DEPARTMENT OF PUBLIC HEALTH AND SOCIAL SERVICES

GUAM COMMUNITY HEALTH ASSESSMENT 2022

A Collaborative Effort by the Department of Public Health and Social Services and Community Stakeholders

GOVERNMENT OF GUAM
DEPARTMENT OF PUBLIC HEALTH AND SOCIAL SERVICES
DIPATTAMENTON SALUT PUPBLEKO YAN SETBISION SUSIAT

LOURDES A. LEON GUERRERO
MAGA'HÅGAN GUÅHAN
GOVERNOR OF GUAM

JOSHUA F. TENORIO
SEGUNDO MAGA'LÅHEN GUÅHAN
LT. GOVERNOR OF GUAM

THERESA C. ARRIOLA, MBA
DIRECTOR

PETERJOHN D. CAMACHO, MPH
DEPUTY DIRECTOR

AMANDA LEE SHELTON, MPA
DEPUTY DIRECTOR

SEP 0 5 2025

Hafa Adai!

In 2014, the Department of Public Health and Social Services completed its first Guam Community Health Assessment (CHA), using a collaborative process of systematically collecting relevant data on the health of our community. The process involved engaging with key stakeholders and collecting and analyzing data to identify what health concerns existed in the community.

In 2019, DPHSS began preparing for the second CHA. During this period, the DPHSS facility in Mangilao experienced an electrical fire which jeopardized data retrieval pertaining to key health indicators. The COVID-19 pandemic restrictions also played a factor in the planning process. These two significant events affected the way in which the CHA was conducted and instead of in-person community workshops and face-to-face dialogue, Dr. Annette M. David of Health Partners, L.L.C., conducted the CHA using electronic platforms.

The CHA 2020 survey results revealed progress made in several areas, such as teen pregnancy rates and youth safe sex behaviors, smoking and lung cancer incidence, binge drinking among youth, better flu vaccine uptake and lower cardiovascular and diabetes mortality. Additionally, food security, which was not identified in 2014, emerged as a priority.

The health priorities identified in the 2014 and 2020 CHA are listed below. Both assessments can be accessed on the Department of Public Health and Social Services website at www.dphss.guam.gov

2014 Health Priorities	2020 Health Priorities
High prevalence of unsafe sex and sexually transmitted diseases	NCD prevention and control
Other risk-taking behavior, particularly marijuana use and riding in a vehicle with a driver who had been drinking alcohol, among youth	COVID-19 pandemic
High prevalence of tobacco use, especially among adults	Health system infrastructure and access
Low vaccine utilization and high incidence and prevalence of vaccine-preventable illnesses, such as influenza, pneumococcal pneumonia, measles, mumps and varicella	Mental health and suicide prevention

High incidence of lung and cervical cancer	Substance abuse and drug addiction
High incidence of tuberculosis	Health care financing and insurance coverage
Inadequate health system infrastructure, with insufficient number of hospital beds per capita and insufficient health workforce per capita	Domestic violence
Low uptake of cancer screening	Food security
High diabetes and cardiovascular mortality	Tobacco and e-cigarette use
High rates of suicide, especially among youth	Health promotion and education

THERESA C. ARRIOLA, MBA
Director

Table of Contents

Acknowledgements

This report resulted from the collaborative efforts of the various divisions and programs that comprise the Guam Department of Public Health and Social Services (DPHSS) and numerous community stakeholders. DPHSS contracted with Dr. Annette M. David to facilitate the analysis and to serve as lead author for this report.

The data contained in this profile were contributed by the members of the DPHSS Community Health Assessment (CHA) Core Planning Team working with Dr. David, using primary and secondary sources within each program/division as well as existing population surveillance instruments such as the Behavioral Risk Factor Surveillance System (BRFSS) and the Youth Risk Behavior Surveillance System (YRBSS). Ms. Bertha A. Taijeron, Program Coordinator IV, Ms. Mathi G. Matthews, Program Coordinator IV, and Ms. Patricia Lee, Public Health Associate, provided project coordination and administrative support, under the leadership of DPHSS Director Arthur U. San Agustin, MHR.

The key findings resulting from the creation of this report have been presented to several community stakeholders for their review and feedback using online platforms. Once the COVID-19 restrictions in Guam are lifted, wider dissemination through town hall meetings and in-person workshops and presentations are planned.

This publication was supported by the FY 2019 and 2021 Preventive Health and Health Services Block Grant (PHHSBG) (FY 2019 PHHSBG: 1 NB01OT009305-01-00; FY 2021 PHHSBG: 1 NB01OT009431-01-00) from the United States Centers Disease Control and Prevention (CDC). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the CDC.

Suggested citation:

David AM, on behalf of the Guam CHA Planning Team and Community Stakeholders. *Guam Community Health Assessment 2022.* Mangilao, Guam: Guam Department of Public Health and Social Services; February 10, 2022.

Executive Summary

The Guam Department of Public Health and Social Services (DPHSS) started the process to conduct its first Community Health Assessment (CHA) in 2010. After laying the groundwork and engaging community partners, from 2010 to 2012, data collection and analysis and the prioritization of critical health issues occurred in 2013. The Guam CHA utilized a community-based participatory process throughout, using a mix of internal consultations within the divisions and programs of DPHSS and external consultations with other agencies and community partners.

In 2014, following a process of successive internal and external consultations, and community dialogue, the following ten critical health issues were identified, in order of importance:

- High prevalence of unsafe sex and sexually transmitted diseases
- Other risk-taking behavior, particularly marijuana use and riding in a vehicle with a driver who had been drinking alcohol, among youth
- High prevalence of tobacco use, especially among adults
- Low vaccine utilization and high incidence and prevalence of vaccine-preventable illnesses, such as influenza, pneumococcal pneumonia, measles, mumps and varicella
- High incidence of lung and cervical cancer
- High incidence of tuberculosis
- Inadequate health system infrastructure, with insufficient number of hospital beds per capita and insufficient health workforce per capita
- Low uptake of cancer screening
- High diabetes and cardiovascular mortality
- High rates of suicide, especially among youth

The following table summarizes the progress from baseline for the relevant indicators under the ten critical health issues identified in 2014. This table used data from existing health surveillance systems, primarily the BRFSS and YRBSS supplemented with local data from various Guam agencies, published scientific articles and online sources.

Table 1. Progress over time, original community health priorities, 2011-2020

Indicator	Source Baseline	Baseline	Current	Source Current	
High prevalence of unsafe sex and sexually transmitted diseases					
% Tested for HIV, adults	2011 BRFSS	36.6%	31.4%	2020 BRFSS	
% Youth taught about HIV/AIDS	2011 YRBS	86.0%	76.1%	2019 YRBS	
% Youth sexually active	2011 YRBS	49.0%	23.9%	2019 YRBS	
% Youth with 4 or more sexual partners	2011 YRBS	12.0%	6.0%	2019 YRBS	
% Youth used condom during sex	2011 YRBS	32.5%	41.6%	2019 YRBS	
% Female youth using oral contraceptives	2011 YRBS	7.5%	10.3%	2019 YRBS	

Indicator	Source Baseline	Baseline	Current	Source Current	
HIV diagnosis rate*	2012 DPHSS data	5.7/100,000	7.8/100,000	Calculated from data in the 2019 Guam Statistical Yearbook, using projected 2019 population of 166,658	
Chlamydia incidence rate	2012 DPHSS data	644.7/100,000	738/100,000		
Gonorrhea incidence rate	2012 DPHSS data	57.5/100,000	188.4/100,000		
Syphilis incidence rate	2012 DPHSS data	17.5/100,000	15/100,000		
Birth rate	2011 DPHSS Vital Statistics	20.7 per 1000	18.3 per 1000	2019 Guam Statistical Yearbook	
Teen pregnancy rate	DPHSS data, Live births 15-19 yrs.	60.1/1000	8.5/1000	2019 Guam Statistical Yearbook	
Other risk-taking behavior, particularly marijuana use and riding in a vehicle with a driver who had been drinking alcohol, among youth					
30-day marijuana use, youth	2011 YRBS	32.0%	25.9%	2019 YRBS	
% Riding in a vehicle driven by someone who had consumed alcohol, youth	2011 YRBS	34.9%	25.9%	2019 YRBS	
Binge drinking, youth	2011 YRBS	13.6%	8.2%	2019 YRBS	
High prevalence of tobacco use, especially among adults					
Smoking prevalence, adults	2011 BRFSS	30.5%	20.0%	2020 BRFSS	
Smoking prevalence, youth	2011 YRBS	21.9%	11.9%	2019 YRBS	
Smokeless tobacco use, adults	2005 NHIS	6.9%	6.4%	2020 BRFSS	
Smokeless tobacco use, youth	2011 YRBS	14.0%	11.4%	2019 YRBS	
% Quit attempt in past year, adults	2011 BRFSS	70.0%	72.3%	2017 BRFSS	
% Quit attempt in past year, youth	2011 YRBS	68.7%	67.0%	2019 YRBS	
Low vaccine utilization and high incidence of vaccine-preventable illnesses, such as influenza, pneumococcal pneumonia, measles, mumps and varicella					
% Flu shot in past year	2011 BRFSS	39.2%	52.6%	2020 BRFSS	
% Ever had pneumonia vaccine	2011 BRFSS	39.4%	33.4%	2020 BRFSS	
% Ever had a tetanus shot	2013 BRFSS	55.3%	57.5%	2019 BRFSS	
% Ever had shingles vaccination	2014 BRFSS	12.1%	18.1%	2017 BRFSS	
% Children 19-35 mos. immunized against MMR			82.5%	2017 DPHSS data	
% Children 19-35 mos. immunized against DTaP			67.1%	2017 DPHSS data	
Hepatitis A incidence	2012 Data	13.8/100,000	135.6/100,000	Calculated from data in the 2019 Guam Statistical Yearbook, using projected 2019 population of 166,658	
Hepatitis B incidence	2012 Data	41.3/100,000	13.2/100,000		
Varicella incidence	2012 Data	31.3/100,000	10.8/100,000		
Influenza incidence	2012 Data	85.1/100,000	202.2/100,000		
Measles incidence	2012 Data	0	0		

Indicator	Source Baseline	Baseline	Current	Source Current	
Pertussis incidence	2012 Data	0.6/100,000	7.2/100,000		
Mumps incidence	2012 Data	1.9/100,000	0.6/100,000		
High incidence of lung and cervical cancer					
Lung cancer incidence (Per 100,000)	2003-2007 Cancer Registry data	85.4/100,000 males 40.6/100,000 Females	76.22/100,000 males 31.12/100,000 females	2008-2012 Cancer Registry data	
Cervical cancer incidence (Per 100,000)	2003-2007 Cancer Registry data	13.4 Females	35.8/100,000 females	Cervical cancer incidence (Per 100,000)	
High incidence of tuberculosis					
TB incidence rate	2012 DPHSS Data	41.3/100,000	47.0/100,000	2019 DPHSS data*	
Inadequate health system infrastructure, with insufficient number of hospital beds per capita and insufficient health workforce per capita					
Physician to population ratio	BSP 2011	0.98/1000	3.08/1000	Physician to population ratio	
Hospital bed to population ratio	BSP 2011	0.92/1000	2.03/1000	Hospital bed to population ratio	
% Population with insurance	2011 BRFSS	72.0%	79.3%	2020 BRFSS	
Low uptake of cancer screening					
% Women 40+ who had a mammogram in past 2 years	2010 BRFSS	64.4%	59.4%	2020 BRFSS	
% Women 50+ who had a mammogram in past 2 years	2010 BRFSS	71.4%	72.3%	2020 BRFSS	
% Women 18+ who had a pap smear within past 3 years*	2010 BRFSS	67.8%			
% Women 21-65 who had a pap smear within the past 3 years**			68.0%	2020 BRFSS	
% Adults 50+ who have had a colonoscopy/sigmoidoscopy*	2010 BRFSS	37.8%			
% Adults 50-75 who have had a colonoscopy within 10 yrs.**			37.5%	2020 BRFSS	
% Men 50+ who had prostate cancer screening*	2011 BRFSS	28.3%			
% Men 40+ who had PSA test within past 2 years**			16.1%	2020 BRFSS	
High diabetes and cardiovascular mortality					
Cardiovascular mortality rate	2011 DPHSS Vital Statistics	223.1/100,000	206.9/100,000 (2017)	2017 DPHSS Vital Statistics as reported in the 2019 Guam Statistical Yearbook	
Diabetes mortality rate		39.9/100,000	N/A***		
% Adults diagnosed with heart attack	2011 BRFSS	3.10%	4.8%	2020 BRFSS	
% Adults diagnosed with CVD	2011 BRFSS	2.80%	2.8%	2020 BRFSS	

Indicator	Source Baseline	Baseline	Current	Source Current	
% Adults diagnosed with diabetes	2011 BRFSS	9.90%	14.7%	2020 BRFSS	
High rates of suicide, especially among youth					
Suicide death rate	2012 CME data as analyzed by the Guam SEOW	15.6/100,000	23.7/100,000	2020 CME data as analyzed by the Guam SEOW	
% Youth reporting suicidal ideation	2011 YRBS	23.20%	23.8%	2019 YRBS	
% Youth with a suicide attempt	2011 YRBS	17%	16.5%	2019 YRBS	

Note: Data highlighted in **green** indicate improvement over time; data highlighted in **red** indicate worsening trend over time.

A follow-up community health assessment in 2020 had to be re-designed as a virtual survey after the onset of the COVID-19 pandemic (Annex A). A total of 812 individuals completed the survey, representing 0.5% of Guam's total population. The following ten health issues, in order of importance, emerged as the priorities in 2020, based on survey responses and corroborated by input from key community opinion leaders:

- NCD prevention and control
- COVID-19 pandemic
- Health system infrastructure and access
- Mental health and suicide prevention
- Substance abuse and drug addiction
- Health care financing and insurance coverage
- Domestic violence
- Food security
- Tobacco and e-cigarette use
- Health promotion and education

Introduction

The Public Health Accreditation Board (PHAB), a voluntary, national accreditation program for public health departments, defines a Community Health Assessment (CHA) as "a systematic examination of the health status indicators for a given population that is used to identify key problems and assets in a community. The ultimate goal of a community health assessment is to develop strategies to address the community's health needs and identified issues. A variety of tools and processes may be used to conduct a community health assessment; the essential ingredients are community engagement and collaborative participation."

In 2013, Guam embarked on its first community health assessment, using a community-based participatory approach to obtain feedback from a diverse set of stakeholders. The Department of Public Health and Social Services published and released Guam's first CHA report in 2014, with the intention of using the stakeholder input to guide strategic planning, program development and evaluation for the period 2015-2020. This is consistent with the PHAB's recommendation of utilizing the CHA as a fundamental step in the community health improvement process.

