



# Kosrae Rapid Youth Survey

2021 Report

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March 16, 2022

Lenwo and Greetings,

On behalf of the leadership of Dept. of Health Services and Kosrae Community Health Center, let me extend my acknowledgement to all staff and partners who had contributed in one way or another to support the 2021 Kosrae NCD Core Risk Survey.

Survey results are showing improvements in tobacco and betelnut chewing rates whereas e-cigarette use is alarming. It further presents that rates of smoking, overweight and obesity are decreasing but not of statistical significance. It might be safe to think that some of our preventive strategies are effective, yet we still have this NCD fight to combat with and protect our youths from becoming victims in later adulthood.

In closing, DHS fully agrees that all efforts should be maximized to address these risk factors starting from the individual to the community, state and national level.

Kulo,

Kun K. Mongkeya  
Acting Director  
Department of Health Services  
Kosrae State, FM 96944

## 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 Kosrae. 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 Kosrae youth through the development of targeted evidence-based interventions. The table below compares selected comparable indicators in Kosrae 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>Kosrae</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)	23.5 (19.5-27.9)	11.9 (19.5-14.8)	10.8 (9.6-12.0)	6.0 (5.0-7.2)
Tobacco chewing (within past 30 days)	19.7 (16.0-23.8)	11.4 (8.8-14.7)	16.1 (14.7-17.5)	3.8 (3.2-4.6)
E-cigarette use (within past 30 days)	15.8 (12.5-19.7)	35.2 (30.0-40.8)	13.7 (12.1-15.4)	32.7 (30.7-34.8)
Alcohol use (within past 30 days)	11.6 (8.7-15.1)	25.3 (21.3-29.8)	25.3 (21.3-29.8)	29.2 (27.3-31.2)
<b>Overweight/obesity</b>				
Had obesity	15.0 (11.7-18.7)	23.8 (20.9-26.9)	21.6 (20.1-23.2)	15.5 (13.8-17.5)
Were overweight	20.0 (16.2-24.1)	18.3 (15.7-21.2)	15.9 (14.5-17.3)	16.1 (14.9-16.6)

\*Guam, CNMI, and US data are from the 2019 YRBS because 2021 data were not available when this report was developed.

## Youth Surveillance in Kosrae

The Rapid Youth High School Survey in Kosrae can inform us about the current prevalence of key NCD risk factors, as well as tell us about trends. These trends are important because they tell us whether or not our current efforts are effective at improving risk factor indicators among youth.

