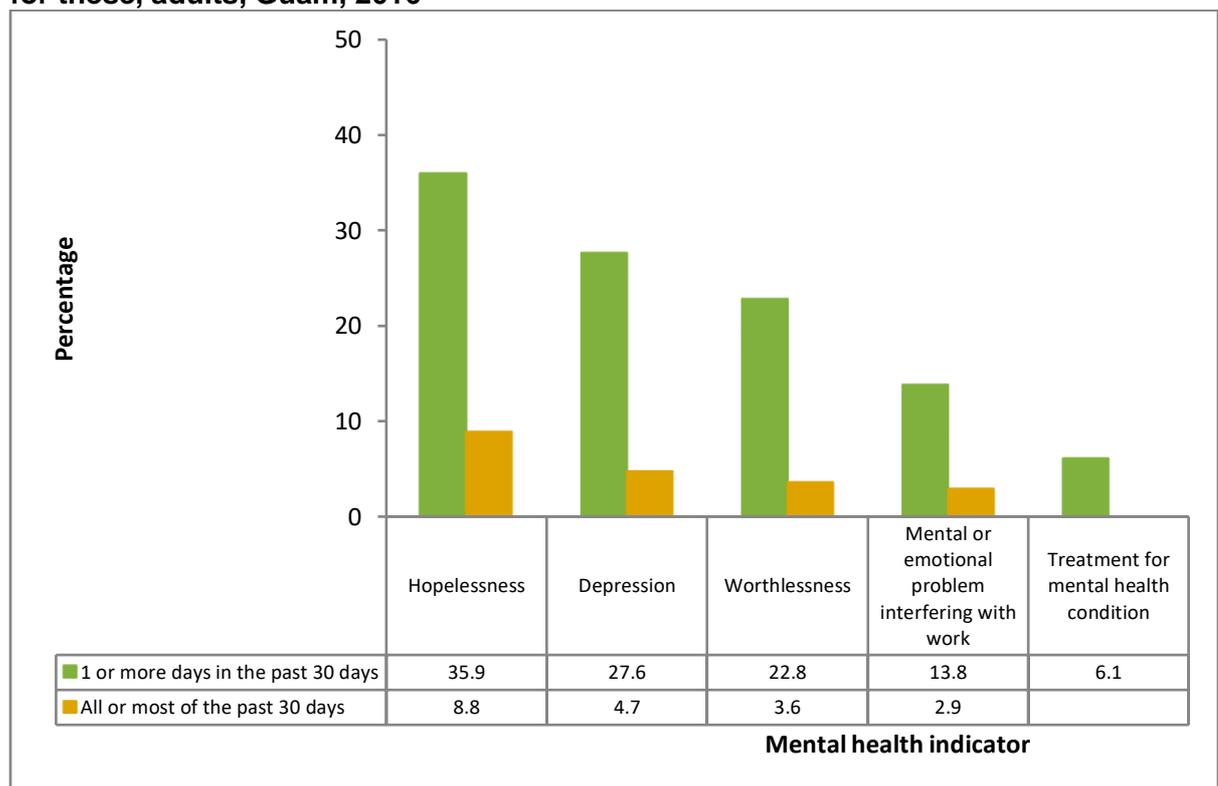
MENTAL HEALTH

Mental illness is closely linked to substance abuse and suicide. The GBHWC started commissioning mental health questions incorporated into the BRFSS in 2013, and risk and protective factors questions into the YRBS since 2011. BRFSS also asks about depression diagnosis as part of the Chronic Diseases Indicators. The latest data on adults are from 2016 (optional questions) and 2018 (depression diagnosis); for youth, the latest data are from 2017. National data is not available for the mental health questions in the optional modules, but comparative data exist for depression diagnosis in BRFSS.

ADULTS

In 2016, 36% of adults in Guam reported feeling hopeless, 23% felt worthless, and 28% reported feeling so depressed that nothing could cheer them up, on one or more of the past 30 days. Of these adults, 8.8% felt hopeless, 4.7% felt depressed and 3.6% felt worthless on all or most of the past 30 days. Almost 14% stated they suffered from a mental or emotional problem that hindered them from working or performing usual activities in the past 30 days, yet only 6% were taking medication or receiving treatment for their condition (Figure 95).

