



# FSM Youth NCD Risk Factors

2017 Report

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## FSM Summary

The aim of this report is to present current prevalence of certain risk factors for developing non-communicable disease (NCD) among high school youth in all four states of the Federated States of Micronesia (FSM). These data can be used to better understand the burden of these risk factors, monitor trends, and determine who is at greatest risk for poor health in order to improve health among FSM youth through the development of targeted evidence-based interventions. The table below compares selected comparable indicators in FSM to Guam, Commonwealth of the Northern Mariana Islands (CNMI), and the United States (US). Green shading represents the location with the “best” prevalence, followed by orange shading, and red shading.

	<b>FSM</b>	<b>Guam*</b>	<b>CNMI*</b>	<b>US*</b>
<b>Substance Use</b>	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Smoking (within past 30 days)	28.9 (27.5-30.3)	13.2 (10.5-16.6)	12.4 (11.0-13.9)	8.8 (7.2-10.7)
Tobacco chewing (within past 30 days)	31.7 (30.3-33.1)	13.5 (10.6-16.9)	15.2 (13.7-16.9)	5.5 (4.4-6.7)
Alcohol use (within past 30 days)	30.7 (29.3-32.1)	18.2 (15.1-21.8)	23.3 (21.4-25.3)	29.8 (27.3-32.4)
<b>Overweight/obesity</b>				
Had obesity	14.9 (13.8-16.0)	23.0 (19.8-26.5)	16.4 (14.8-18.1)	14.8 (13.8-15.8)
Were overweight	20.5 (19.2-21.8)	19.3 (16.8-22.1)	18.2 (16.6-20.0)	15.6 (14.7-16.6)

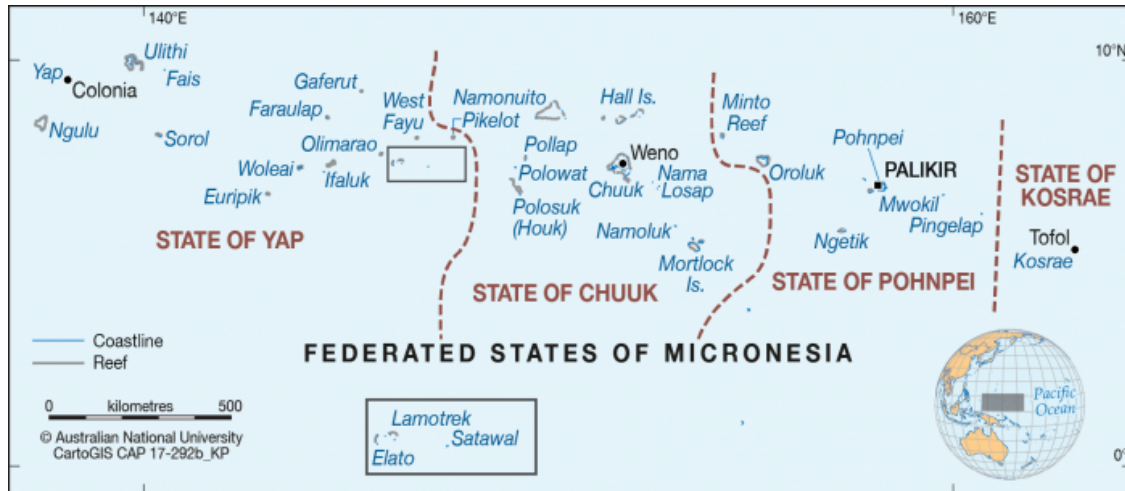
\*Guam, CNMI, and US data from the 2017 YRBS; overweight/obesity in Guam, CNMI, and US are based on self-report of height and weight.

## State Summary

The grid below displays the prevalence of core NCD indicators in FSM National (middle column in grey), as well as prevalence in each individual state. Green shading represents the state with the “best” prevalence compared to the National prevalence, followed by orange shading, and red shading.