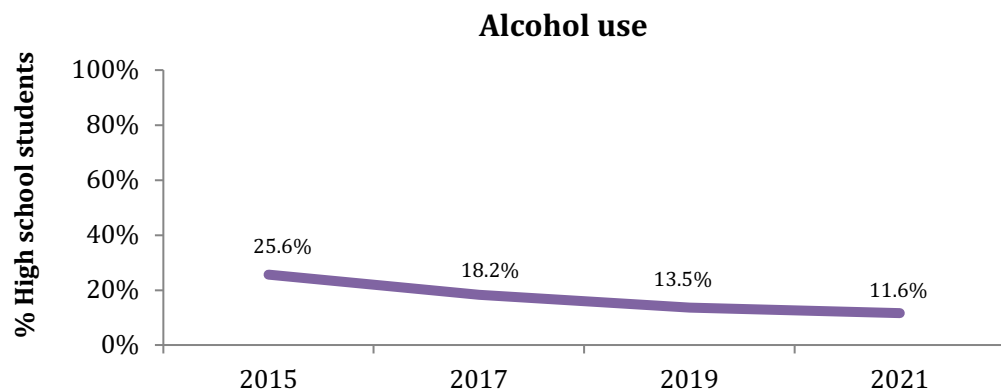
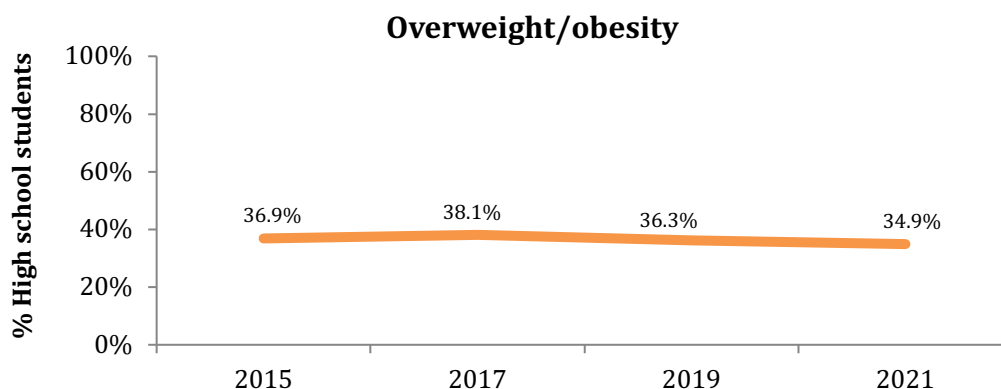
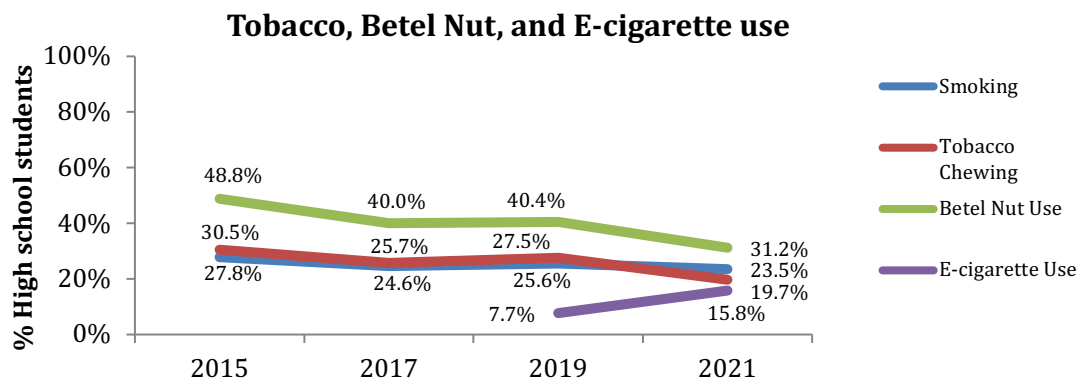
When we compare the 2019 Kosrae Rapid High School Survey data to the current 2021 data, we see that there was not a significant change in smoking prevalence. Although tobacco chewing and betel nut chewing prevalence both significantly decreased, e-cigarette prevalence significantly increased. This suggests that youth in Kosrae may be shifting from betel nut chewing with tobacco to e-cigarette use. Although there was a slight decrease in both alcohol use and overweight/obesity prevalence, these changes were not statistically significant.

	2019%	2021%	Comparison*
<b>Smoking (within past 30 days)</b>	25.6	23.5	○
<b>Tobacco chewing (within past 30 days)</b>	27.6	19.7	↓
<b>Betel nut chewing (within past 30 days)</b>	40.4	31.2	↓
<b>E-cigarette use (within past 30 days)</b>	7.7	15.8	↑
<b>Alcohol use (within past 30 days)</b>	13.2	11.6	○
<b>Overweight/obesity</b>	36.3	34.9	○

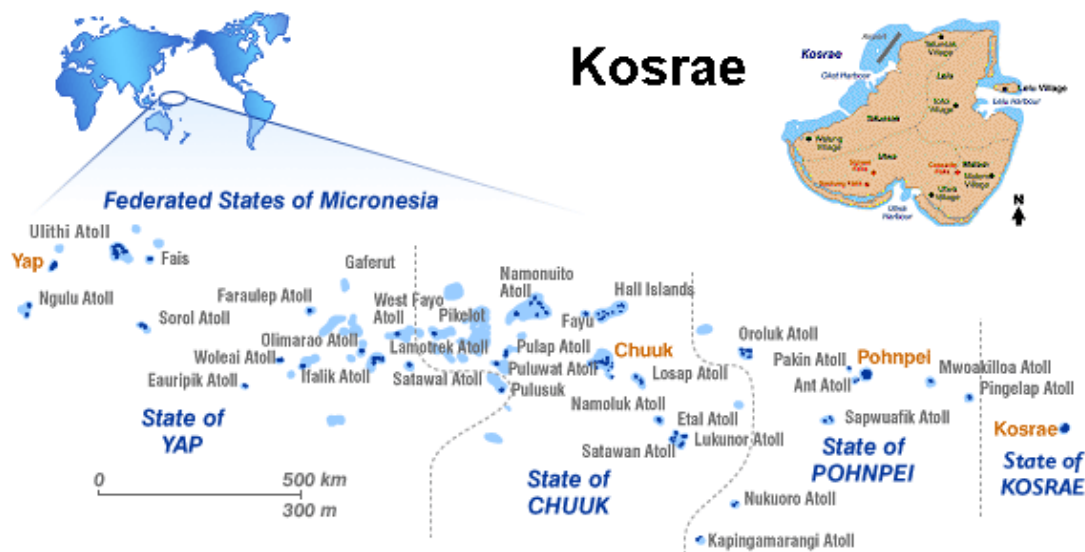
\*Chi-square tests were used to test for statistically significant differences between 2019 and 2021; p-values<0.05 were considered statistically significant; ↓= indicator got significantly better from 2019 to 2021; ↑=indicator got significantly worse from 2019 to 2021; ○= indicator showed no significant change from 2019 to 2021.