Following a process of successive internal and external consultations, and community dialogue, the following ten critical health issues were identified in 2014:

- High prevalence of unsafe sex and sexually transmitted diseases
- Other risk-taking behavior, particularly marijuana use and riding in a vehicle with a driver who had been drinking alcohol, among youth
- High prevalence of tobacco use, especially among adults
- Low vaccine utilization and high incidence and prevalence of vaccine-preventable illnesses, such as influenza, pneumococcal pneumonia, measles, mumps, and varicella
- High incidence of lung and cervical cancer
- High incidence of tuberculosis
- Inadequate health system infrastructure, with insufficient number of hospital beds per capita and insufficient health workforce per capita
- Low uptake of cancer screening
- High diabetes and cardiovascular mortality
- High rates of suicide, especially among youth

In 2019, the DPHSS started planning for a second CHA with Dr. Annette M. David of Health Partners, L.L.C., who oversaw the CHA process back in 2013. Two events significantly affected the planning process and pushed the implementation of the 2nd CHA to 2020. The first was the fire that destroyed DPHSS' central office in late 2019, which jeopardized data retrieval pertaining to key health indicators. The second was the advent of the Coronavirus pandemic in 2020. These pivotal events required a drastic adjustment in the community engagement process to determine Guam's current health priorities, shifting from in-person community workshops and face-to-face dialogue to communications using electronic platforms. Despite these challenges, this report documents the process of gathering community perceptions and feedback to provide an assessment of Guam's progress in attaining the health targets set in Healthy People 2020

across the health indicators identified in the previous CHA, identifying new and evolving health challenges affecting the island's population, and establishing an updated set of health priorities to guide community health improvement planning.

Methodology

The 2020 Guam CHA utilized a "mixed methods" approach to collect both quantitative and qualitative data, using a combination of internal consultations within the divisions and programs of DPHSS and external consultations with other agencies and community partners. Because of restrictions on public gatherings necessitated by the COVID-19 pandemic, the original plan of convening multi-stakeholder workshops and in-person key informant interviews had to be adapted to allow for virtual communications and engagement through electronic media.

Participation of representatives from a variety of state sectors

Since the original CHA in 2014, the various programs within DPHSS and their external partners have been periodically collecting, reviewing, and utilizing health data to guide public health policy and resource allocation. (See Annex B for a list of programs and community partners involved in the CHA process.) For example, data related to non-communicable diseases (NCD) and risk factors are assessed to monitor progress in NCD prevention and control by the NCD Consortium, a multi-sectoral community partnership of various organizations and individuals working to reduce NCD risk in Guam, at its annual retreat. The NCD data from the CHA process is incorporated into the NCD Consortium's strategic planning process, which has produced 2 strategic plans since the first CHA report was released.[1,2] Infectious disease data are routinely collected and analyzed by the DPHSS programs on sexually transmitted diseases (STD), human immunodeficiency virus acquired immunodeficiency syndrome (HIV/AIDS), viral hepatitis, tuberculosis (TB) and vaccine preventable diseases, and discussed with external partners to determine program priorities and resource allocation. Cancer data are closely reviewed by the Guam Comprehensive Cancer Control Coalition (GCCCC), to guide its strategic planning[3] and to produce the Guam Cancer Facts and Figures,[4] a data product released every 5 years. The Guam Diabetes Prevention and Control Program utilized CHA data to create its strategic plan[5] and subsequently, to conduct its progress assessment[6] and is incorporating relevant CHA data indicators to develop an updated strategic plan. Substance abuse, suicide and mental health data are regularly collated, analyzed, and disseminated by the Guam State Epidemiological Outcomes Workgroup (SEOW) and the Governor's Prevention Education and Community Empowerment (PEACE) Council. The SEOW meets quarterly to review data and develop recommendations for evidence-based prevention interventions. The data

[1] Mummert AG, Camacho CD and David AM on behalf of the Guam NCD Consortium. *Guam Non-communicable Disease Strategic Plan 2014-2018.* Mangilao, Guam: Department of Public Health and Social Services, December 2013.
[2] Guam NCD Consortium. Guam NCD Consortium. *Guam Non-communicable Disease Strategic Plan 2019-2023.* Mangilao, Guam: Department of Public Health and Social Services, December 2019.
[3] David AM, Alam L, Zabala RA, Grino R. *Guam Comprehensive Cancer Control Plan 2018-2022.* Mangilao, Guam: Department of Public Health and Social Services, June 2017.
[4] David AM, Mummert A, Haddock R, Bordalo R, Zabala R, Alam L. Guam Cancer Facts and Figures 2008-2012. Hagatna, Guam: Guam Department of Public Health and Social Services, 2015.
[5] Guam Diabetes Control Coalition. *2016-2020 Strategic Plan for Diabetes Prevention and Control in Guam.* Mangilao, Guam: Department of Public Health and Social Services, 2016.
[6] David AM, Bordallo G, Luces P, Almonte G on behalf of the Guam Diabetes Control Coalition. *Guam Diabetes Control Strategic Plan Evaluation.* Mangilao, Guam: Department of Public Health and Social Services, December 2019.

are used by the Guam Behavioral Health and Wellness Center (GBHWC) and the SEOW to publish a biannual Guam Epidemiological Profile (Epi Profile)[7] and an annual Guam Suicide Profile[8] (Note: The SEOW has been in existence since 2005, with quarterly meetings).

These various programs, their community partners, and health-related community organizations/coalitions contributed to the data collection and analysis reflected in this current CHA report. They are active users of the CHA data, producing various data products and integrating relevant data into their strategic planning and progress monitoring activities. Some of the data partners, including the SEOW, the GCCCC, and the Governor's PEACE Council, have continued to meet regularly (quarterly for the SEOW and PEACE Council, monthly for the GCCCC) using online platforms, despite the COVID-19 pandemic, to review and disseminate new data. CHA data are also shared periodically, and upon request, with Guam's government leaders, the Legislature, the Mayor's Council, other government agencies, and with the private sector, including the Rotary Club, the various professional organizations, and non-profits, such as the American Cancer Society Guam, Island Girl Power, etc.

To ensure representation from vulnerable groups, the various DPHSS and GBHWC programs have proactively partnered with community groups that represent high-risk populations. For example, given the significant health disparities noted within the LGBTQ community, Guam Alternative Lifestyle Association (GALA) – a non-profit advocating for the LGBTQ community – occupies a prominent place in the Guam SEOW, the Guam NCD Consortium, the Guam PEACE Council, and the STD/HIV/Viral Hepatitis partners' group. The Governor's PEACE Council includes members who have lived experience in relation to mental health and suicide risk. The Guam Homeless Coalition is represented in the circle of partners of the DPHSS Tuberculosis program. Youth and young adults are represented by both government agencies such as the Department of Youth Affairs and non-profit organizations such as Youth for Youth Live! and Island Girl Power. The military and veterans are represented in these various coalitions and councils by the Guam National Guard.

Desk review

Initially, we sought to identify and collate all relevant information in the published scientific literature, health-related publications and in media. We used a variety of search-related terms such as "health", "outbreak", "epidemiology", "infectious disease", "health emergency", "non-communicable disease", "reportable disease", "risk preparedness", "substance abuse", "surveillance", "environmental health", "public health", "mental health", "epidemic", "health system", "vital statistics", and "Guam." We used Google as the initial general search engine, but we also ran the search in various databases including PubMed, databases of the CDC, the National Institutes of Health (NIH), the World Health Organization (WHO), and various media databases. Material obtained from this search strategy were reviewed and categorized as contributing to an assessment of progress in

[7] David AM, on behalf of the Guam SEOW. *Guam State Epidemiological Profile 2018 Update*. Hagatna, Guam: Prevention and Training Branch, Guam Behavioral Health and Wellness Center; 2020.
[8] David AM, on behalf of the Guam SEOW. *Suicide in Guam 2020*. Hagatna, Guam: Prevention and Training Branch, Guam Behavioral Health and Wellness Center; 2021.

previously identified health priorities or identifying potential novel health threats that need to be incorporated into Guam's health landscape analysis.

Analysis of primary and secondary data

We reviewed core public health surveillance data, including population health surveys like the BRFSS, reportable disease surveillance, vital statistics data and demographic data from the Bureau of Statistics and Plans (BSP). At the time of writing this report, the 2020 census data for Guam had not yet been released; however, we utilized 2020 projections based on the 2010 census, as reported in the 2019 Guam Statistical Yearbook. We also looked at other data sources such as the Chief Medical Examiner's suicide database, Guam Memorial Hospital Authority (GMHA) admission data, DPHSS reportable diseases data, Guam Cancer Facts and Figures, Guam Police Department (GPD) Uniform Crime Report (UCR), GBHWC consumer data, and the SEOW Epi Profile to augment information from surveillance systems.

We utilized demographic data to delineate the social determinants of health in Guam. Health-related risk factor, disease incidence and prevalence and mortality data were analyzed in relation to four domains:

- **Magnitude** of the issue – How large is the problem within Guam?
- **Trend** over time – How is the situation changing over time?
- **Relative burden as compared to the U.S. average –** How is Guam compared to the US. in relation to the health issue?
- **Disparity** – Are there indications that the distribution of the health burden is not equitable across sex, age, ethnicity, or socio-economic status?

These data were compared to the data in the 2014 CHA report. Wherever possible, progress across the identified 2014 health indicators was gauged based on these data comparisons.

Community survey

Because of the COVID-19 pandemic, an alternative approach to the collection of community input into perceived health priorities was developed and agreed upon. Instead of face-to-face stakeholder dialogues and community workshops, we opted to utilize an online survey with a concentrated effort to obtain as large a response as possible using virtual recruiting strategies. The survey had three aims:

- To ascertain respondents' perception of the current state of their health and their family's health compared to the previous years
- To determine whether the list of 10 health priorities from 2013 were still considered to be relevant
- To identify new priorities that may have emerged in the current period

A data collection instrument was developed using Survey Monkey (Premium subscription) that included a mix of questions: multiple choice, forced ranking, and open-ended, to generate as much usable data within a relatively short online questionnaire. The questionnaire was intentionally kept brief to enhance respondent acceptability (minimizing response fatigue and loss of motivation) and to maximize the completion rate. A pilot test was conducted, and the questions were revised and refined based on the feedback generated from the pilot.

To ensure cultural and linguistic inclusion, interviews with key opinion leaders in the CHamoru, Filipino, and Micronesian communities were carried out ascertaining the need for translated versions of the survey instrument. The CHamoru and Filipino interviewees indicated that English questionnaires would suffice; however, our Micronesian informants recommended having a Chuukese version, given the relatively large proportion of the Chuukese in the Guam community who do not speak English as their first language. A Chuukese version of the questionnaire was developed, working with an official translator in the Guam district court system. An independent bilingual individual back translated the questionnaire into English, and a revised version was finalized based on the results of the back translation.

The objective was to achieve at least 500 completed surveys. Multi-pronged recruitment strategies augmented the survey's reach:

- Targeted networks: Wrote to professional and academic organizations, faith leaders, policy leaders and educational institutions to disseminate the survey within their networks.
- Community chat groups: Connected with the village mayors to post the recruitment announcement on their community chat groups.
- Social media advertising: Purchased paid advertising through Facebook.
- Personal networks: Solicited the help of key community opinion leaders to share the recruitment announcement within their personal networks.

We utilized frequency counts and descriptive statistics for categorical and multiple-choice questions. For the forced ranking questions, we calculated a net score to determine the degree of persistent relevance (or non-relevance) of the top ten health issues identified as community health priorities in 2014. Responses to the open-ended questions were classified into thematic categories using inductive coding, and descriptive statistics were applied to the codes. Textual analysis using word frequencies and word cloud were also utilized on open-ended responses.

Responses to the categorical/multiple choice questions were disaggregated by sex, age and ethnicity to elucidate any differences across groups. Cross tabulation and chi-square analysis were conducted to determine if any statistically significant differences existed across the groups at a 5% level of significance.

Asset and resource identification

We queried some key community opinion leaders and reviewed the websites of various government agencies, non-profit and faith-based organizations, educational institutions, health care institutions and ancillary health service providers to pinpoint Guam's health promoting assets and service resources. The information was consolidated into an asset and resource table for each of the four major districts in Guam.

Draft review and population input

Data partners and the community at large have had multiple opportunities to review and provide feedback to this current CHA report. The results of the CHA survey were disseminated by email and social media to the various stakeholder networks that assisted in the recruitment of survey participants with a month-long period for comments. The various DPHSS programs reviewed the completed report draft with their partner stakeholders and contributed numerous suggestions for revisions. In addition, we also

presented the final report to the diverse data gatekeepers at: (1) the SEOW's quarterly meeting on December 15, 2021 (See Annex C: SEOW Meeting Agenda), (2) the meeting of the Community Advisory Board of the American Cancer Society-Guam (February 8, 2022) and (3) the quarterly meeting of the Governor's PEACE Council (February 9, 2022) for a final review and feedback session.

Organization of this report

For consistency, this CHA update follows the format of the previous CHA and is divided into an introductory section with background information on the island's geography, political and socio-economic context, a section on data sources and methods, and separate sections on health data, community health priorities and community assets.

The health data section provides information about population demographics ("Who we are"), social determinants of health ("How we live"), risk factor prevalence and disease burden ("How's our health?"). 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, and with the data from 2014, when the first CHA was conducted. Where Guam is at a disadvantage compared to the U.S., or evincing worsening trend over time, the data are highlighted in red. Where Guam is better off than the U.S., or showing an improvement in trend over time, the data are highlighted in green. Whenever possible, data are 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.

The section on community health priorities details the findings from the community health survey that we conducted in place of in-person town hall meetings, given the COVID-19 pandemic restrictions on public gatherings over the past two years.

The section on community asset mapping summarizes the results of the desk review and information provided by key community opinion leaders on the resources available within the Guam community to support and promote health and wellness.

The report ends with a brief discussion of data limitations and gaps, and other health concerns expressed by community members. 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.

Background: Guam

Geographic, Political, and Economic Context

Guam, "where America's day begins," is the largest and southernmost island in the Mariana Islands archipelago. Located in the western North Pacific Ocean, it houses one of the most strategically important U.S. 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 1). This plays a significant part in the movement of food, medical and pharmacologic supplies, tobacco, electronic smoking devices, alcohol, and illicit drugs into the island. It also serves as a referral hub for medical care from the surrounding Pacific Islands, which may not have the specialty health care providers and health facilities that are available in Guam.