	<b>Chuuk</b>	<b>Kosrae</b>	<b>FSM Nat</b>	<b>Pohnpei</b>	<b>Yap</b>
<b>Substance Use</b>	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Smoking (within past 30 days)	19.4 (16.9-21.9)	24.6 (21.0-28.2)	28.9 (27.5-30.3)	30.8 (28.8-32.9)	39.0 (35.5-42.7)
Tobacco chewing (within past 30 days)	24.8 (22.1-27.5)	25.7 (22.1-29.3)	31.7 (30.3-33.1)	27.1 (25.1-29.1)	60.7 (57.0-64.4)
Alcohol use (within past 30 days)	17.4 (15.0-19.8)	18.2 (15.0-21.4)	30.7 (29.3-32.1)	35.9 (33.8-38.0)	45.5 (41.7-49.3)
<b>Overweight/obesity</b>					
Had obesity	19.4 (16.9-21.9)	18.2 (15.0-21.4)	14.9 (13.8-16.0)	12.7 (11.2-14.2)	11.1 (8.2-14.0)
Were overweight	21.0 (18.4-23.6)	19.9 (15.0-21.4)	20.5 (19.2-21.8)	20.0 (18.2-21.8)	22.3 (18.4-26.2)

## Background



**Figure 1. Map of FSM**

Source: <https://asiapacific.anu.edu.au/maponline/base-maps/federated-states-micronesia-0>

The Federated States of Micronesia (FSM) is made up of four states (Chuuk, Kosrae, Pohnpei, and Yap) located in the Pacific Ocean east of the Philippines. FSM has a total land area of 271 square miles over 607 islands that occupy over one million square miles of Pacific Ocean. As of 2010, the total population of FSM was 102,624. The most populated state is Chuuk (48,651) followed by Pohnpei (35,981), Yap (11,376), and Kosrae (6,616).

All four FSM states have declared a State of Health Emergency due to the epidemic of non-communicable diseases (NCDs). This is largely due to loss of longevity, quality of life, and loss of workforce productivity due to NCDs. There has been a shift away from traditional lifestyle and foods that negatively impacts the culture and health of Micronesians. The majority of the adult population in FSM is now overweight or obese, smoking prevalence is high, and use of betel nut (generally with tobacco) has recently become common throughout the FSM.

In 2010, the Pacific Island Health Officers' Association (PIHOA) declared a regional health emergency due to the epidemic of NCDs in the US-Affiliated Pacific Islands (USAPIs). The USAPIs include American Samoa, Commonwealth of the Mariana Islands (CNMI), Guam, Federated States of Micronesia (FSM), Republic of Palau, and Republic of the Marshall Islands. Stemming from this regional declaration of emergency, all six of these USAPIs agreed upon a regional NCD surveillance framework that includes core NCD and risk factor indicators that need to be routinely and consistently collected across the region in order to monitor the progress of local and regional NCD responses. This includes the following core youth indicators to be measured among high school youth every two years: 30-day tobacco smoking, 30-day tobacco chewing, 30-day alcohol use, and overweight/obesity (by physical measurement of height and weight). Therefore, Pohnpei and Kosrae adopted a biannual "Rapid Youth High School Survey" in 2015. Chuuk joined this effort in 2017. Meanwhile, Yap conducted its own youth survey in 2016. Therefore, this is the first time we have been able to combine high school youth data from all four states to calculate National estimates. The goal is to have all four states implement the "Rapid Youth High School Survey" in 2019 and every two years afterwards moving forward.

## Methodology

The Rapid Youth High School Survey tools used in Pohnpei, Kosrae, and Chuuk were developed by the State Department of Health Services with assistance from PIHOA to ensure that indicators aligned with the PIHOA NCD Surveillance Framework, and that data were collected consistently across all states. This survey instrument collects data on core youth NCD indicators (30-day tobacco smoking, tobacco chewing, betel nut chewing, and alcohol use and overweight/obesity). In 2017, Pohnpei also added additional indicators on blood pressure and reproductive health. All students in grades 9-12 present on the survey day are eligible to participate in the survey. Yap State developed and conducted their own youth high school survey with a large number of indicators that was conducted in 2016.