## Youth Surveillance in Kosrae

Below you will find six-year trends from 2015-2021. There was an overall downward trend in smoking, chewing tobacco, and betel nut use from 2015 to 2021, though there was a steep increase in e-cigarette use from 2019 to 2021 (data not collected on e-cigarette use between 2015-2017). Alcohol use prevalence has also continued to decline since 2015. Overweight/obesity prevalence remains fairly stagnant over time.



## Background



### Figure 1. Map of Kosrae

Source: <https://scubadivingresource.com/destinations/pacific-south-pacific/micronesia/kosrae/>

Kosrae is one of the four states of the Federated States of Micronesia (FSM) located in the Pacific Ocean east of the Philippines. Kosrae is made up of one single island with a total land area of 42 square miles. As of 2010, the total population of Kosrae was 6,616, making it the least populated state in FSM.

In 2012, Kosrae State 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 Kosraeans. The majority of the adult population in Kosrae is now overweight or obese and use of betel nut (generally with tobacco) has recently become common.

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, Kosrae adopted the Kosrae Rapid Youth High School Survey beginning in 2015 to be implemented biannually.



## Methodology

The Kosrae Rapid Youth High School Survey was developed by the Kosrae State Department of Health Services (Kosrae DHS) with assistance from PIHOA (see Annex for copy of the survey). This survey instrument collects data on core youth NCD indicators (30-day smoking, tobacco chewing, betel nut chewing, e-cigarette use, and alcohol use and overweight/obesity). The Kosrae Rapid High School Youth Survey is conducted at the only high school in Kosrae (Kosrae High School). All students in grades 9-12 present on the survey day are eligible to participate in the survey.

The Kosrae CHC in collaboration with DHS staff spearheaded the 2021 survey at Kosrae High School from November 1-5, 2021. Prior to data collection, all staff were trained on survey administration to include physical measurements of height and weight. Kosrae Survey 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. Afterwards, Kosrae Survey staff entered the paper surveys into a Microsoft Excel database. PIHOA provided technical support for cleaning and analyzing these data.

Data on substance use are all based on self-report. Measured height and weight were used to calculate Body Mass Index (BMI). BMI percentiles were used to determine BMI categories for those students under 17 years old. Adult BMI calculations were used for those students 18 and older. Overall, all students were classified as underweight, healthy, overweight, or obese.

There were a total of 467 students on the Kosrae High School (KHS) roster for the 2021-2022 school year. There were a total of 421 complete surveys, so the



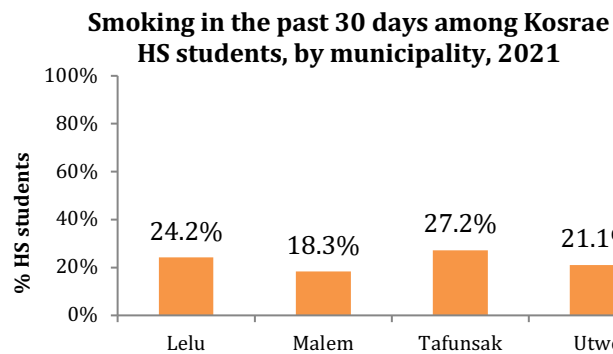
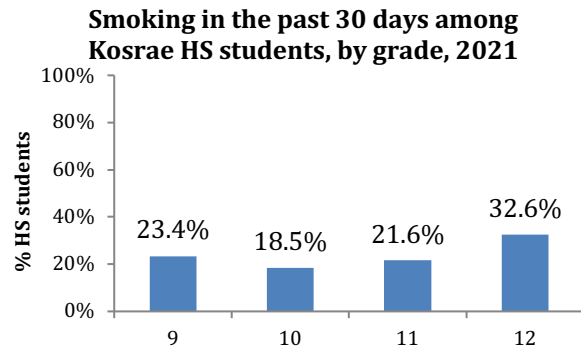
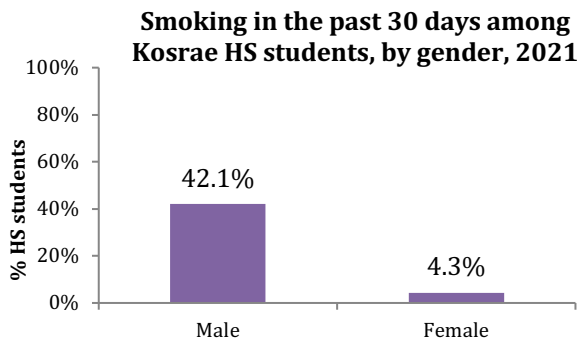
response rate was 90%. Students who did not participate were absent on the days of surveying.