Guam's land area of 549 sq. km. is roughly three times the size of Washington, D.C. 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. The major typhoon, Pongsona, in December of 2002, had a major adverse impact on the island's economy and infrastructure.

Guam is an organized, unincorporated territory of the U.S. with policy relations under the jurisdiction of the Office of Insular Affairs, U.S. 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. Guam also elects one non-voting delegate to the U.S. House of Representatives to serve a two-year term. F.Q. The judicial branch was revamped to create the Unified Judiciary of Guam, consistent with the Organic Act, comprised of the District Court of Guam (federal) and the Supreme Court of Guam and the Superior Court of Guam (local).

Figure 1. Regional Map Showing Guam's Proximity to Key Countries

Source: CIA Factbook at http://www.cia.gov/cia/publications/factbook/geos/gq.html, last accessed 13 March 2021

Guam's economy relies heavily upon military spending, followed by tourism and other services. According to the CIA Factbook (available at https://www.cia.gov/the-world-

factbook/countries/guam last accessed 16 September 2021): "Total federal spending (defense and non-defense) amounted to $1.988 billion in 2016, or 34.2% of Guam's Gross Domestic Product (GDP). Of that total, federal grants and cover-over payments amounted to $3444.1 million in 2016, or 35.8% of Guam's total revenues for the fiscal year." Pre-pandemic, the economy was expanding in both its tourism and military sectors. The ongoing transfer of the military base on Okinawa to Guam continues to drive the expansion of the military sector, with continuous investments in military infrastructure helping to keep the local construction industry occupied. The COVID-19 pandemic devastated the tourism industry, and recovery is impeded by the multiple surges in cases. National defense spending and, at present, pandemic relief funds from the federal government, are cushioning the island's economy against fluctuations in tourism.

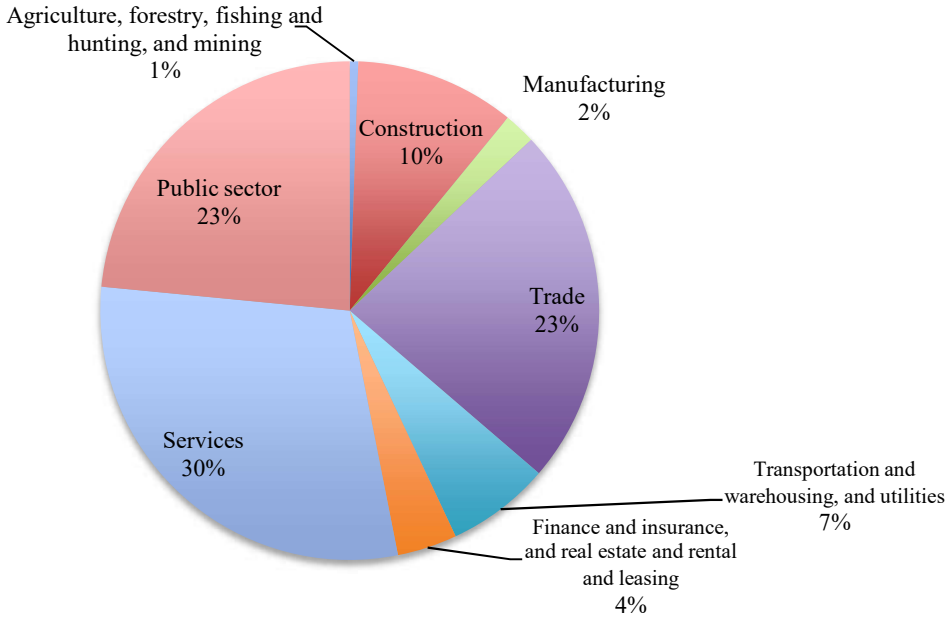
As of December 2019, there were 76,110 people in the civilian labor force; 71,440 were employed. About 6% were unemployed, as compared to 7.7% in 2014 (Table 2). As of December 2019, majority of the labor force were employed in services (30%), the public sector (23%), trade (23%), and construction (10%) (Figure 2).

Table 2. Employment status, population 16 years and older, Guam, 2019 and 2014

EMPLOYMENT STATUS	2019	2014
Total:	**123,380**	**121,850**
In labor force:	76,110	74,870
Employed:	71,440	69,110
Unemployed	4,670 (6.1%)	5,760 (7.7%)
Not in labor force:	47,270	46,710

Source: Bureau of Labor Statistics, Department of Labor as reported in the 2019 Guam Statistical Yearbook

Figure 2. Labor Force by Occupation, December 2019



Source: Bureau of Labor Statistics, Department of Labor as reported in the 2019 Guam Statistical Yearbook

Guam's GDP increased from $5,799 million in 2014 to $6,311 million in 2019, with a concomitant rise in per capita GDP from $33,981 (2014) to $34,393 (2019).

In 2010, which is the latest year data is available[9], there were 44,664 households in 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 impoverished comprised 7% of all households on Guam and lived on less than $3,000 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 2019

Population Demographics

The latest data from the 2010 Guam census[1] 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

[9] We are still awaiting the official release of Guam's 2020 Census data with information on household income.

earlier 2000 census likely resulted in underestimates (Tables 4-5). (Note: Data from the 2020 census are expected to be released at the end of 2021.)

Table 4. Population estimate: 2000 to 2010

Year	Population	Year	Population
2000	154,805		
2001	155,254	2006	157,521
2002	155,705	2007	157,978
2003	156,157	2008	158,437
2004	156,610	2009	158,897
2005	157,065	2010	159,358

Sources: 2000 and 2010 Censuses of Guam

Table 5. Population projection: 2011 to 2020

Year	Population	Year	Population
2011	159,600	2016	162,742
2012	159,194	2017	163,875
2013	160,378	2018	165,177
2014	161,001	2019	166,658
2015	161,785	2020	168,489

Source: 2010 Census of Guam; International Programs Center, US Census Bureau, as reported in the 2019 Guam Statistical Yearbook

Males slightly outnumbered females, comprising 51% of the total population. Nearly 40% of the population is under the age of 21 years (Table 6). Guam's population is multi-ethnic/multi-racial. CHamorus remain the largest ethnic group, making up 37.3% of the island's population, and representing a 3.6% increase since 2000. Filipinos are the second largest group, comprising 26.3% 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, 144,429, identify themselves as being of one ethnic origin or race, representing an increase of 8.4% since 2000. Just 14,929 acknowledge two 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, 2019

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

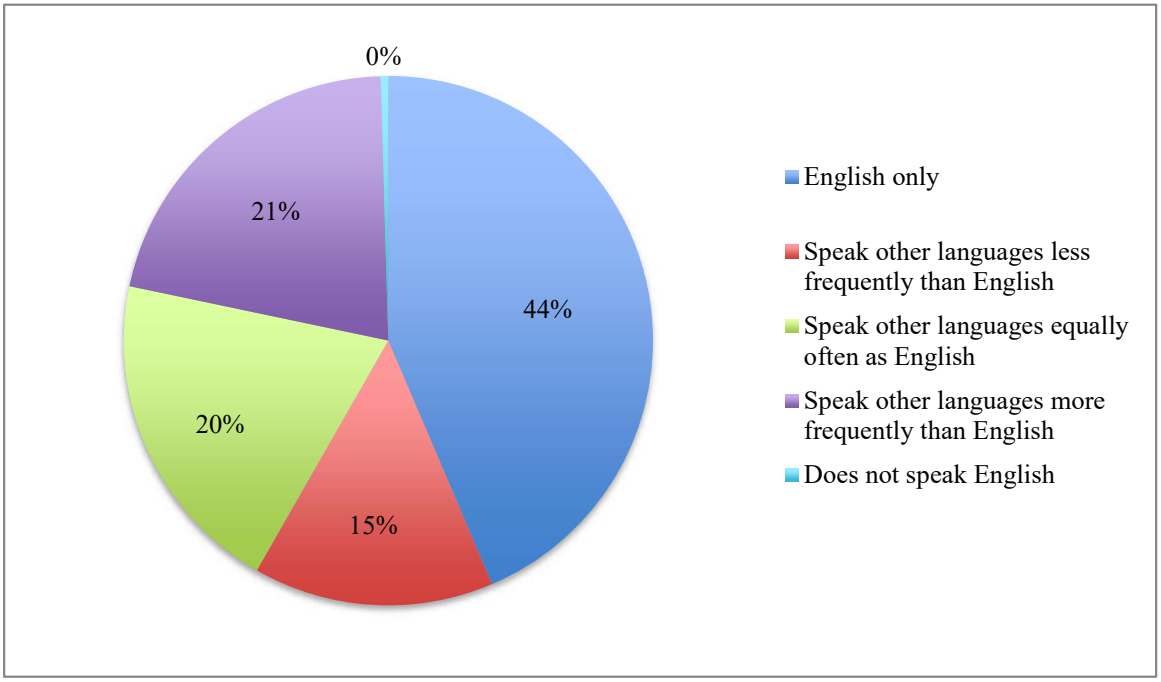
ETHNICITY	2010	2000*
One Ethnic Origin or Race:	144,429	133,252
Native Hawaiian and Other Pacific Islander:	78,582	69,039
Carolinian	242	123
Chamorro	59,381	57,297
Chuukese	11,230	6,229
Kosraean	425	292
Marshallese	315	257
Palauan	2,563	2,141
Pohnpeian	2,248	1,366
Yapese	1,263	686
Other Native Hawaiian 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	
Chamorro 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 as reported by the Bureau of Statistics and Plans, 2012
*Source: US Census Bureau, 2000 Census for Guam as reported by the Bureau of Statistics and Plans, 2005

The ethnic diversity is reflected in the languages spoken at home. Twenty percent of the population over 5 years of age speak a language as frequently as English at home, another

21% speak a language more frequently than English, and 0.5% speak 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 3).

Figure 3. Population by language spoken at home, Guam, 2010



Source: 2010 Census for Guam as reported by the Bureau of Statistics and Plans, 2019

Health Data

Who we are: The social determinants of health

Population demographics

Population demographics are a significant determinant of a community's health. This section provides an overview of the demographics of the Guam population as compared to the U.S.A. All data, unless specifically noted, are taken from the 2010 U.S. Census. (Note: Data from the 2020 census are expected to be released at the end of 2021 and were not available at the time this report was prepared.)

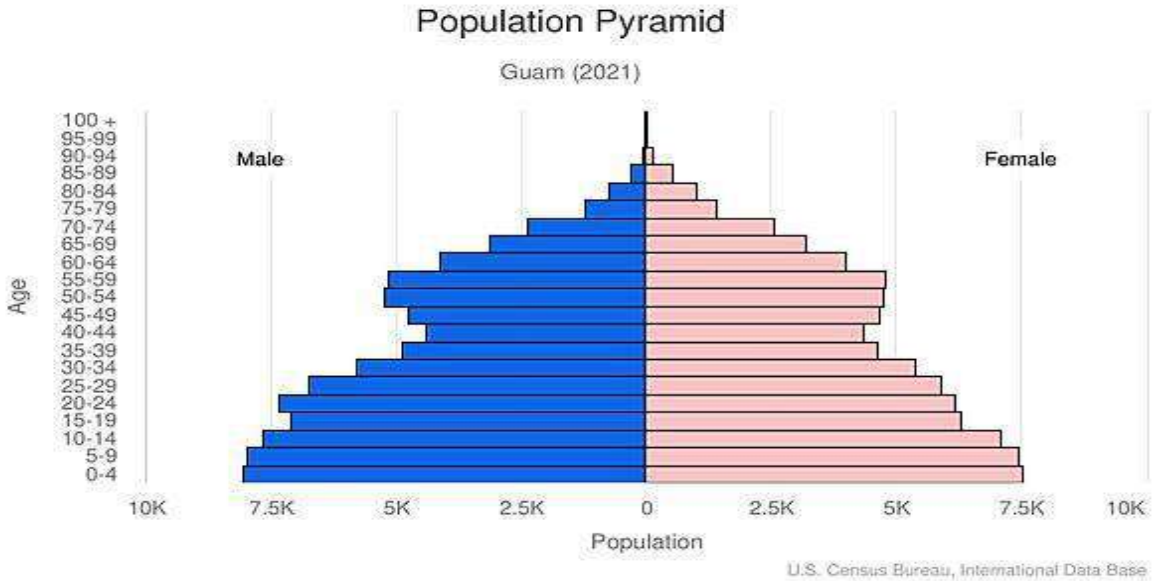
Guam's people are relatively younger and have a larger proportion under the age of 25 years, accounting for the pyramidal shape, while the U.S. population has a larger proportion of older people, accounting for its barrel shape. The sex ratio in Guam favors men (Table 8, Figures 4-5).

Table 8. Population characteristics, Guam vs. USA, 2020 estimates

Demographic characteristic	Indicator	Guam	USA
Age composition	% Population under 25 years	43.3%	31.4%
	% Population 65 years and over	9.54%	16.8%
	Median age	29.4 yrs	38.5 yrs
	Dependency ratio (young & old)	52.4 per 100 persons	53.9 per 100 persons
Sex distribution	Male: female ratio	1.06:1	.97:1
Ethnic composition	% Pacific Islander	49.3%	0.2%

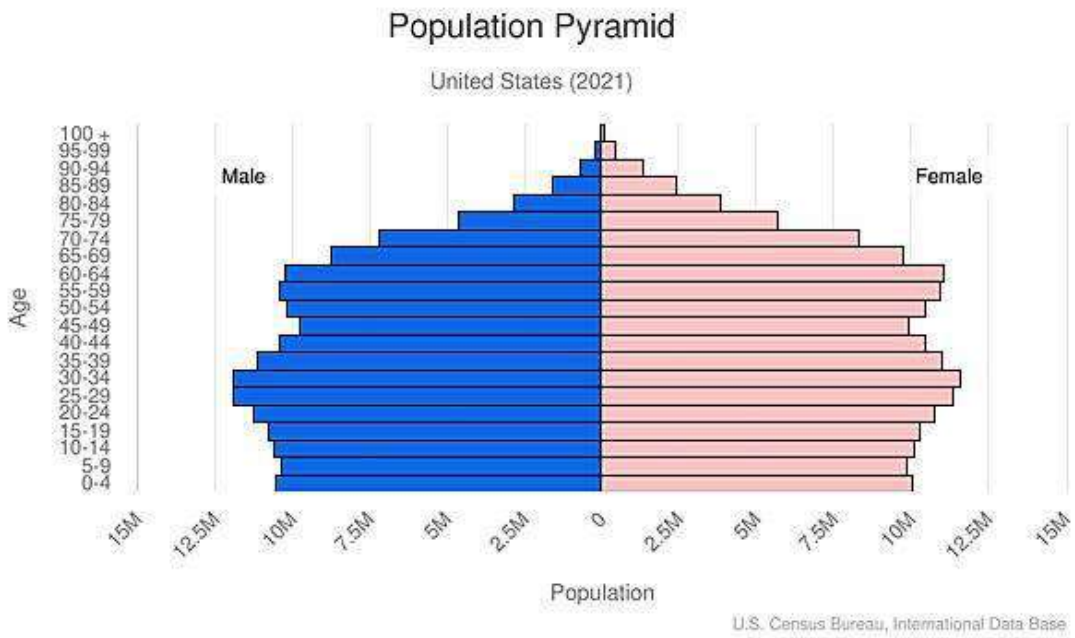
Source: Estimates based on US Population Census, 2010, as reported in https://www.cia.gov/the-world-factbook/countries/ last accessed September 2021

Figure 4. Guam Population Pyramid, 2021



Source: US Population Census, 2020 as reported in https://www.cia.gov/the-world-factbook/countries/guam, last accessed September 2021

Figure 5. USA Population Pyramid, 2010



Source: US Population Census, 2020 as reported in https://www.cia.gov/the-world-factbook/countries/united-states/ last accessed September 2021

The median age of Guam's population is about 9 years lower than the U.S. median age. Guam's dependency ratio is similar to the U.S. ratio; however, Guam's dependents are predominantly the young, while in the U.S., the elderly comprise a larger proportion of the dependent population. This has significant implications for health care needs and health financing. Finally, nearly half of Guam's population is of Pacific Islander ethnicity, compared to less than 1% of the U.S. mainland population.