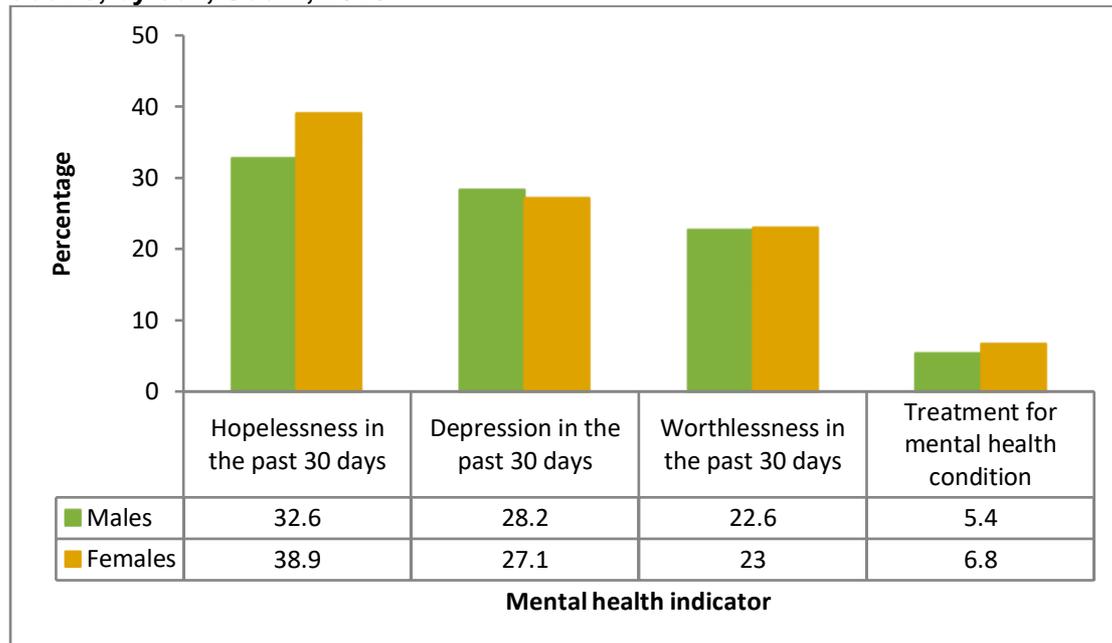
Figure 95. Prevalence of mental health symptoms and conditions and treatment for these, adults, Guam, 2016



Source: DPHSS and GBHWC, BRFSS State-added questions, 2016
 Note: blank cells = data not available

These symptoms appear equally distributed across the sexes (Figure 96).