### **Sample Characteristics (N=421)**

<b><u>Demographic Characteristics</u></b>	<b>N</b>	<b>%</b>
<b>Gender</b>		
Male	214	50.8%
Female	207	49.2%
<b>Age</b>		
13-14	84	20.0%
15-16	210	49.9%
17-18	113	26.8%
19+	14	3.3%
<b>Grade</b>		
9	94	22.3%
10	130	30.9%
11	102	24.2%
12	95	22.6%
<b>Municipality</b>		
Lelu	149	35.4%
Malem	60	14.3%
Tafunsak	136	32.3%
Utwé	71	16.9%
Walung	5	1.2%
<b>Total</b>	<b>421</b>	<b>100.0%</b>

## Smoking

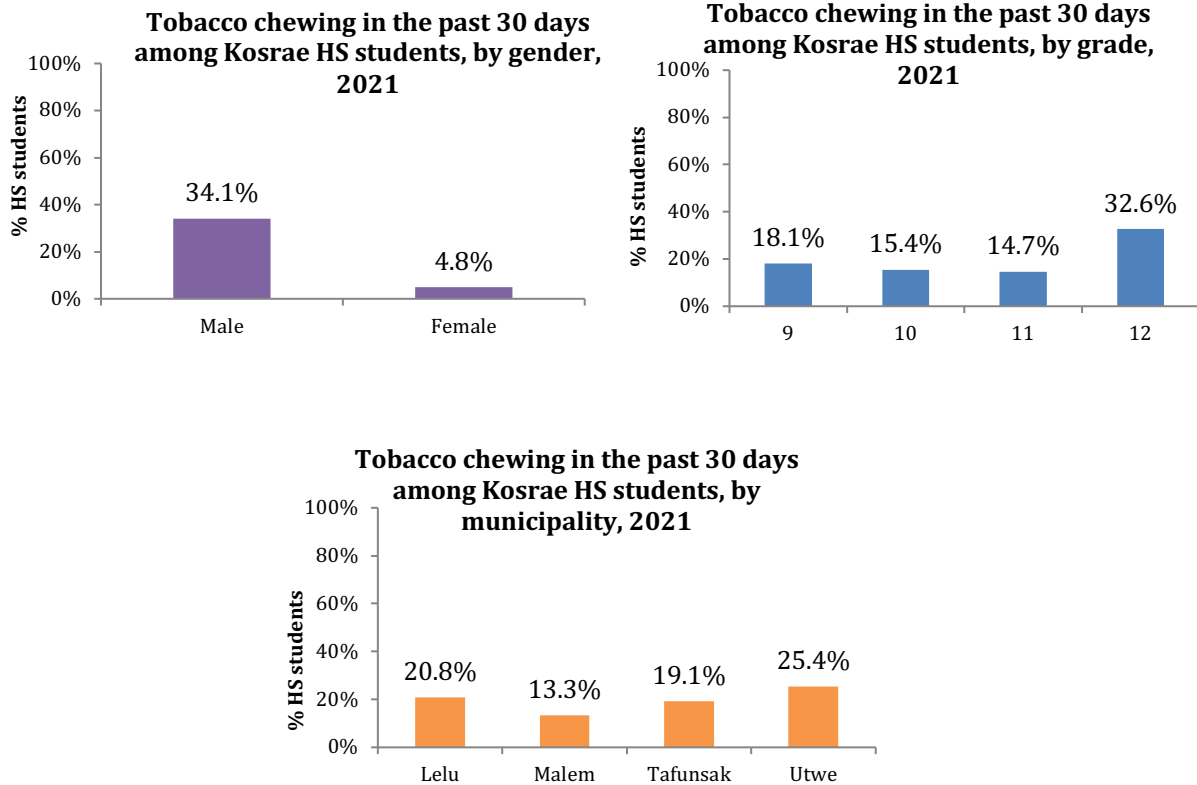
23.5% of high school students in Kosrae are current smokers (smoked in the past 30 days).