Social Determinants

Nearly 1 in 3 persons in Guam is foreign-born, compared to 1 in 8 for the U.S. mainland, and over half of people in Guam speak a language other than English at home, compared to only 1 in 5 in the U.S. Guam residents are less likely to have a high school diploma or a college degree than U.S. residents. Household size is larger in Guam, but the percentage of households headed by a single female is significantly less than the U.S. The unemployment rate is higher in Guam, the median household income is about $14,000 less than the U.S. median household income, and per capita income is half that of the U.S. Nearly 20% of Guam's residents live below the poverty level, compared to only 15% of U.S. mainland residents. Taken altogether, the socio-economic status of Guam residents is considerably worse than people living in the U.S.; this has significant adverse implications for health status (Table 9).

The COVID-19 pandemic has highlighted media access, and in particular, digital access, as a new social determinant. With much of civic engagement, health care provision, work from home and social interaction shifting to online media, digital participation has emerged as a vital factor for wellness and health care access. Guam has a greater proportion of the population with fixed telephone line access than the U.S.; however, for both countries, mobile telephone access has eclipsed traditional land line subscriptions. A lower percentage of Guam's population with access to mobile and internet platforms compared to the U.S.

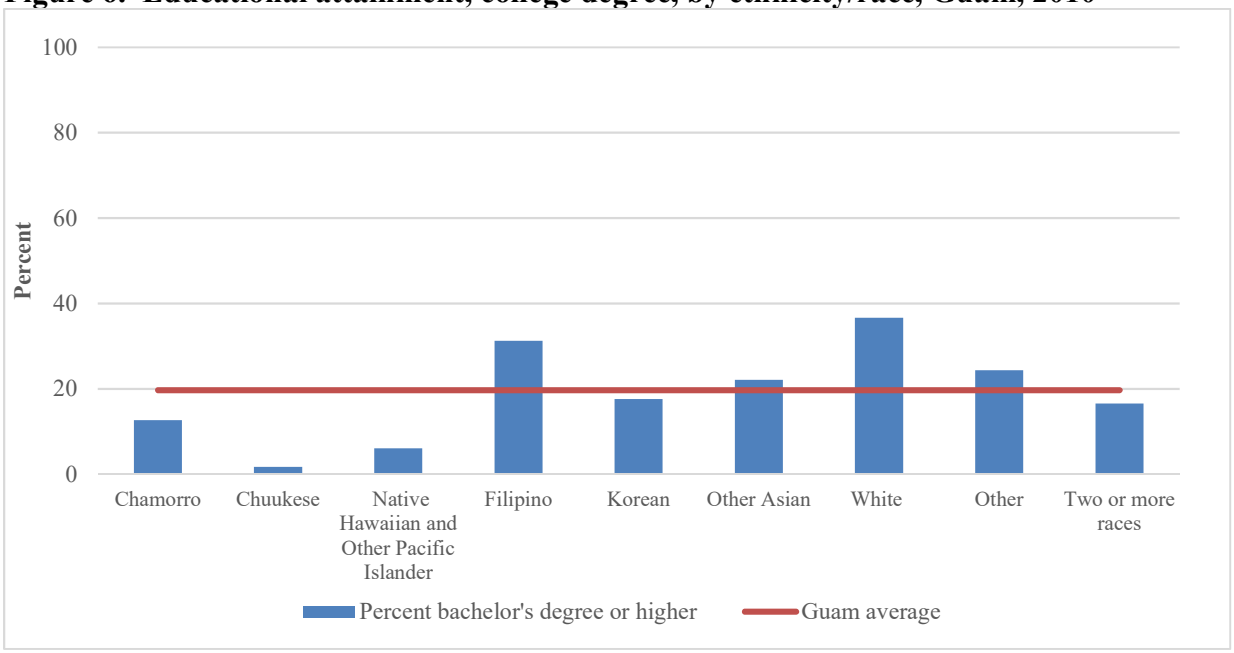
Table 9. Key socio-economic indicators, Guam vs. USA, by latest year data available

Social determinant	Indicator	Guam	USA
Migration	% Foreign-born	31.4% (2010)	12.8% (2010)
Language	% Speak a language other than English at home	56.4% (2010)	20.6% (2010)
Employment	% Civilian workforce employed	93.9% (Dec 2019)	96.4% (Dec 2019)
	Unemployment rate	6.1% (Dec 2019)	3.5% (Dec 2019)
Education	% Population with a high school degree	79.4% (2010)	85.4% (2010)
	% Population with a college degree	20.4% (2010)	28.2% (2010)
	Public school dropout rate	6.8% (2010)	7.40% (2010)
Households	Average household size	3.67 (2010)	2.63 (2010)
	% Households with female householder, no husband	1.8% (2010)	12.7% (2010)
	Grandparents as caregivers	39.5% of all grandparents (2010)	39.1% (2010)
Income	Median household income	$39,052 (2010)	$52,762 (2010)
	Mean per capita income	$12,864 (2010)	$27,915 (2010)
	% Population below poverty level	19.9% (2010)	15.3% (2010)
Media access	Fixed line telephone subscriptions per 100 inhabitants	42 (2019 estimate)	32.8 (2019 estimate)
	Mobile telephone subscriptions per 100 inhabitants	113 (2016 estimate)	135 (2019 estimate)
	Percent of population with internet access	80.5% (2018 estimate)	87.3% (2018 estimate)

Sources: US Population Census, 2010; US and Guam Department of Labor 2019 data; https://www.cia.gov/the-world-factbook/countries/ last accessed September 2021

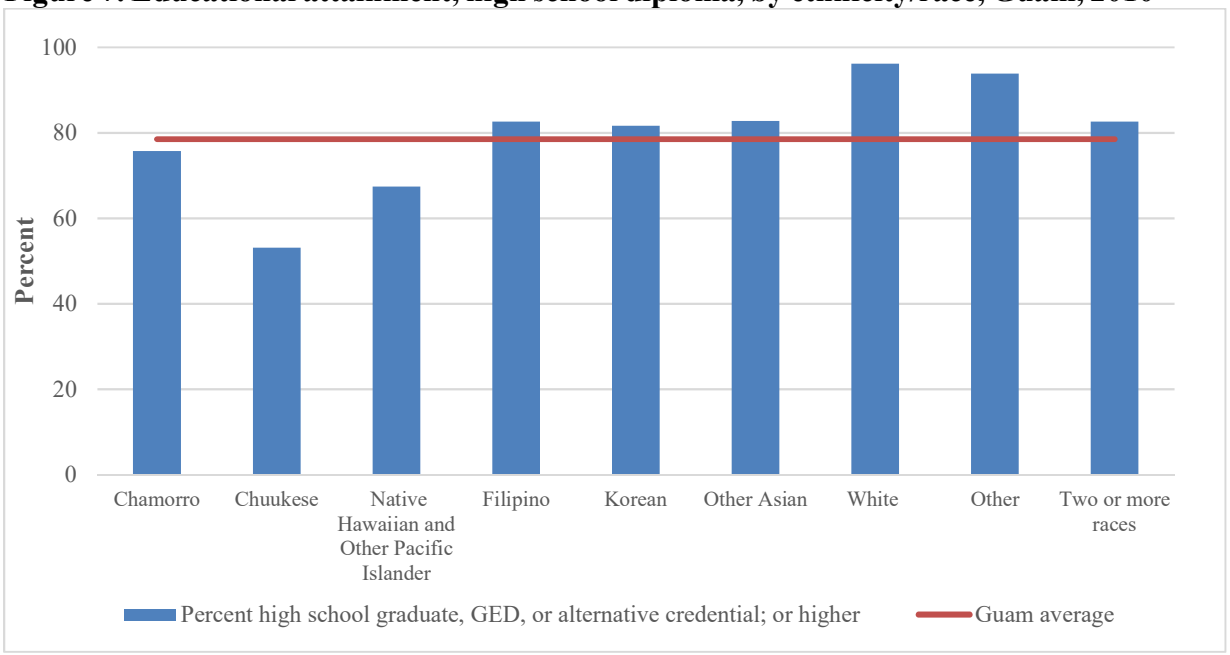
Within the Guam population, significant disparities exist in relation to socio-economic status and race/ethnicity. Pacific Islanders are less likely than other races/ethnic groups to hold a college degree (Figure 6). Pacific Islanders other than the indigenous CHamorus are less likely to have a high school diploma (Figure 7) and more likely to live under the poverty level as compared to Asians, Whites and other ethnic groups (Figure 8). These data indicate that race/ethnicity is a critical social determinant for health in Guam.

Figure 6. Educational attainment, college degree, by ethnicity/race, Guam, 2010



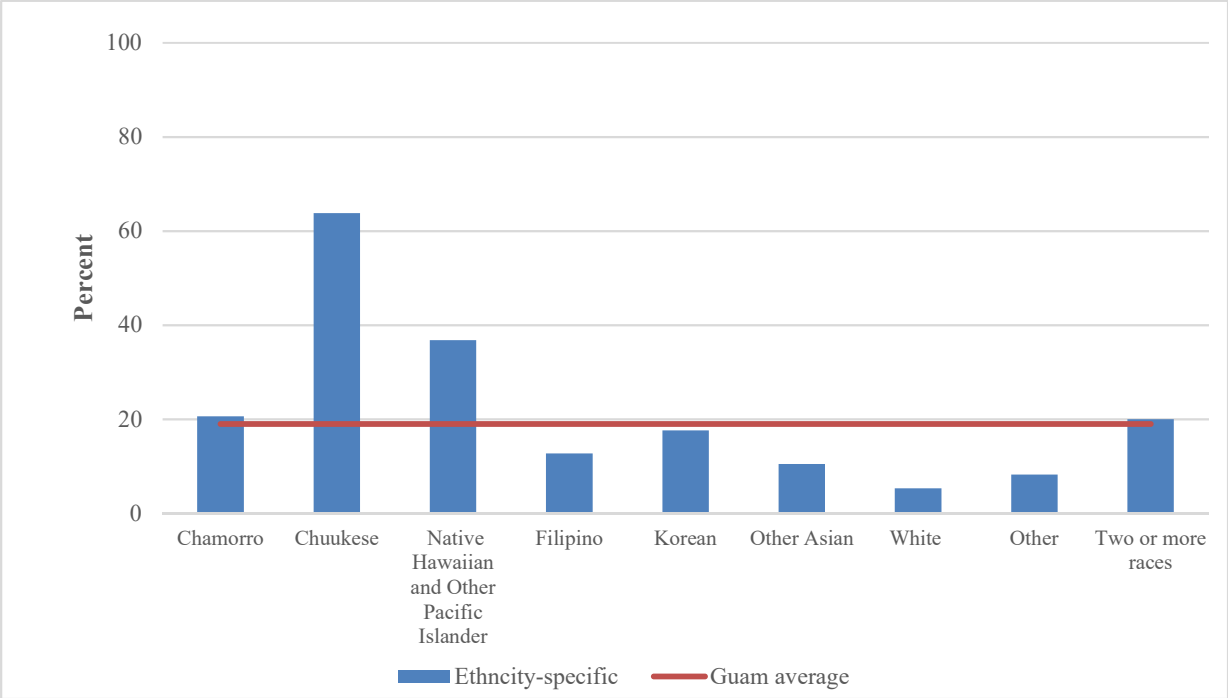
Source: US Population Census, 2010

Figure 7. Educational attainment, high school diploma, by ethnicity/race, Guam, 2010



Source: US Population Census, 2010

Figure 8. Percent living below the poverty level by ethnicity/race, Guam 2010



Source: US Population Census, 2010

How we live

This section provides data on environmental indicators, behaviors and risk, and protective factors related to health.

Environment

Access to running water and a public sewer is similar across the two locations. A larger percentage of the population in Guam live in houses without an indoor kitchen (9.7% vs. 1.0%) and without telephone service (3.9% vs. 2.1%). In contrast, a smaller percentage of the population in Guam is without Internet service (6.7% vs. 25.8%). Discussions with the Guam's telecommunications provider indicate that an increasing percentage of the population are switching from land lines to cellular telephones. Outdoor kitchens are popular in Guam; this may contribute to the smaller percentage reporting a lack of indoor kitchen facilities. A smaller proportion of housing units in Guam report the lack of a vehicle, and the mean vehicles per household in Guam is comparable to the U.S. average. The 2019 violent crime rate is lower in Guam; however, property crime rate is higher than the U.S. The population density is markedly higher in Guam. (Table 10).

Table 10. Comparison of environmental indicators, Guam vs. US, by latest year data available

Domain	Indicator	Source	Guam	USA
Housing quality	% Housing units with running water	2010 Census	99.4%	97.7%
	% Housing units with public sewer access	2010 Census	72.4%	74.7%
	% Population without a kitchen	2010 Census	9.7%	1.02%
Communication access	% Population without telephone service	2010 Census	3.9%	2.10%
	% Population without internet service	2010 Census	6.7%	25.8%
Transport	% Housing units without vehicles	2010 Census	6.7%	9.1%
	Vehicles per household	2010 Census	1.9	1.92
Crime	Violent crime rate	Guam: 2019 BSP data US: 2019 FBI UCR data	337.8/100,000	379.4/100,000
	Property crime rate		2427.7/100,000	2109.9/100,000
Population density	Persons per square mile	2010 Census	751.7	87.4

Note: BSP = Guam Bureau of Statistics and Plans; FBI = Federal Bureau of Investigation; UCR = Uniform Crime Report at https://ucr.fbi.gov/crime-in-the-u.s/2019/crime-in-the-u.s.-2019/topic-pages/property-crime last accessed September 2021

Behaviors affecting health

Injury prevention

The use of seatbelts is similar in Guam and the U.S. mainland. The Healthy People (HP) 2020 target for this indicator was reached. Youth in Guam are more likely to ride in a vehicle driven by someone who had consumed alcohol, and more likely to drink and drive (Table 11).