The Pohnpei, Kosrae, and Chuuk, Rapid Youth High School Surveys were conducted during the 2017-2018 school year. The Yap Youth Survey was conducted during the 2016-2017 school year. Prior to data collection, all staff were trained on survey administration. This included training on physical measurements of height and weight in Pohnpei, Kosrae, and Chuuk. For the Rapid High School Surveys, staff first recorded demographic information of each student in Section 1 of the paper survey form, then took height and weight and also recorded these in Section 1. Section 2 of the paper survey form was then completed by students confidentially and turned in anonymously to collect information on substance use. In Yap, all data were collected by self-report of students. In all states, health staff entered the paper surveys into a Microsoft Excel database. PIHOA provided technical support for the cleaning and analysis of these data.

Data on substance use are all based on self-report across all four states. Measured height and weight were used to calculate Body Mass Index (BMI) in Pohnpei, Kosrae, and Chuuk (using the Rapid Youth High School Survey). Self-reported height and weights were collected in Yap. BMI percentiles were used to determine BMI categories for those students under 17 years old in Pohnpei, Kosrae, and Chuuk. Adult BMI calculations were used for those students 18 and older in Pohnpei, Kosrae, and Chuuk. In Yap, adult BMI categories were used for all students because specific ages were not collected on students (only age ranges were collected). Overall, all students were classified as underweight, healthy, overweight, or obese using cutoffs specified by the Centers for Disease Control and Prevention (CDC).

Data were combined from all four states using Rapid Youth High School Survey data (Pohnpei, Kosrae, Chuuk) and the Yap Youth Survey. Data on demographics (grade, gender) and core NCD indicators were used for analysis in this report.

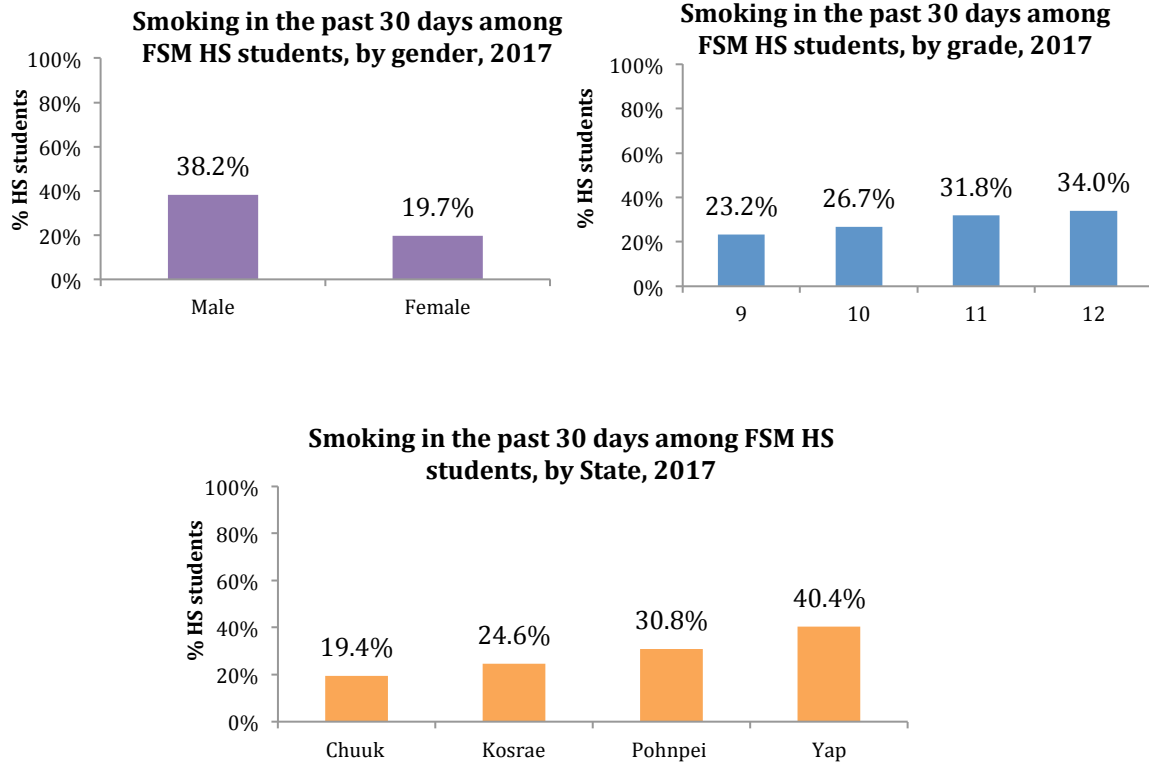
## Sample Characteristics (N=4186)