Male students have a smoking prevalence almost ten times higher than female students (42.1% vs. 4.3%). Smoking prevalence is highest among 12<sup>th</sup> graders at 32.6%. There also appears to be some variation by municipality ranging from 18.3% in Malem to 27.2% in Tafunsak.

## Tobacco Chewing

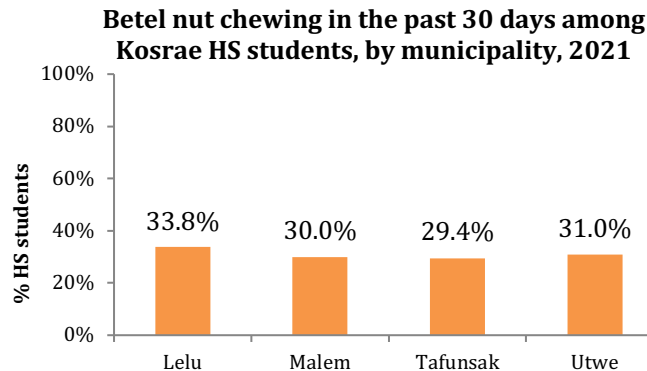
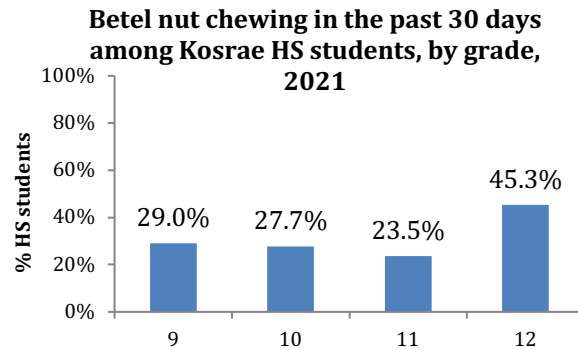
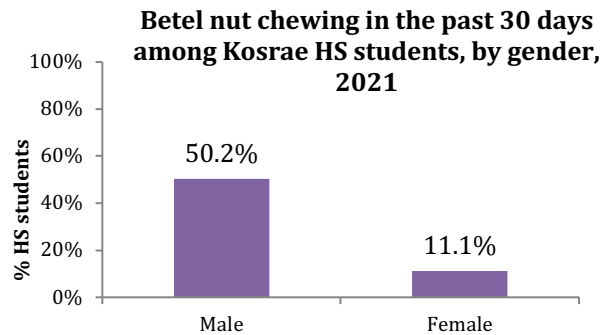
19.7% of high school students in Kosrae are current tobacco chewers (chewed tobacco in the past 30 days). This includes chewing tobacco with or without betel nut.



Male students have a tobacco chewing prevalence seven times higher than the female prevalence (34.1% vs. 4.8%). Tobacco chewing is highest among 12<sup>th</sup> graders at 32.6%. There is some variation in tobacco chewing by municipality ranging from 13.3% in Malem to 25.4% in Utwe.