Table 11. Injury prevention indicators, Guam vs. US, 2019-2020

Domain	Indicator	Source	Guam	USA	HP 2020 target
Injury prevention	% Always wearing seatbelt, adults	2020 BRFSS	91.3%	94.2%	92.0%
	% Never/rarely wearing seatbelt, youth	2019 YRBS	7.5%	6.5%	-
	% Riding in a vehicle driven by someone who had consumed alcohol, youth	2019 YRBS	25.9%	16.7%	-
	% Drinking and driving, adults	2020 BRFSS	3.8%	2.3%	-
	% Drinking and driving, youth	2019 YRBS	8.2%	5.4%	-

Note: HP 2020 = Healthy People 2020; "- "– no HP 2020 target established

Drinking and driving has gone down over time for adults but has increased for youth. However, youth are less likely to ride in a vehicle driven by someone who had consumed alcohol at present, compared to 2011 (Table 12).

Table 12. Injury prevention indicators, Guam, current vs. baseline

Domain	Indicator	Source pf Baseline	Baseline	Current	Source of current
Injury prevention	% Always wearing seatbelt, adults	2011 BRFSS	91.5%	91.3%	2020 BRFSS
	% Never/rarely wearing seatbelt, youth	2011 YRBS	8.7%	7.5%	2019 YRBS
	% Riding in a vehicle driven by someone who had consumed alcohol, youth	2011 YRBS	34.9%	25.9%	2019 YRBS
	% Drinking and driving, adults	2012 BRFSS	7.4%	3.8%	2020 BRFSS
	% Drinking and driving, youth	2011 YRBS	5.8%	8.2%	2019 YRBS

Immunization uptake

Immunization uptake for adults, infants and children is significantly lower in Guam than in the U.S. (Table 13); all immunization rates for children and adults in Guam fall short of the HP 2020 targets. Uptake of the flu and shingles vaccination increased between 2011 and 2019. Pneumonia and tetanus immunization uptake remained unchanged over time (Table 14).

Table 13. Immunization indicators, Guam vs. US, by year latest data available

Domain	Indicator	Source	Guam	USA	HP2020 target
Immunization, adults	% Flu shot in past year	2020 BRFSS	52.6%	67.8%	70% adults 18+ yrs.
	% Ever had pneumonia vaccine	2020 BRFSS	33.4%	71.8%	90% adults >65 years
	% Ever had a tetanus shot	2019 BRFSS	57.5%	72.1%	-
	% Ever had shingles vaccination	2017 BRFSS	18.1%	28.6%	30% adults 60+ years
Immunization, infants and children	% Children 19-35 mos. immunized against MMR	2017 DPHSS data	82.5%	91.5%	90%
	% Children 19-35 mos. immunized against DTaP	2017 DPHSS data	67.1%	83.2%	90%

Note: HP 2020 = Healthy People 2020; "-" – no HP 2020 target established
2017 DPHSS vaccination data as published in the Guam Daily Post
https://www.postguam.com/news/local/guam-vaccination-rates-lower-than-national-average/article_c92587bc-ce09-11e9-8b69-73ad39bade82.html last accessed September 2021

Table 14. Immunization indicators, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Immunization, adults	% Flu shot in past year	2011 BRFSS	39.2%	52.6%	2020 BRFSS
	% Ever had pneumonia vaccine	2011 BRFSS	39.4%	33.4%	2020 BRFSS
	% Ever had a tetanus shot	2013 BRFSS	55.3%	57.5%	2019 BRFSS
	% Ever had shingles vaccination	2014 BRFSS	12.1%	18.1%	2017 BRFSS
Immunization, infants and children	% Children 19-35 mos. immunized against MMR			82.5%	2017 DPHSS data
	% Children 19-35 mos. immunized against DTaP			67.1%	2017 DPHSS data

Note: 2017 DPHSS vaccination data as published in the Guam Daily Post https://www.postguam.com/news/local/guam-vaccination-rates-lower-than-national-average/article_c92587bc-ce09-11e9-8b69-73ad39bade82.html last accessed September 2021

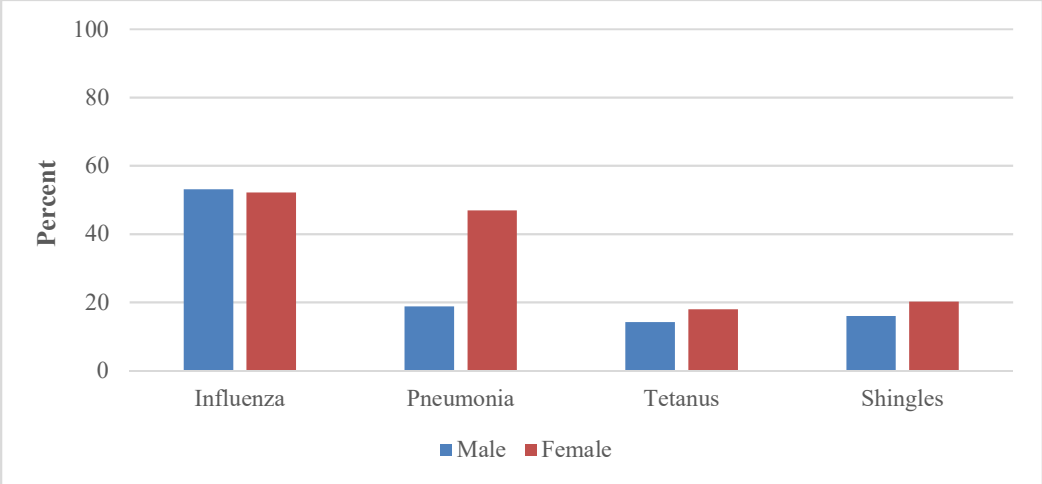
Among adults, women are more likely than men to have pneumonia, tetanus, or shingles vaccination (Figure 9.) Educational level does not appear to influence immunization uptake in adults (Table 15.)

Table 15. Adults reporting immunization, by educational attainment, 2017-2019

Educational level	% Vaccinated for influenza	% Vaccinated for pneumonia	% Vaccinated for tetanus (Tdap)	% Vaccinated for shingles
< High School	NA	NA	NA	NA
H.S. or G.E.D.	46.5%	46.5%	15.2%	18.7%
Some post H.S.	NA	NA	22.5%	17.7%
College grad	49.4%	49.4%	18.2%	22.6%

Source: 2020 BRFSS for influenza, pneumonia; 2019 BRFSS for tetanus; 2017 BRFSS for shingles
Note: NA = not available

Figure 9. Adults reporting immunization, by sex, 2017-2020



Source: 2017 BRFSS for shingles, 2019 BRFSS for influenza, pneumonia, and tetanus data

Sexual health

Human Immunodeficiency Virus (HIV) testing is reported by a lower percentage of adults in Guam compared to the U.S. the Guam rate falls way below the HP 2020 target (Table 16.)

Table 16. Sexual health indicators, Guam vs. USA, 2019-2020

Domain	Indicator	Source	Guam	USA	HP 2020 target
Sexual health	% Tested for HIV, adults	2020 BRFSS	31.4%	37.1%	90.0%
	% Youth taught about HIV/AIDS	2019 YRBS	76.1%	84.0%	-
	% Youth sexually active	2019YRBS	23.9%	27.4%	-
	% Youth with 4 or more sexual partners	2019 YRBS	6.0%	8.6%	-
	% Youth used a condom during sex	2019 YRBS	41.6%	54.3%	55.6% females; 81.5% males
	% Female youth using oral contraceptives	2019 YRBS	10.3%	23.0%	-

Note: HP 2020 = Healthy People 2020; "- "– no HP 2020 target established

Table 17. Sexual health indicators, Guam, current vs. baseline

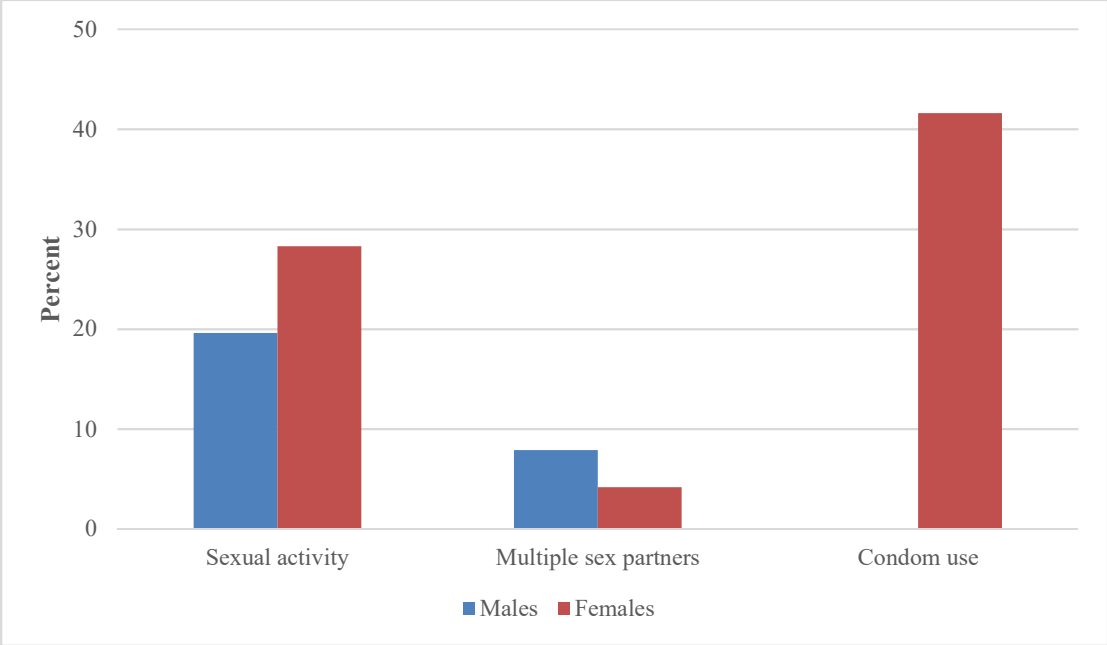
Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Sexual health	% Tested for HIV, adults	2011 BRFSS	36.6%	31.4%	2020 BRFSS
	% Youth taught about HIV/AIDS	2011 YRBS	86.0%	76.1%	2019 YRBS
	% Youth sexually active	2011 YRBS	49.0%	23.9%	2019 YRBS
	% Youth with 4 or more sexual partners	2011 YRBS	12.0%	6.0%	2019 YRBS
	% Youth used condom during sex	2011 YRBS	32.5%	41.6%	2019 YRBS
	% Female youth using oral contraceptives	2011 YRBS	7.5%	10.3%	2019 YRBS

Guam youth are less likely than youth in the U.S. mainland to have been taught about Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDs) despite similar rates of sexual activity. Guam youth are also less likely to report having multiple sex partners. The use of condoms during sex is less frequently reported by Guam youth; this falls below HP 2020 targets. Female youth in Guam are less likely to use contraceptives than their mainland counterparts (Table 16).

Between 2011 and 2019, the percentage of youth reporting sexual activity and multiple sex partners decreased, while the use of condoms and oral contraceptives increased (Table 17). HIV testing among adults and education about HIV/AIDS among youth decreased over time.

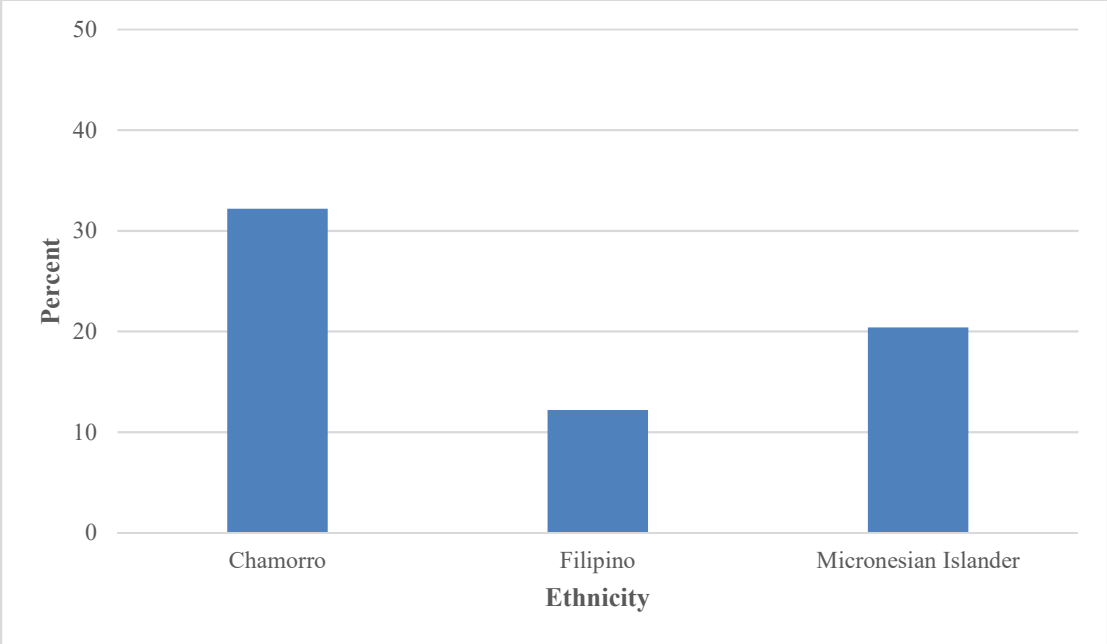
In Guam, girls are more likely than boys to be sexually active, but less likely to report multiple partners (Figure 10.) Filipino and other Micronesian Islanders are less likely to be sexually active compared to CHamoru youth (Figure 11).