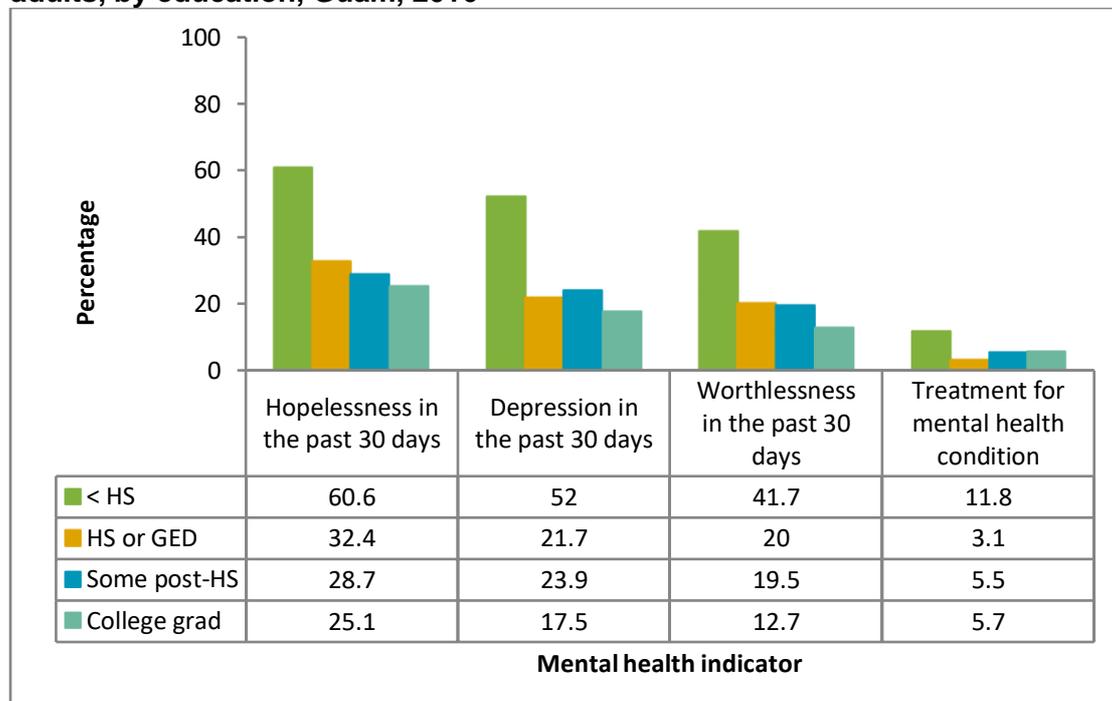
Figure 96. Prevalence of mental health symptoms and conditions and treatment, adults, by sex, Guam, 2016



Source: DPHSS and GBHWC, BRFSS State-added questions, 2016

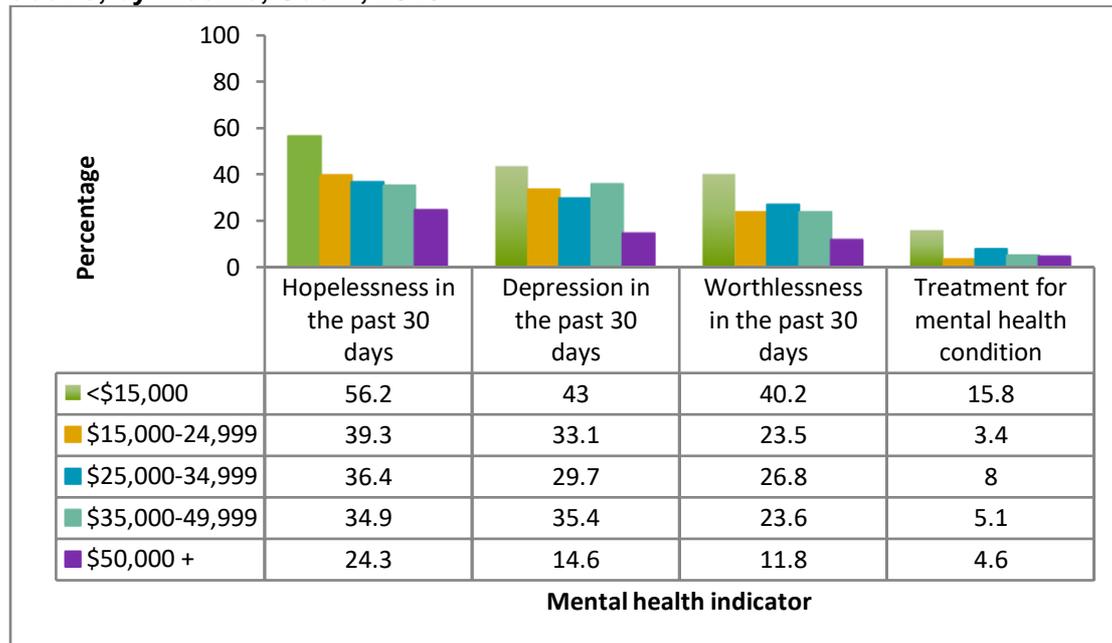
Mental conditions or emotional problems involving hopelessness, depression and worthlessness were more prevalent among those with lower education and income (Figures 97-98). Micronesians were most likely to report hopelessness, depression and worthlessness, and to be receiving treatment for their mental conditions (Figure 99).