## Betel Nut Chewing

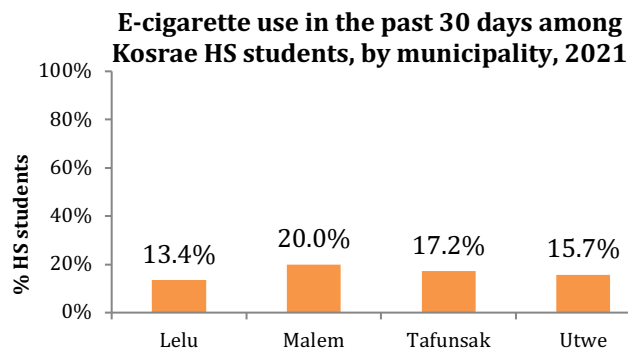
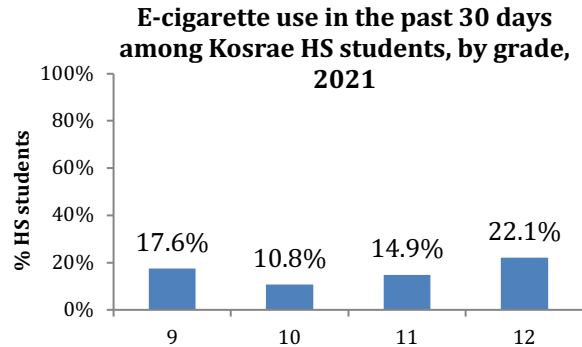
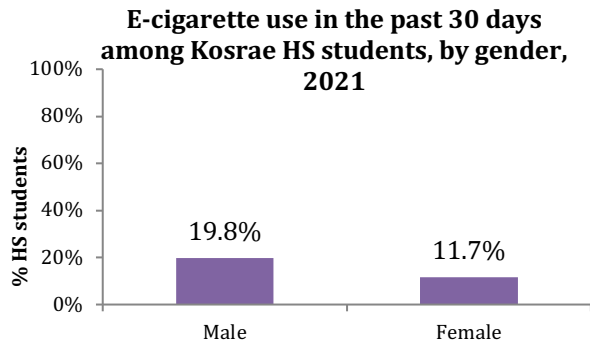
One out of three (31.0%) high school students in Kosrae are current betel nut chewers (chewed betel nut in the past 30 days).



Betel nut chewing prevalence is almost five times higher among male students (50.2%) compared to female students (11.1%). Betel nut chewing prevalence increases almost two-fold from 11<sup>th</sup> graders to 12<sup>th</sup> graders with almost half (45.3%) of 12<sup>th</sup> graders chewing betel nut. However, it should be noted that one-quarter (29.0%) of 9<sup>th</sup> graders are already using betel nut. Betel nut chewing prevalence is similar across all municipalities (about one in three students).

## E-Cigarette Use

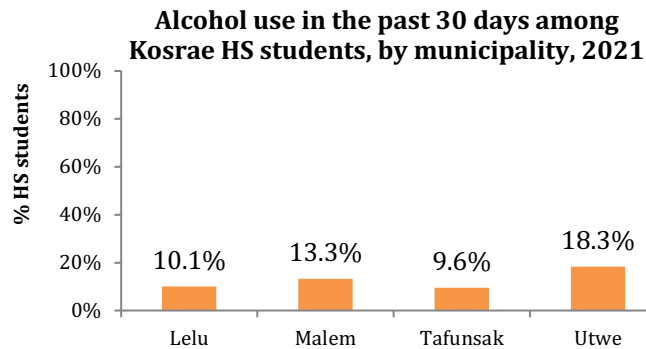
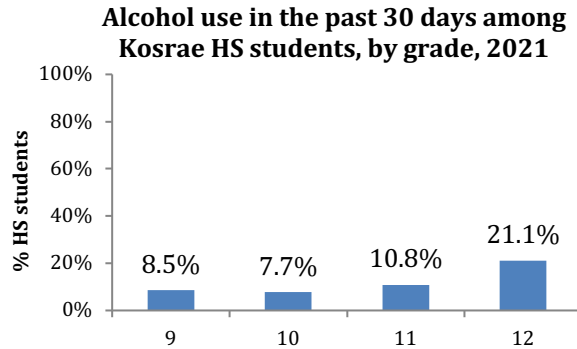
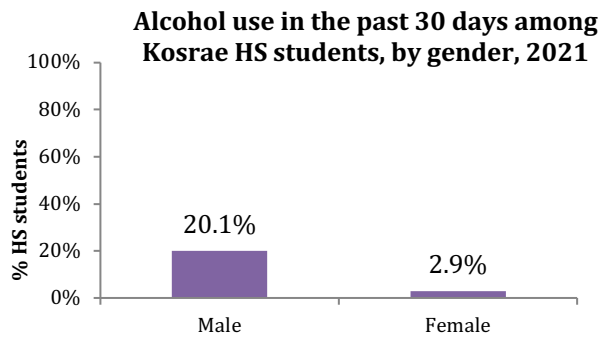
15.8% of high school students in Kosrae are current e-cigarette users (used e-cigarettes in the past 30 days). This prevalence doubled from 2019 (7.7%).