Figure 10. Sexual activity status and condom use, by sex, Guam, 2019



Source: Guam YRBS, 2019; for condom use, male respondents < 100; hence results were not reported

Figure 11. Sexual activity status by race/ethnicity, Guam youth, 2019



Source: Guam YRBS, 2019

Risk and protective factors

Tobacco use

Smoking prevalence and smokeless tobacco use remain higher in Guam than in the U.S., for both adults and youth. Youth smoking has surpassed the HP 2020 target; however, adult smoking, youth and adult smokeless tobacco use and quit attempts have not met the HP 2020 targets (Table 18). Over time, adult and youth smoking and youth smokeless tobacco use have declined in Guam (Table 19).

Table 18. Tobacco use indicators, Guam vs. USA, 2017-2020

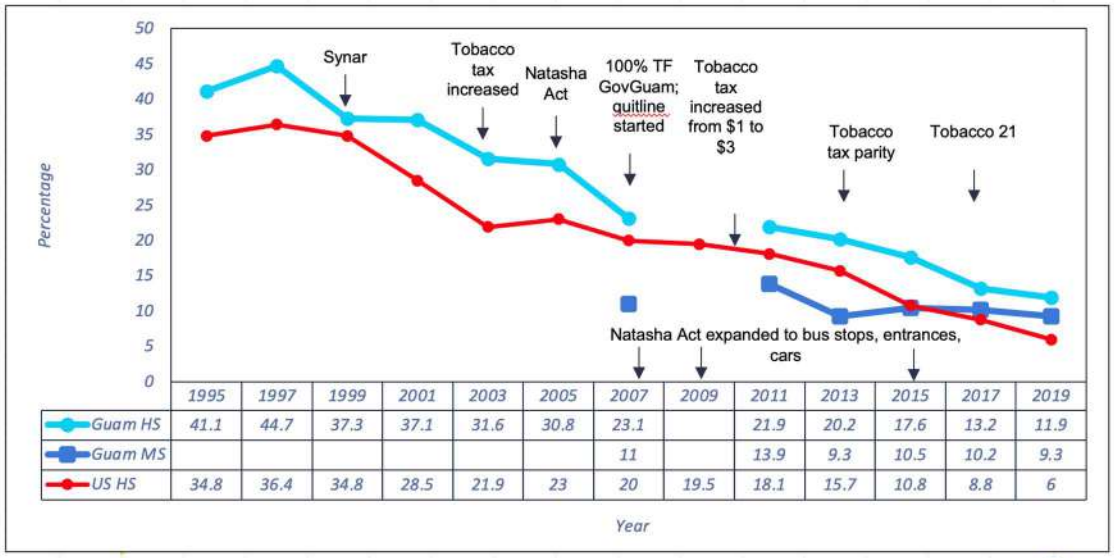
Domain	Indicator	Source	Guam	USA	HP 2020 target
Tobacco use	Smoking prevalence, adults	2020 BRFSS	20.0%	15.5%	12.0%
	Smoking prevalence, youth	2019 YRBS	11.9%	6.0%	16.0%
	Smokeless tobacco use, adults	2020 BRFSS	6.4%	3.7%	0.3%
	Smokeless tobacco use, youth	2019 YRBS	11.4%	3.8%	6.9%
	% Quit attempt in past year, adults	2017 BRFSS	72.3%	65.4%	80.0%
	% Quit attempt in past year, youth	2019 YRBS	67.0%	47.6%	64.0%

Table 19. Tobacco use indicators, Guam, current vs. baseline

Domain	Indicator	Source	Baseline	Current	HP 2020 target
Tobacco use	Smoking prevalence, adults	2011 BRFSS	30.5%	20.0%	2020 BRFSS
	Smoking prevalence, youth	2011 YRBS	21.9%	11.9%	2019 YRBS
	Smokeless tobacco use, adults	2005 NHIS	6.9%	6.4%	2020 BRFSS
	Smokeless tobacco use, youth	2011 YRBS	14.0%	11.4%	2019 YRBS
	% Quit attempt in past year, adults	2011 BRFSS	70.0%	72.3%	2017 BRFSS
	% Quit attempt in past year, youth	2011 YRBS	68.7%	67.0%	2019 YRBS

Guam started seeing a decline in smoking prevalence in 2007, one year after implementation of the Natasha Act (Public Law 28-80: Guam's smoke-free public places law). In 2007, the Government of Guam issued a GovGuam tobacco-free policy and launched the Guam Tobacco Cessation Quitline. These were followed by other policies that increased tobacco taxes in 2010, established tax parity across various classes of tobacco products in 2013, expanded the scope of the Natasha Act (2007, 2009, 2015) and raised the age for tobacco use, sales, and possession to 21 in 2017. Progressive decreases in smoking prevalence followed these policies. However, the rate of decline has not been sufficient to close the gap between Guam and the U.S. (Figure 12).

Figure 12. Smoking prevalence, youth, Guam vs. USA, 1995-2019



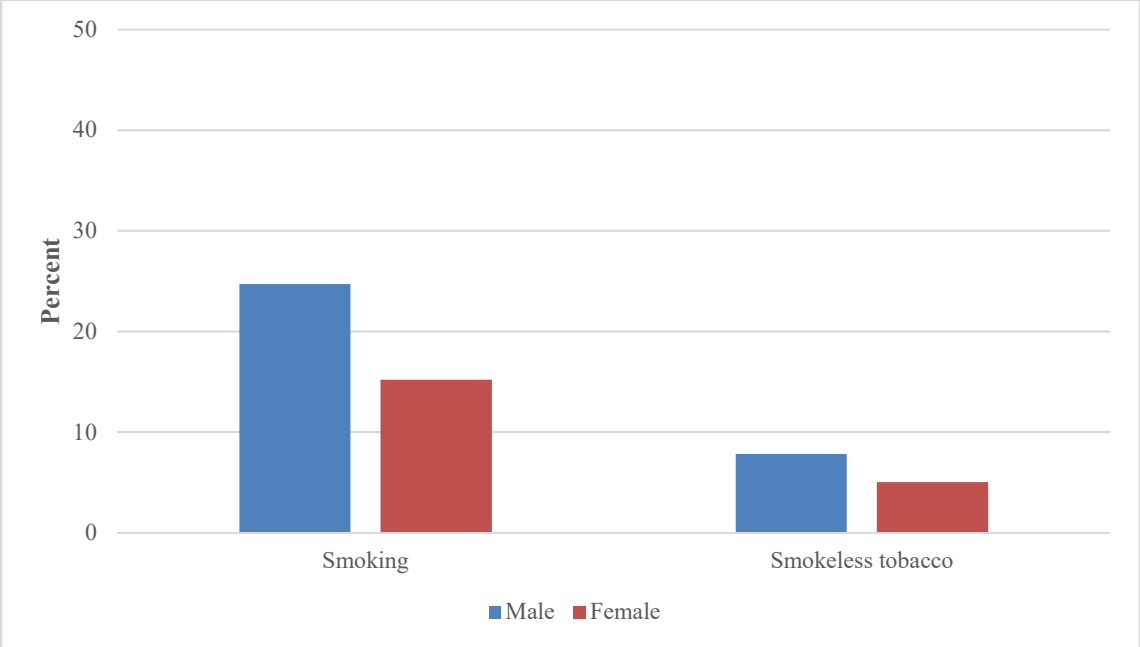
	1995	1997	1999	2001	2003	2005	2007	2009	2011	2013	2015	2017	2019
Guam HS	41.1	44.7	37.3	37.1	31.6	30.8	23.1		21.9	20.2	17.6	13.2	11.9
Guam MS							11		13.9	9.3	10.5	10.2	9.3
US HS	34.8	36.4	34.8	28.5	21.9	23	20	19.5	18.1	15.7	10.8	8.8	6

Source: YRBS, 1995-2019

Adult tobacco use

Women are less likely to smoke or use smokeless tobacco in Guam (Figure 13).

Figure 13. Current tobacco use, adults, by sex, Guam, 2020

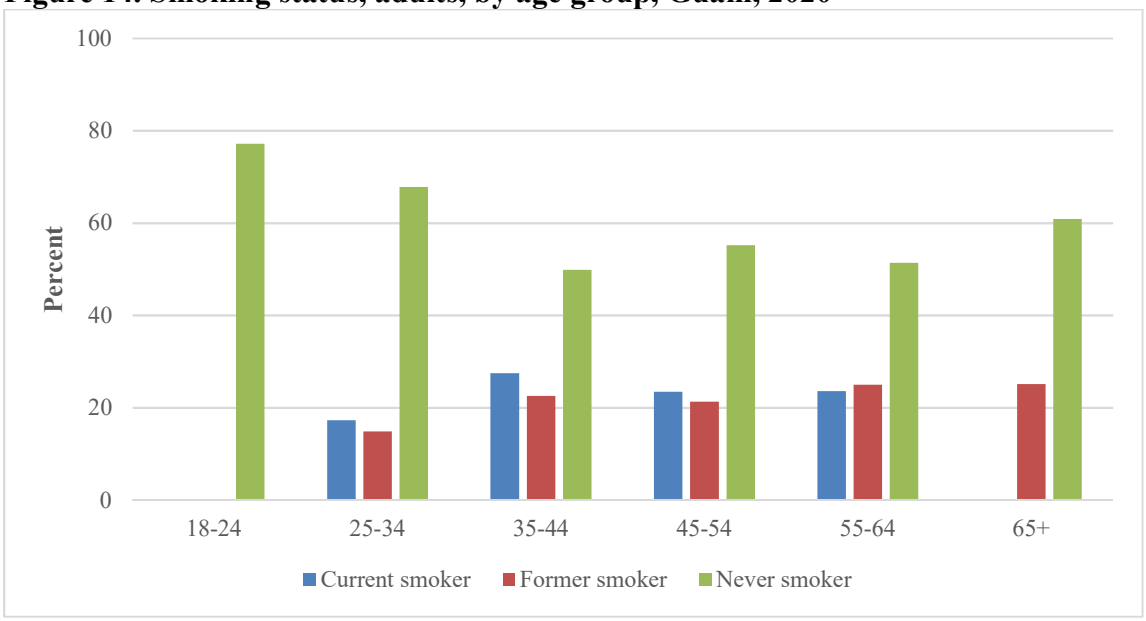


Source: BRFSS, 2020

Smoking is highest among adults aged 35+ years and is reported less frequently by those under 35 years (Figure 14). Smoking is inversely related to income (Figure 15) and educational attainment (Figure 16), with current smoking reported more frequently by those with lower incomes and less years of education. In contrast, those who have the most education and the highest income are more likely to have quit successfully (former smokers) or to have never smoked at all. This is consistent with global findings that link

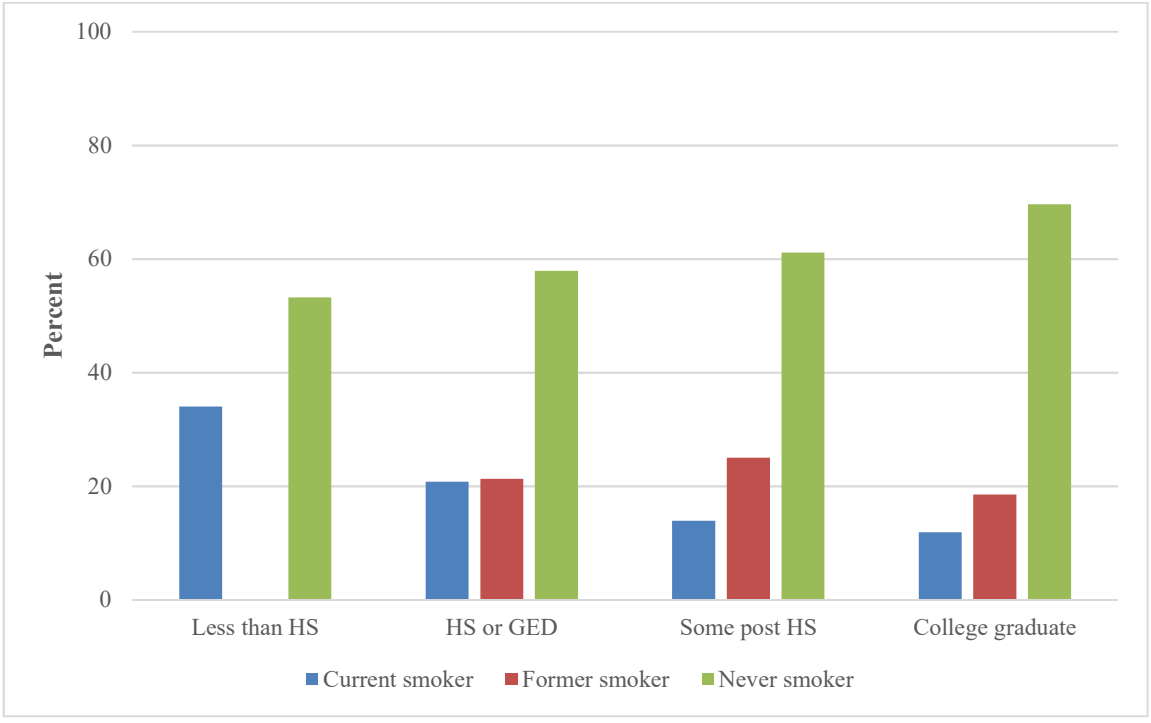
smoking with socio-economic status and educational attainment as social determinants of health. A similar pattern is noted for smokeless tobacco use.