Figure 97. Prevalence of mental health symptoms and conditions and treatment, adults, by education, Guam, 2016



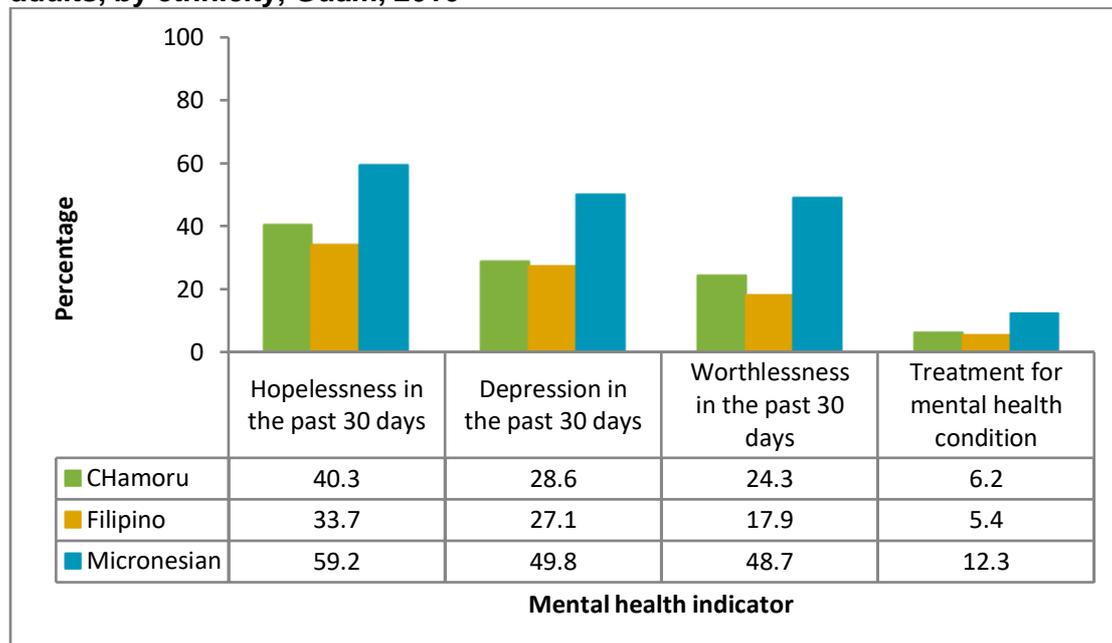
Source: DPHSS and GBHWC, BRFSS State-added questions, 2016

Figure 98. Prevalence of mental health symptoms and conditions and treatment, adults, by income, Guam, 2016



Source: DPHSS and GBHWC, BRFSS State-added questions, 2016

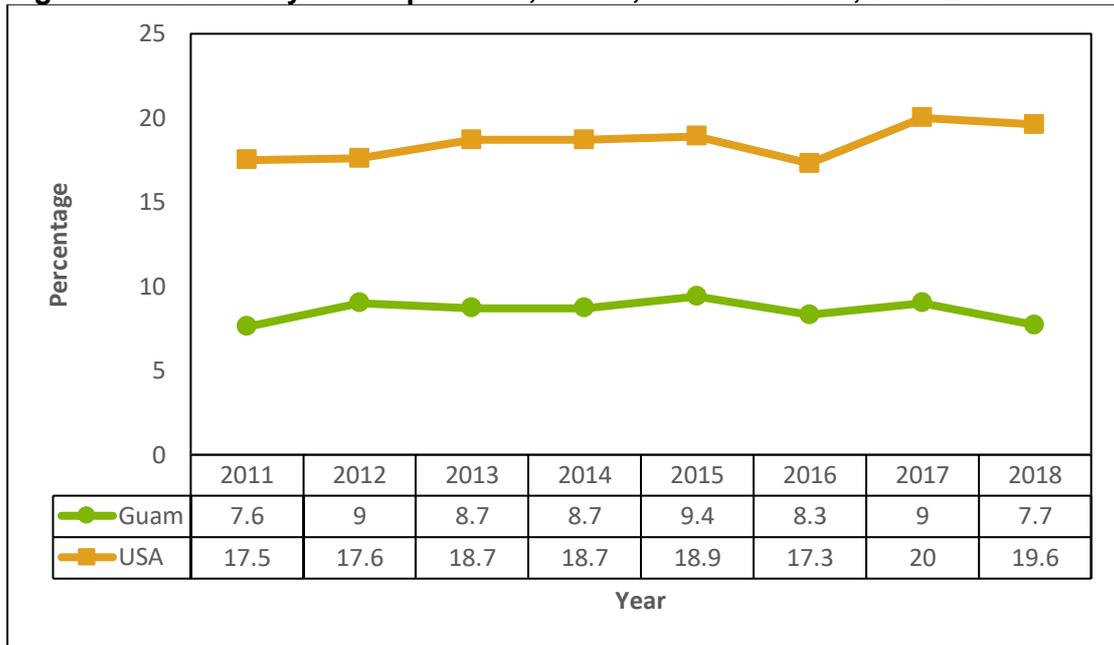
Figure 99. Prevalence of mental health symptoms and conditions and treatment, adults, by ethnicity, Guam, 2016