E-cigarette use is almost twice as high among male students (19.8%) compared to female students (11.7%). However, it should be noted that e-cigarettes are the substance with the highest prevalence among female students and this prevalence increased greatly from 2019 (3.5%). E-cigarette use prevalence is highest amongst 10<sup>th</sup> graders at 20.0%. E-cigarette use prevalence varies slightly by municipality ranging from 13.4% in Lelu to 20.0% in Malem.

## Alcohol Use

11.6% of high school students in Kosrae have used alcohol in the past 30 days.

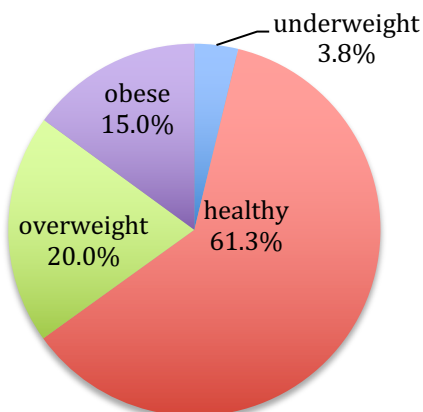


Alcohol use prevalence is seven times higher among male students (20.1%) compared to female students (2.9%). Alcohol use prevalence increases with grade with 21.1% of 12<sup>th</sup> graders currently using alcohol. Alcohol use prevalence varies slightly by municipality with the highest prevalence in Utwe at 18.3%.

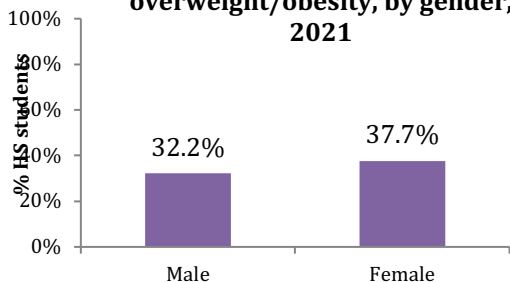
## Overweight/Obesity

Over two-thirds (34.9%) of high school students in Kosrae are overweight or obese.

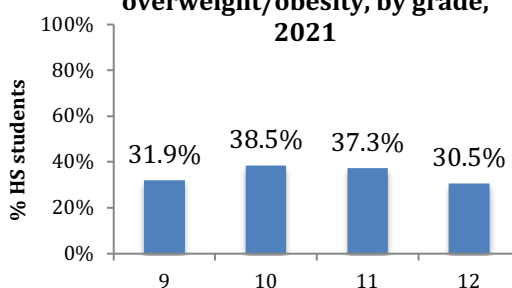
**Body Mass Index (BMI) Categories of Kosrae HS students, 2021**



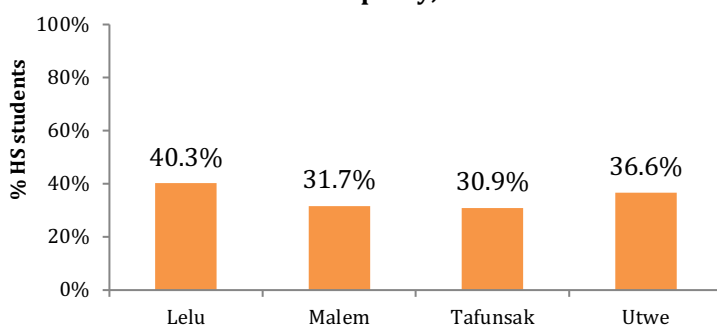
**Kosrae HS student overweight/obesity, by gender, 2021**



**Kosrae HS student overweight/obesity, by grade, 2021**



**Kosrae HS student overweight/obesity, by municipality, 2021**



Prevalence of overweight/obesity is higher among female students (37.7%) compared to male students (32.2%). Overweight/obesity was highest among 10<sup>th</sup> and 11<sup>th</sup> graders at 38.5% and 37.3%, respectively. Overweight/obesity prevalence varied slightly by municipality ranging from 40.3% in Lelu to 36.6% in Utwe.



## Discussion

Based on the data presented in this report, it is clear that many non-communicable disease risk factors are highly prevalent among youth in Kosrae. Although, it appears as if alcohol use prevalence is decreasing among youth in Kosrae. However, smoking, tobacco chewing, betel nut use, and overweight/obesity prevalence remains high. This indicates a need to build upon current efforts regarding alcohol use prevention in youth, while reevaluating efforts regarding tobacco, betel nut, and youth physical activity and nutrition.