Figure 14. Smoking status, adults, by age group, Guam, 2020



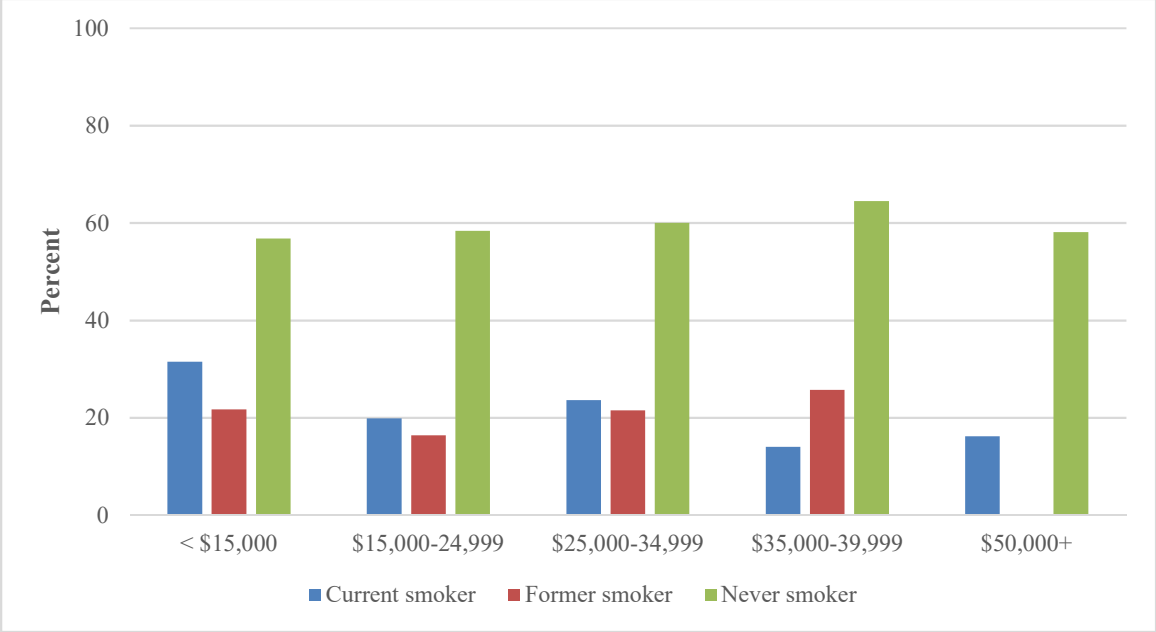
Source: Guam BRFSS, 2020

Figure 15. Current smoking, adults, by education, Guam, 2020



Source: Guam BRFSS, 2020

Figure 16. Smoking status, adults, by income, Guam, 2020

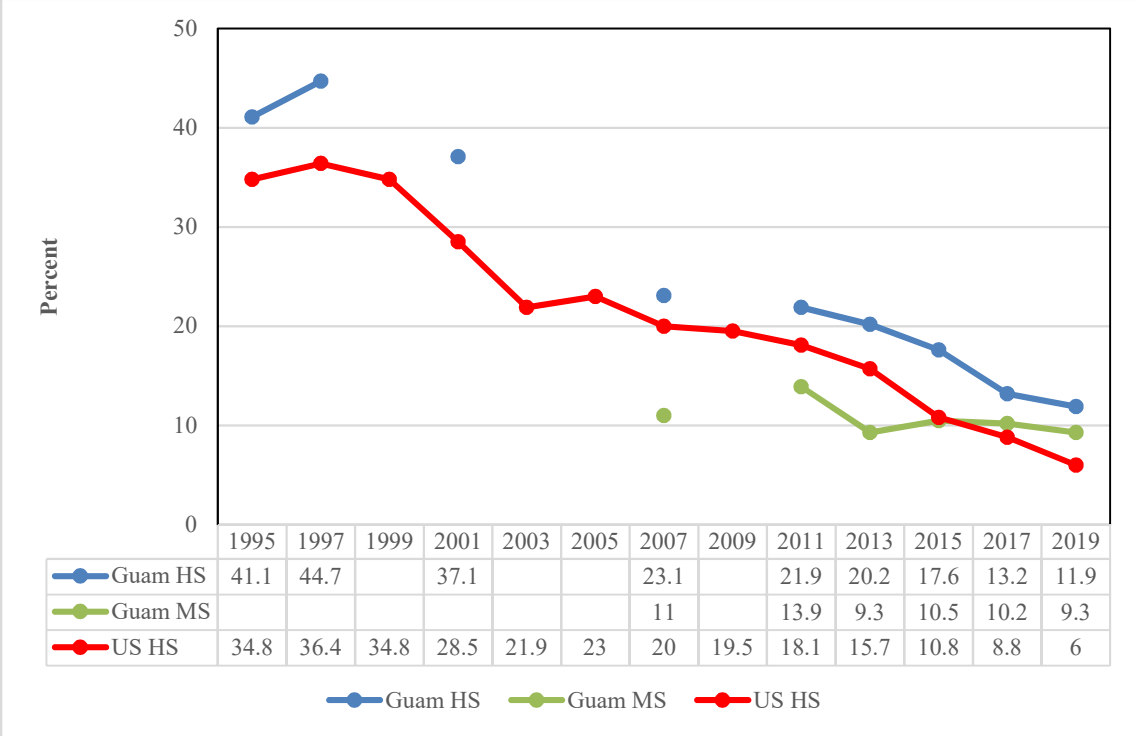


Source: Guam BRFSS, 2020

Youth tobacco use

Tobacco use prevalence among youth has been declining in the U.S. mainland and in Guam (Figure 17). In Guam, the decline in current smoking started in 1999, spurred by tobacco control policy and legislation.

Figure 17. Current smoking, high school & middle school, Guam vs. US, 1995-2019



	1995	1997	1999	2001	2003	2005	2007	2009	2011	2013	2015	2017	2019
Guam HS	41.1	44.7		37.1			23.1		21.9	20.2	17.6	13.2	11.9
Guam MS							11		13.9	9.3	10.5	10.2	9.3
US HS	34.8	36.4	34.8	28.5	21.9	23	20	19.5	18.1	15.7	10.8	8.8	6

Source: YRBS 1995-2019

The current smoking and smokeless tobacco use rates for young males are higher than that of young females (Figure 18). Micronesian islander youth have the highest rates for current

smoking and smokeless tobacco use, followed by CHamoru youth. Filipinos have the lowest rates (Figure 19).

Figure 18. Current tobacco use, high school, by sex, Guam, 2019

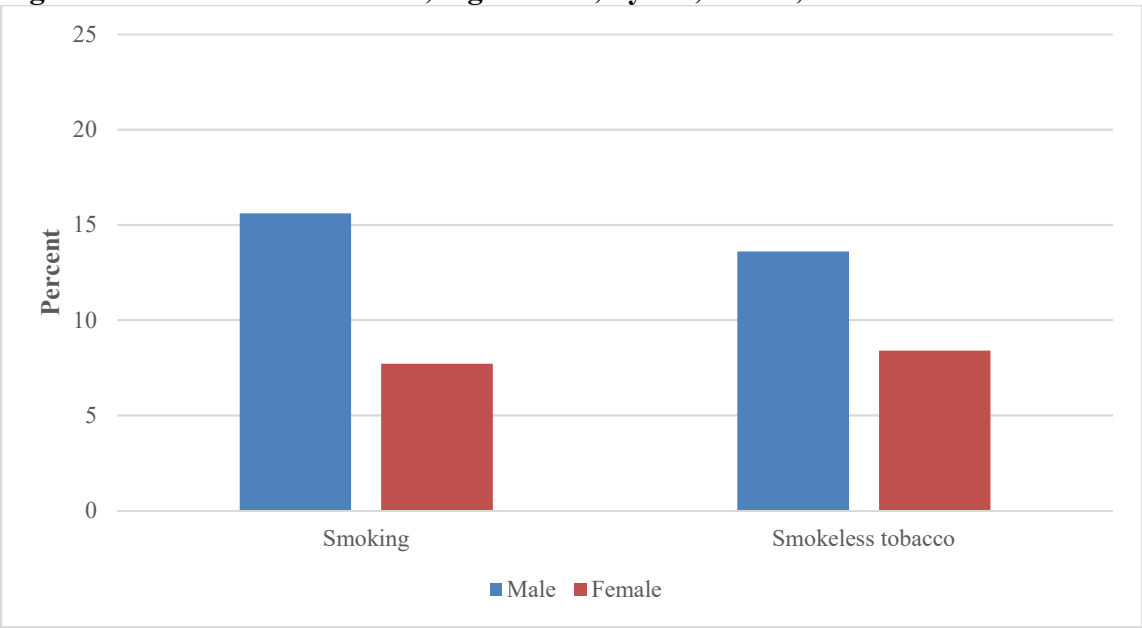
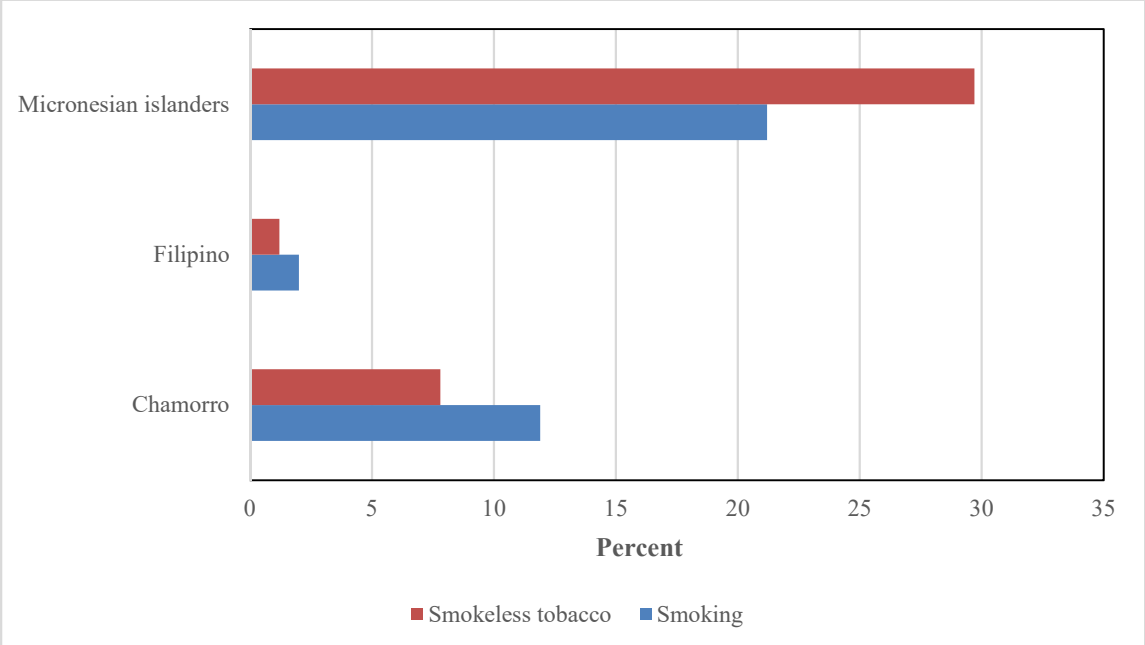


Figure 19. Current tobacco use, high school by ethnicity, Guam, 2019



Source: YRBS 2019
Note: YRBS still uses the old spelling of "Chamorro"

Quit attempts

The percentage of current smokers who tried to quit for at least one day in the past year is significantly higher in Guam than in the U.S., for both adult and youth tobacco users (Table 18). In 2019, the youth quit attempt rate met the HP 2020 target, while the adult rate fell short. Majority of Guam smokers and smokeless tobacco users want to quit, signaling the need to intensify the provision of cessation services.

Table 20 outlines the percent of tobacco users who were offered cessation advice and resources by their primary care physician and the extent of their awareness of cessation services in 2019. The data indicate the ongoing need for cessation services to support those who desire to quit using tobacco.

Table 20. Provision of cessation advice and awareness of cessation resources among adult tobacco users in Guam, 2019

Indicator	Percent
Advice to quit smoking provided by a health professional in the past year	52.8%
Referral to a cessation class provided by a health professional in the past year	77.6%
Referral to a telephone Quitline service provided by a health professional in the past year	96.5%
Aware only of the telephone Quitline service	22.2%
Aware only of local cessation classes	4.6%
Aware of both telephone Quitline and local cessation classes	52.0%

Source: 2019 BRFSS, as State-added questions commissioned by GBHWC.

E-cigarette use

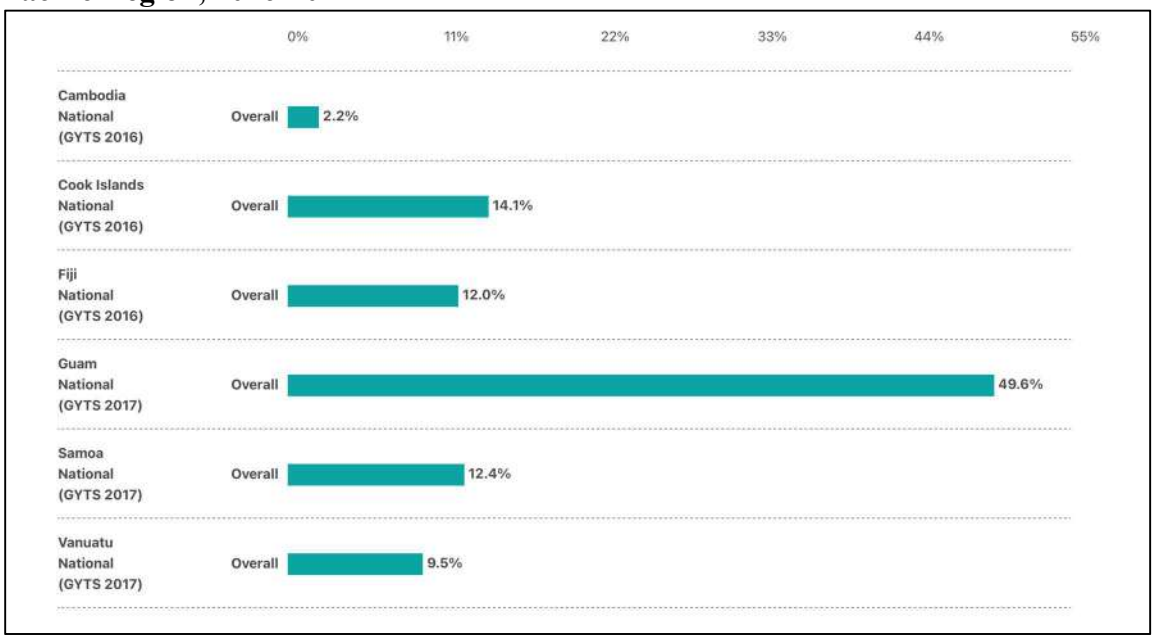
Table 21. E-cigarette use, Guam vs. USA, 2017-2019

Domain	Indicator	Source	Guam	USA	HP 2020 target
E-cig use	Current e-cigarette use, adults	2019 BRFSS	11%	4.6%	-
	Current e-cigarette use, high school youth	2019 YRBS	35.2%	32.7%	-

Note: Adult e-cigarette use from 2019 BRFSS, as a State-added question commissioned by GBHWC. US median data from 2017 BRFSS

E-cigarettes and other electronic smoking devices were not widely available in Guam during the initial CHA in 2014. However, these products eventually penetrated the Guam retail market and have become readily accessible. Questions on e-cigarette use were added to the BRFSS in 2017 and to the YRBS in 2015. At present, more than a third of high school students in Guam are current users of e-cigarettes (Table 21). This is one of the highest reported rates within the Western Pacific Region.

Figure 20. Ever tried e-cigarette, 13–15-year-old, selected countries in the Western Pacific Region, 2016-2017



Sources: GYTS 2016-2017

Alcohol use

Guam has met the HP 2020 targets for adult and youth binge drinking (Table 22). Rates have decreased from the 2011 baseline (Table 23).