<b>Demographic Characteristics</b>	<b>N</b>	<b>%</b>
<b>Gender</b>		
Male	2017	48.4%
Female	2147	51.6%
<b>Grade</b>		
9	1225	29.5%
10	999	24.1%
11	1004	24.2%
12	919	22.2%
<b>State</b>		
Chuuk	980	23.4%
Kosrae	560	13.4%
Pohnpei	1947	46.5%
Yap	699	16.7%
<b>Total</b>	<b>4186</b>	<b>100.0%</b>

Overall, there were a total of 4,186 high school students surveyed across all four states. However, it should be noted that based on population size, the number of high school students from Chuuk are lower than expected. This is due to high numbers of out-of-school youth and missing surveys. Therefore, Chuuk is under-represented in the overall FSM estimates. This is a limitation that should be noted and addressed in future surveys.

## Smoking

28.9% of high school students in FSM are current smokers (smoked in the past 30 days).



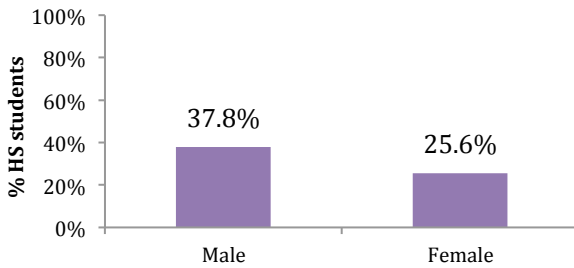
Male students have a smoking prevalence about twice as high as female students (38.2% vs. 19.7%). Smoking prevalence increases by grade, reaching 34.0% among 12<sup>th</sup> graders in FSM. Smoking prevalence varies by state, ranging from 19.4% in Chuuk to 40.4% in Yap.



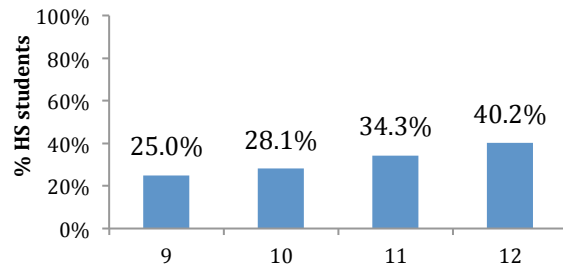
## Tobacco Chewing

31.7% of high school students in FSM are current tobacco chewers (chewed tobacco in the past 30 days). This includes chewing tobacco with or without betel nut.

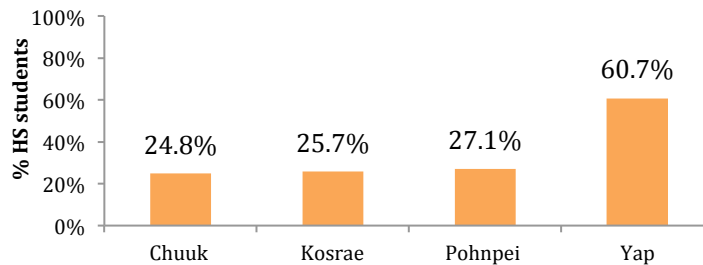
**Tobacco chewing in the past 30 days among FSM HS students, by gender, 2017**