Source: DPHSS and GBHWC, BRFSS State-added questions, 2016

In 2018, nearly 8% of Guam adults reported being told they had a form of depression; this is unchanged from previous years. Depression among adults is lower in Guam than in the US (Figure 100). No statistical differences were noted across sex, education or income level.

Figure 100. Told they had depression, adults, Guam vs. USA, 2011-2018

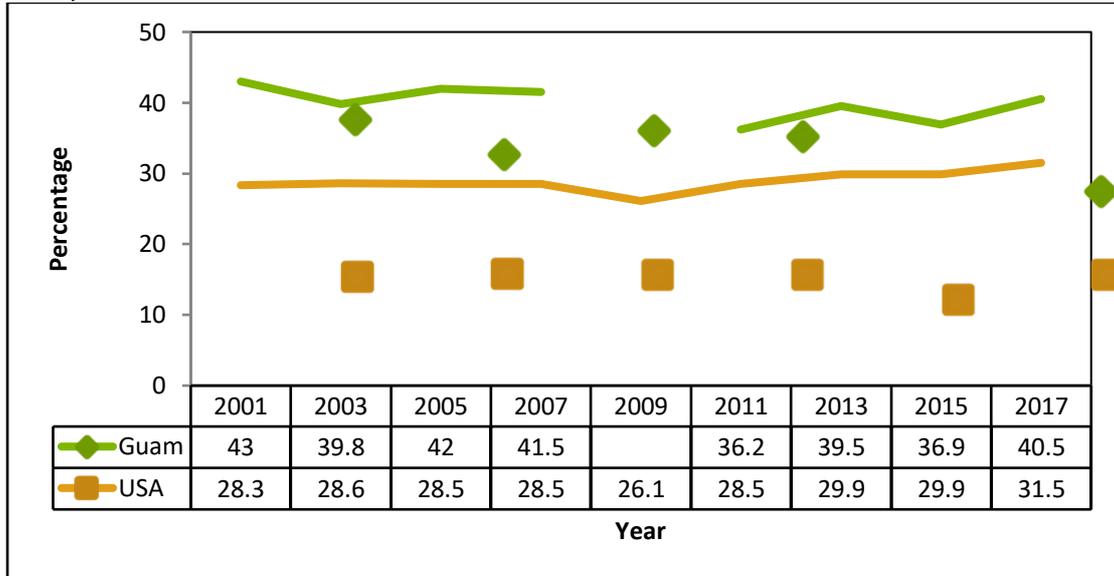


Source: Guam DPHSS, BRFSS, 2011-2018; CDC, BRFSS, 2011-2018

YOUTH

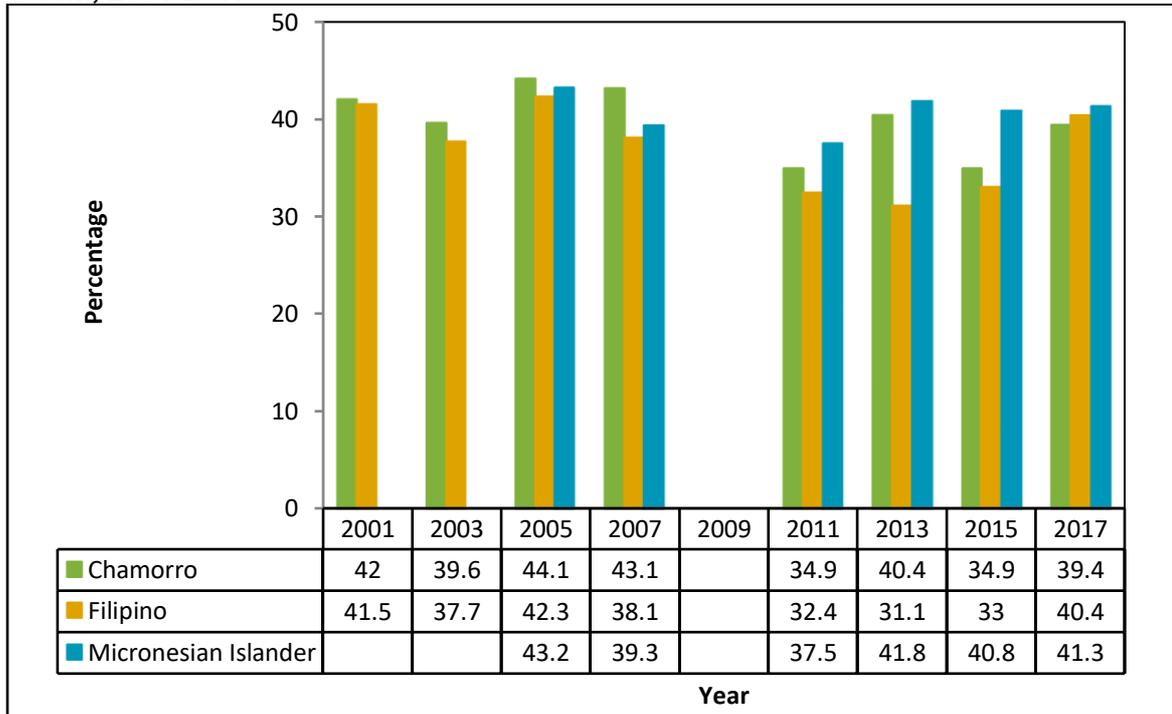
Persistent sadness is an indicator for depression. Reporting sadness or hopelessness was higher among youth in Guam (Figure 101). The prevalence of depressive symptoms did not vary among youth of different ethnicities (Figure 102). This suggests that depression screening and early referral to mental health professionals should be conducted routinely among all high school youth, as a mental health and suicide prevention intervention.

Figure 101. Feeling sad for at least 2 weeks over the past 12 months, Guam vs. USA, 2001-2017



Source: GDOE, YRBS 2001-2017; US CDC Youth Online at <http://apps.nccd.cdc.gov/youthonline>
 Note: blank cells = data not available

Figure 102. Feeling sad for at least 2 weeks over the past 12 months by ethnicity, Guam, 2001-2017



Source: GDOE, YRBS 2001-2017; US CDC Youth Online at <http://apps.nccd.cdc.gov/youthonline>
 Note: blank cells = data not available

CONCLUSIONS AND RECOMMENDATIONS

This version of the Guam Epidemiological Profile is an expanded version that seeks to combine substance abuse, suicide and mental health data in a comprehensive but user-friendly data document. These three areas of behavioral health are intrinsically linked, and the interrelationships are broad and far-reaching.

Challenges in substance abuse prevention and control remain. Tobacco use remains high, and smoking, smokeless and electronic vaping product use are significantly higher in Guam than in the US. On the positive side, smoking is declining among both youth and adults. However, because of many years of elevated tobacco consumption, the health burden in relation to tobacco-related noncommunicable diseases (NCD) like cancer is already being manifested in rising disease incidence and premature mortality. Smokeless tobacco use is nearly double the US rate. Electronic vaping product use among youth is markedly higher than the US median and needs to be carefully monitored.