Tobacco use through smoking and chewing (with betel nut) is a significant concern given that these prevalence rates are higher than other jurisdictions in the region and **two out of five high school youth are chewing betel nut, mostly with tobacco added**. Although tobacco use via smoking and chewing decreased between 2019 and 2021, **the prevalence of e-cigarette use doubled over two years, and among female students it is the most reported substance used**. Although alcohol use is lower than other jurisdictions in the region, prevalence is quite high among male students and those in 12<sup>th</sup> grade. There is use of all substances as young as 9<sup>th</sup> grade, indicating a need for early intervention prior to high school.

**Over two-thirds of high school youth in Kosrae are overweight or obese and this is not improving.** 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 adolescents, it is important to prevent overweight/obesity in high school students. Physical activity programs in schools, sports programs, school nutrition, and healthy school food policies are effective ways to prevent overweight/obesity among youth.

## Recommendations

Overall, the Kosrae Rapid High School Survey continues to collect much needed data from Kosrae high school youth. It is highly recommended that **this survey continue to be conducted on a regular, biannual basis**.

**High school programs around nutrition and physical activity should be strategically evaluated.** Additionally, Kosrae State 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 Kosrae. **The rapid uptick in e-cigarette use is quite alarming and requires further investigation and action.** Evidence-based interventions will be necessary to combat e-cigarette use in Kosrae. **Without high-impact action, these risk factors will continue to rise** among youth, and continue into adulthood, resulting in high adult risk factor and disease prevalence that greatly contribute to morbidity and mortality in Kosrae and burden the healthcare system.

## Acknowledgements

- **Kosrae Department of Health Services**
  - Kun Mongkeya, Acting Director
  
- **Kosrae Community Health Center**
  - Nena Tolenoa, Chief Executive Officer
  - Dr. Tholman Alik, Medical Director
  
- **Department of Education**
  - Dr. Tulensru Waguk, Director
  - Scott Nena, KHS Principal
  
- **NCD Core Risk Survey Team 2021**
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  - Tulpe R. Timothy
  - William K. William – Data Support
  - Berkley Andrew
- 
- **Dr. Haley Cash**, Regional NCD Epidemiologist, PIHOA
  - **Kosrae High School Students SY 2021 – 2022**

## Annex

Students will first be interviewed and measured by trained NCD Survey Staff to complete questions 1-11 in the shaded box. Then, students will complete questions independently, and then submit forms into a designated box. **No names are to be collected.**

### **SECTION 1: To be completed by NCD Survey Staff:**

<b>1. Date (M/D/Y):</b>	____/____/____
<b>2. Name of School:</b>	_____
<b>3. Grade:</b>	<div style="display: flex; justify-content: space-around; align-items: center;"> <span><b>9</b></span> <span><b>10</b></span> <span><b>11</b></span> <span><b>12</b></span> <span><b>(circle one)</b></span> </div>
<b>4. Name of Class or Section:</b>	_____
<b>5. Gender:</b>	<div style="display: flex; justify-content: space-around; align-items: center;"> <span><b>Male</b></span> <span><b>Female</b></span> <span><b>(circle one)</b></span> </div>
<b>6. Age (years)</b>	_____ years
<b>7. Residence (Municipality):</b>	_____
<b>8. Staff Member Initials:</b>	_____

<b>9. Height:</b>	_____ cm
<b>10. Weight:</b>	_____ kg
<b>11. Staff Member Initials:</b>	_____

### **SECTION 2: To be completed by Student after SECTION 1:**

**This section is for the student to complete** (Do not put your name on this sheet. All information is confidential.)

- |  |     |    |              |
|--|-----|----|--------------|
| 1. During the <b>past 30 days</b> , did you <b><u>smoke</u></b> any tobacco?   | Yes | No | (circle one) |
| 2. During the <b>past 30 days</b> , did you have <b><u>at least one drink of alcohol</u></b> ?   | Yes | No | (circle one) |
| 3. During the <b>past 30 days</b> , did you chew <b><u>at least one betel nut</u></b> ?  | Yes | No | (circle one) |
| 4. During the <b>past 30 days</b> , did you <b><u>chew</u></b> any tobacco (with or without betelnut)?   | Yes | No | (circle one) |
| 5. During the <b>past 30 days</b> , did you <b><u>use any electronic vapor products including e-cigarettes, vapes, vape pens, e-cigars, ehookahs, hookah pens, and mods.</u></b> | Yes | No | (circle one) |