**Tobacco chewing in the past 30 days among FSM HS students, by grade, 2017**



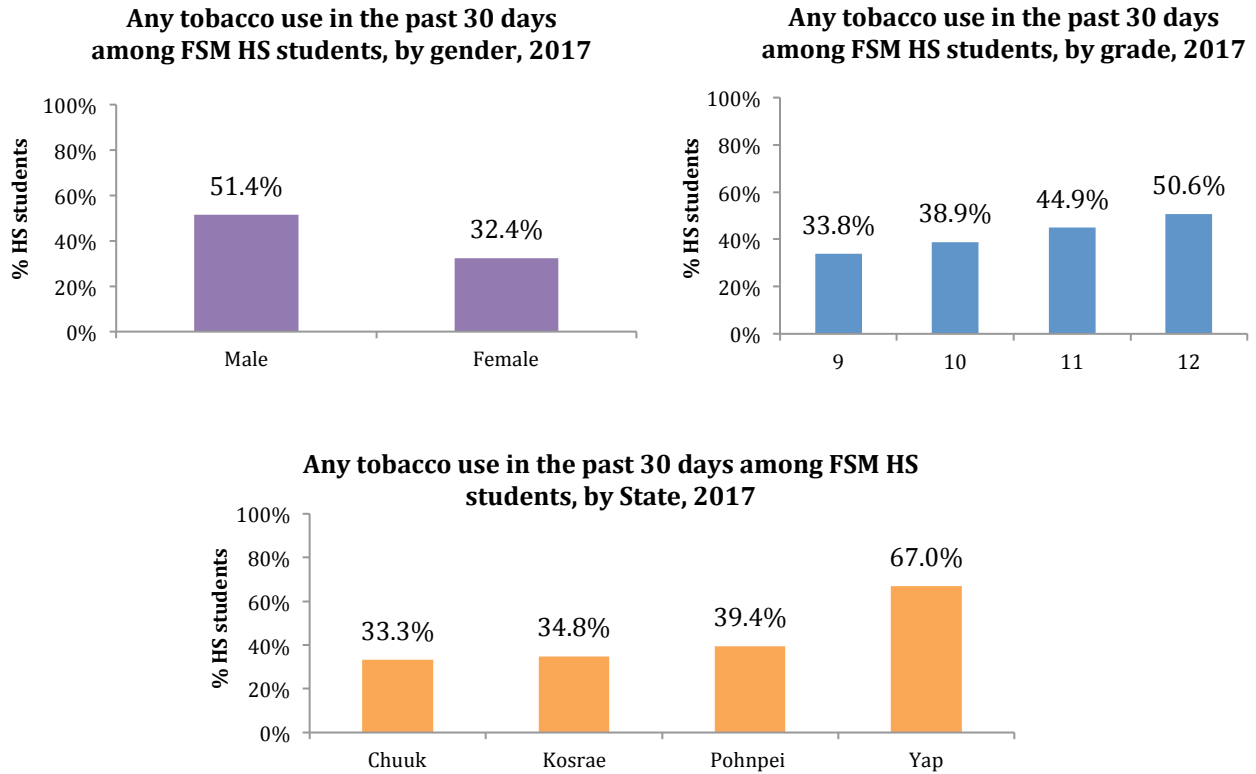
**Tobacco chewing in the past 30 days among FSM HS students, by State, 2017**



Male students have a tobacco chewing prevalence 1.5 times as high as the female prevalence (37.8% vs. 25.6%). Tobacco chewing increases by grade, reaching 40.2% by 12<sup>th</sup> grade. Tobacco chewing prevalence is fairly consistent at about 25% across Chuuk, Kosrae, and Pohnpei, but is much higher in Yap at 60.7%.

## Any Tobacco Use

Two out of five (41.8%) of all high school students in FSM are current tobacco users (smoked tobacco or chewed tobacco in the past 30 days).