Current drinking among adults in Guam remains lower than US rates. However, unsafe alcohol use - binge drinking and heavy drinking - is higher in Guam. Youth alcohol consumption reflects the powerful and immediate impact of sound policies---current and binge drinking among Guam youth dropped markedly following policy milestones in 2003, 2010 and 2014, and continues to decline.

Decreases in smoking also occurred in direct temporal association with key policy initiatives. In contrast, marijuana prevalence among youth remained unchanged, and rates for current and lifetime use were notably higher in Guam than in the US. These findings support the relatively quick and considerable population impact of policy change, particularly among youth, who are considered a vulnerable population for substance abuse. It will be critical to track future marijuana consumption, with the recently enacted medical marijuana act that legalizes marijuana use for medical reasons. Guam's Epi Profile highlights the pivotal role of environmental interventions through sound policies in substance abuse prevention.

Suicide rates are rising after a brief drop in the crude death rate. Mortality data is supplemented with risk factor surveillance data from the YRBS and BRFSS. Suicide prevention remains a key public health priority, and the data point towards specific strategies to reduce suicide in Guam. These strategies include:

- Targeting suicide prevention efforts towards youth and young adults, especially Micronesian Islanders, Japanese and CHamorus;
- Preventing and controlling alcohol and other drug abuse;
- Aggressively screening to recognize and treat mental illness and depression, including within schools;
- Building community capacity to recognize the signs of impending or possible suicide and training families, community members and first responders to

effectively intervene to bring individuals at risk of suicide to professional attention;

- Training emergency room personnel and other hospital personnel to do brief interventions and referral to GBHWC and other mental health treatment providers for all cases of attempted suicide; and,
- Skills training in developing healthy relationships, avoiding physical and sexual violence, and countering bullying.

Mental health indicators highlight the discrepancy between those who have a debilitating mental condition or emotional problem and those who receive treatment for their condition. In particular, symptoms of depression appear pervasive among our youth, suggesting that depression screening and early referral to mental health providers should be conducted routinely among all high schools.

By examining substance abuse, suicide and mental health through disaggregated data, this Profile makes note of disparities across socio-economic and demographic sub-groups. Furthermore, this analysis begins to define the linkages between social determinants of consumption and disparities in health and social consequences of substance abuse, such as the higher smoking and binge drinking prevalence among CHamorus and other Micronesians and their notably higher rates of tobacco and alcohol-related cancer mortality, and likelihood of committing suicide.

For this edition of the Profile, (1) State-added questions on the BRFSS, including Guam-specific ethnicity categories, could not be accessed and (2) no new data were available on special populations – the LGBT community and out-of-school youth in the Department of Youth Affairs. Once new data are available, they will be incorporated in future iterations of the Epi Profile.

This expanded Profile represents the culmination of multiple efforts through the years by Guam's SEOW to strengthen and expand the substance abuse and mental health surveillance system. Over the years, with SAMHSA/CSAP support [through the SPF-SIG, Focus on Life, SEOW and Partnerships for Success (PFS) grants], Guam has upgraded its substance abuse and mental health data capacity and infrastructure. For example, the previous lack of adult illicit drug use data was addressed through an ongoing Memorandum of Understanding between DPHSS and GBHWC.

Some data limitations remain. For example, youth in the private schools, and the military are not covered by the current surveillance mechanisms. The SEOW and PEACE Office conducted a survey among students within the Catholic school system but were not given permission to release the results in public.

Guam also is constantly challenged by the difficulties of working with small numbers. Especially when data is disaggregated, the totals are often too small for accurate trending, and interpretation of for example, year-to-year changes or comparisons across similarly small groups are fraught with uncertainty. The lack of standardization in defining subgroup categories, such as age groups and ethnicity, sometimes within the same surveillance system across time, also make comparisons challenging.

Nonetheless, this Profile attests to the enhanced data capacity developed through the years, with leadership by the SEOW and support from the GBHWC PEACE Office and SAMHSA/CSAP. Evidence-based prevention is now facilitated and guided by accessible data in Guam.

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