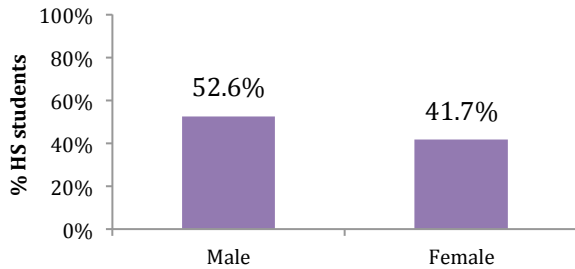


Male students have a tobacco use prevalence 1.5 times as high as the female prevalence (51.4% vs. 32.4%). Tobacco use increases by grade, reaching 50.6% by 12<sup>th</sup> grade, which means that at least half of youth coming out of high school are using tobacco. Tobacco use prevalence is lowest in Chuuk and Kosrae, and highest in Yap at 67.0%.

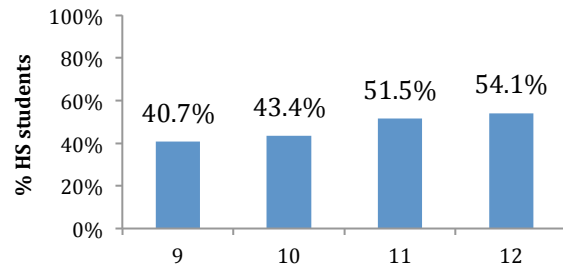
## Betel Nut Chewing

About half (47.2%) of high school students in FSM are current betel nut chewers (chewed betel nut in the past 30 days).

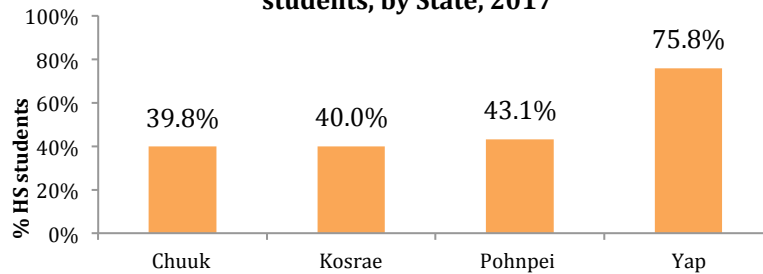
**Betel nut chewing in the past 30 days among FSM HS students, by gender, 2017**



**Betel nut chewing in the past 30 days among FSM HS students, by grade, 2017**



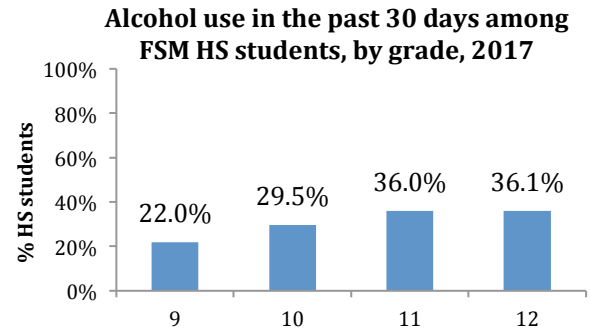
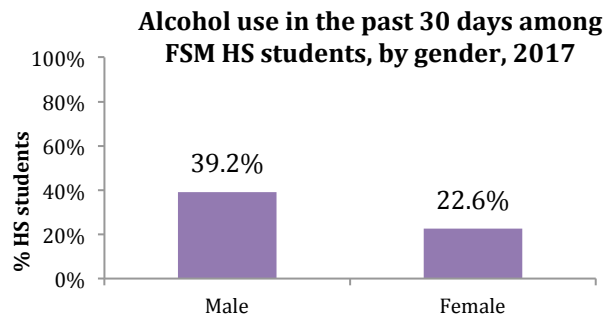
**Betel nut chewing in the past 30 days among FSM HS students, by State, 2017**



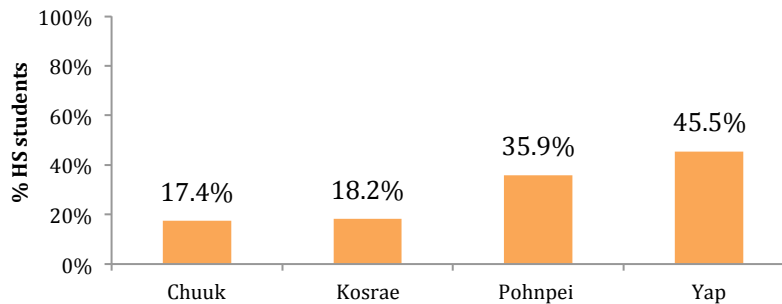
Betel nut chewing prevalence is only slightly higher among male students (52.6%) compared to female students (41.7%). Betel nut chewing prevalence increases by grade, reaching 54.1% by 12<sup>th</sup> grade. However, it should be noted that two out of five (40.7%) 9<sup>th</sup> graders are already using betel nut. Betel nut use prevalence is fairly consistent around 40% across all states with the exception of Yap where the prevalence is much higher at 75.8%.

## Alcohol Use

About one-third (30.7%) of high school students in FSM have used alcohol in the past 30 days.



**Alcohol use in the past 30 days among FSM HS students, by State, 2017**

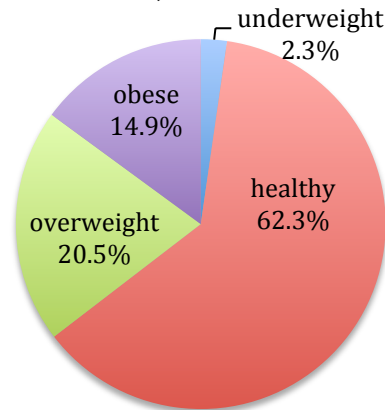


Alcohol use prevalence is about twice as high among male students (39.2%) compared to female students (22.6%). Alcohol prevalence increases with grade. Among 12<sup>th</sup> graders, 36.1% are using alcohol. Alcohol use prevalence is lowest in Chuuk (17.4%) and Kosrae (18.2%), followed by Pohnpei (35.9%), then highest in Yap (45.5%).

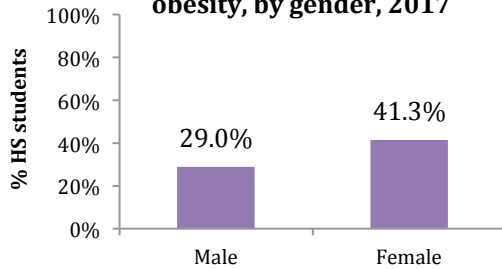
## Overweight/Obesity

Over one-third (35.4%) of high school students in FSM are overweight or obese.

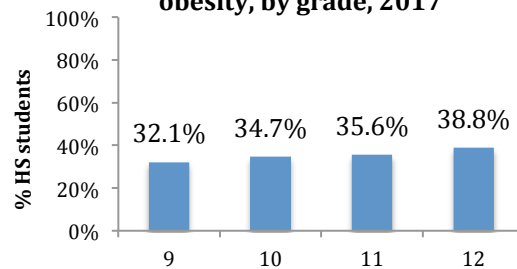
**Body Mass Index (BMI) Categories of FSM HS students, 2017**



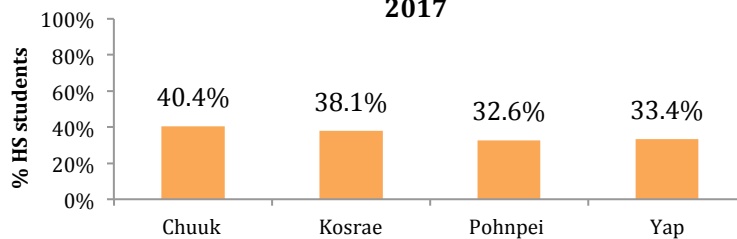
**FSM HS student overweight/obesity, by gender, 2017**



**FSM HS student overweight/obesity, by grade, 2017**



**FSM HS student overweight/obesity, by State, 2017**



Prevalence of overweight/obesity is higher among female students (41.3%) compared to male students (29.0%). Overweight/obesity increases slightly by grade. By 12<sup>th</sup> grade, almost two out of five (38.8%) of students are overweight or obese. Overweight/obesity prevalence is highest in Chuuk (40.1%) and Kosrae (38.1%), followed by Yap (33.4%) and Pohnpei (32.6%).

## Discussion

Based on the data presented in this report, it is clear that many risk factors are highly prevalent among youth in FSM. This is the first report with the first high school data to ever be collected and combined across all four FSM States, so we therefore cannot yet assess trends. However, it is clear that **there is a need to evaluate current efforts regarding substance use, physical activity, and nutrition among youth based on comparisons to the US, Guam, and CNMI.**

Tobacco use through smoking and chewing (most often with betel nut) is a significant concern given that these prevalence rates are higher than other jurisdictions in the region and **over 40% of youth are currently using some form of tobacco and almost 50% are chewing betel nut.** Additionally, **over 30% of youth are using alcohol.** There is use of all substances as young as 9<sup>th</sup> grade, indicating a need for early intervention prior to high school. Finally, substance use is higher among male students for all substances, highlighting the need to consider certain interventions specifically focused on male youth.

**Over one-third of high school youth in FSM are overweight or obese.** This high prevalence indicates the need for high-impact action through evidence-based policies and interventions. Due to the fact that youth who are overweight or obese in adolescence are more likely to be overweight or obese in adulthood compared to healthy weight youth, it is important to prevent overweight/obesity in high school students by implementing school programs and environmental policies early in childhood. Physical activity programs in schools, sports programs, school nutrition, and healthy school food policies are effective ways to prevent overweight/obesity among youth. Additionally, overweight/obesity is higher among female students, highlighting the need to consider certain interventions focused on female youth.

## Recommendations

Overall, these State-level surveys collected much needed data from FSM high school youth. It is highly recommended that **these surveys continue to be conducted on a regular, biannual basis**. It is also recommended that all indicators be collected more consistently across all four states. Specifically, height and weight should be measured in all four states for a more accurate calculation of BMI. Additionally, improvements could be made to data collection and entry to improve completeness and organization of these data. Finally, some youth in FSM are not in high school, so it should be noted that these youth are not captured in this current surveillance system. Due to the fact that these youth generally have higher substance use rates, it is very likely that the substance use prevalence data reported here are underestimated.

The data presented in this report should be **disseminated to a wide audience of stakeholders to include school administration, parent-teacher groups, and other community groups**. Additionally, state-specific reports are available for these stakeholders with a breakdown of risk factors by school. These data can hopefully encourage local efforts to reduce NCD risk factors among FSM youth.

**High school programs around substance use, nutrition, and physical activity should be strategically evaluated.** Additionally, state-level and FSM National policies regarding these topics should also be reviewed. These data can be a powerful asset to motivate higher-level change, especially regarding tobacco, alcohol, and unhealthy food legislation that have potential to greatly reduce risk factor prevalence among youth in FSM. **Without high-impact action, these risk factors will rise** among youth, and continue into adulthood, resulting in high adult risk factor and disease prevalence that greatly contribute to morbidity and mortality in FSM and burden the healthcare system.

## Acknowledgements


We humbly thank the following people for their support in the preparation of this report: Magdalena Walter, Secretary DHSA, State Directors; Kapille Capelle, Julio Marar, Livingston Taulung, and Martina Reichhardt.

Special thanks to Dr. Haley Cash for all the hard work in finalizing and preparing the report. We also want to thank our developing partners (CDC, PIHOA, WHO, SPC), regional partners and our local partners (states NCD teams) and National partners (National NCD teams) for their time and shared resources.

Our utmost gratitude is extended to the states and national leadership for their continuous support in this endeavor. Without your leadership and support the implementation of the FSM Surveillance Plan would not have been materialized.

Above all, we thank our Creator for His provision of life upon our people and our islands.

Kalahngan, Kinisou, Kamagar, Kulo and Thank you!

 5/25/19  
Magdalena Walter  
Secretary, Department of Health and Social Affairs