Table 22. Alcohol use indicators, Guam vs. USA, 2019-2020

Domain	Indicator	Source	Guam	USA	HP 2020 target
Alcohol use	Binge drinking prevalence, adults	2020 BRFSS	16.2%	15.7%	24.4%
	Binge drinking prevalence, youth	2019 YRBS	8.2%	13.7%	8.6%

Table 23. Alcohol use indicators, Guam vs. USA, 2011-2020

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Alcohol use	Binge drinking prevalence, adults	2011 BRFSS	18.3%	16.2%	2020 BRFSS
	Binge drinking prevalence, youth	2011 YRBS	13.6%	8.2%	2019 YRBS

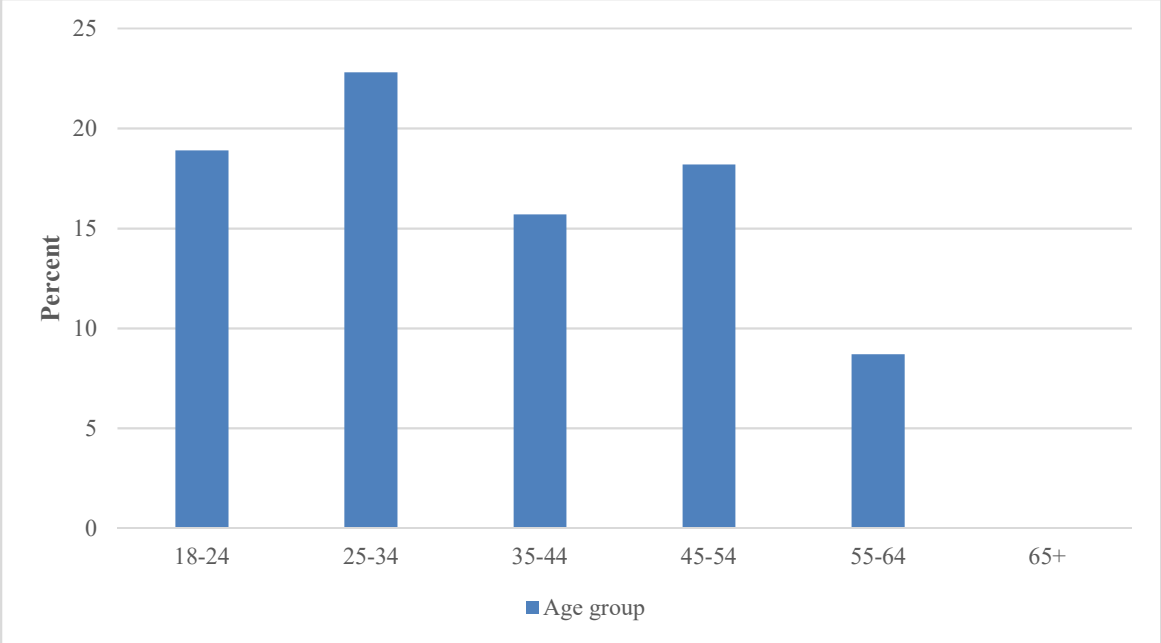
Binge drinking, adults

Binge drinking was reported by 16.2% of adults in Guam in 2019, which surpasses the HP 2020 target of 24.4%. The binge-drinking rate in Guam was increasing until 2010, when it dropped for the 1st time since 2001. In 2010, the minimum legal age for alcohol consumption was raised from 18 to 21 years. 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.

Males in Guam had a rate of binge drinking that was about 3 times higher than women in Guam (24.2% vs. 8%). Binge drinking was highest among younger adults (<35 years) and dropped rapidly after 55 years (Figure 20). The relationship between binge drinking and income, and binge drinking and education are less clear-cut.

Figure 21. Binge drinking, adults by age, Guam, 2020



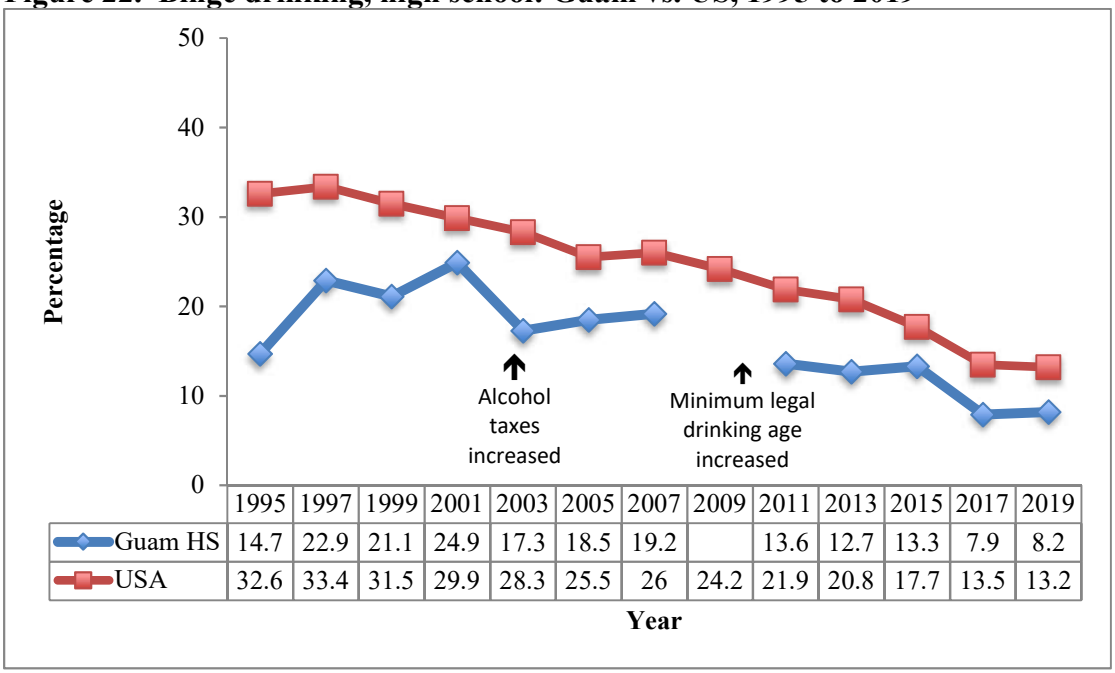
Source: Guam BRFSS, 2020

Binge drinking, youth

In general, binge drinking among youth is lower on Guam than on the U.S. In 2005, the binge drinking rate decreased for the first time since 1995, following the legislated increase in taxes on alcohol products. In 2011, the high school binge drinking rate in Guam dropped further after the law raising the minimum legal age for alcohol consumption from 18 to 21 years was passed in 2010. It has continued to trend downward.

Unlike adults, there is no discernible sex difference in binge drinking among youth; boys and girls report binge drinking at the same rate (7.9% vs. 8.6%). Filipino youth have the lowest rates for binge drinking, while Micronesian youth have the highest (Figure 21).

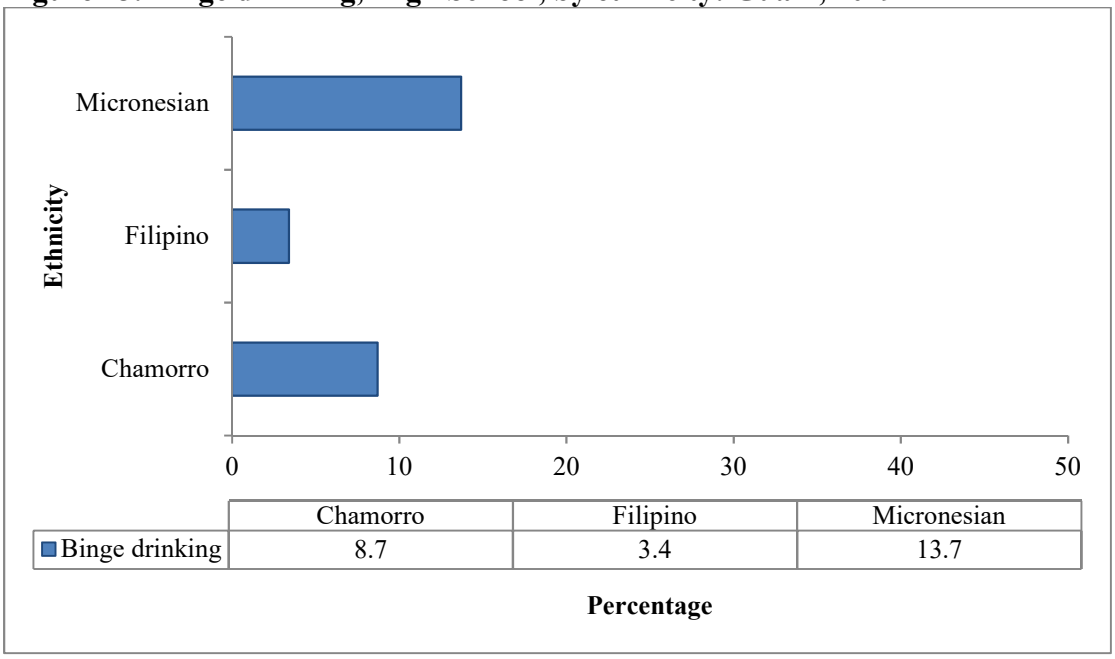
Figure 22. Binge drinking, high school: Guam vs. US, 1995 to 2019



	1995	1997	1999	2001	2003	2005	2007	2009	2011	2013	2015	2017	2019
Guam HS	14.7	22.9	21.1	24.9	17.3	18.5	19.2		13.6	12.7	13.3	7.9	8.2
USA	32.6	33.4	31.5	29.9	28.3	25.5	26	24.2	21.9	20.8	17.7	13.5	13.2

Source: YRBS 1995-2019

Figure 23. Binge drinking, High School, by ethnicity: Guam, 2019



	Chamorro	Filipino	Micronesian
Binge drinking	8.7	3.4	13.7

Source: YRBS 2019

Other drug use

Table 24. Other drug use indicators, Guam vs. USA, 2019

Domain	Indicator	Source	Guam	USA	HP 2020 target
Other drug use	Past year marijuana use, adults		NA	17.5%*	-
	30-day marijuana use, youth	2019 YRBS	25.9%	23.1%	6.0%
	Past year other illicit drug use, adults		NA	20.8%*	-
	Cocaine use prevalence, youth	2019 YRBS	5.2%	3.0%	-
	Past year methamphetamine use, adults		NA	0.7%*	-
	Methamphetamine use youth	2019 YRBS	5.6%	3.8%	-
	Inhalants use, youth	2019 YRBS	9.2%	11.4%	-
	Steroid, youth	2019 YRBS	4.0%	3.6%	-
	Past year prescription pain medicine use without a prescription	2019 BRFSS (SAQ)	4.3%	3.5%*	-
	Lifetime prescription pain medicine use without a prescription, youth	2019 YRBS	15.5%	7.2%	-

Note: NA = not available; "- " = no HP 2020 target established; SAQ = State added question
Source: * - NSDUH 2019, for those aged 12 and over

Table 25. Other drug use indicators, Guam, current and baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Other drug use	30-day marijuana use, adults	2011 BRFSS	17.0%		
	30-day marijuana use, youth	2011 YRBS	32.0%	25.9%	2019 YRBS
	Lifetime other illicit drug use, adults	2011 BRFSS	4.4%		
	Cocaine use prevalence, youth	2011 YRBS	2.9%	5.2%	2019 YRBS
	Lifetime methamphetamine use, adults	2011 BRFSS	5.0%		
	Methamphetamine use youth	2011 YRBS	3.2%	5.6%	2019 YRBS
	Inhalants use, youth	2011 YRBS	8.5%	9.2%	2019 YRBS
	Steroid, youth	2011 YRBS	3.4%	4.0%	2019 YRBS
	Current prescription pain medicine use without a prescription			4.3%	2019 BRFSS
	Lifetime prescription pain medicine use without a prescription, youth	2017 YRBS	10.90%	15.5%	2019 YRBS

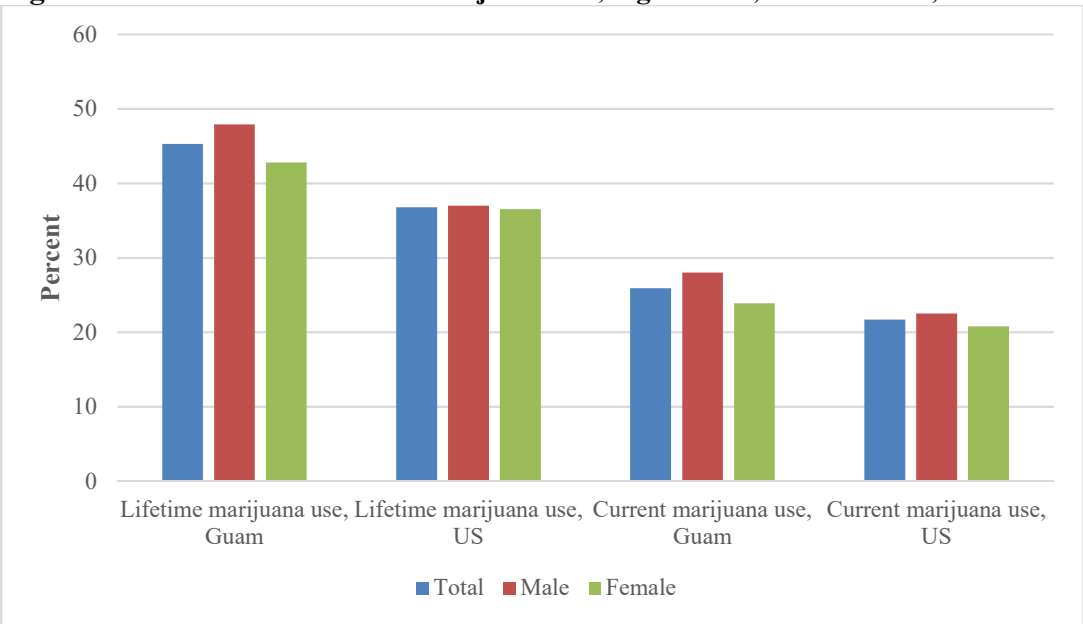
Guam youth surpass U.S. mainland youth in the use of marijuana and lifetime use of prescription pain medicine without a prescription. Guam is far from the HP 2020 target for current marijuana use. However, marijuana use has decreased from the 2011 baseline. The prevalence rates of methamphetamine, cocaine, and inhalant use for youth are lower in Guam than in the U.S. (Table 24), but cocaine and methamphetamine use in the island have increased from 2011 (Table 25).

Marijuana use, youth

Lifetime and current marijuana use among Guam's youth remain higher than among U.S. youth (Figure 23). Nearly half of all high school students had tried marijuana, and nearly

one-fourth had used marijuana within 30 days of the survey. No apparent sex difference is noted.

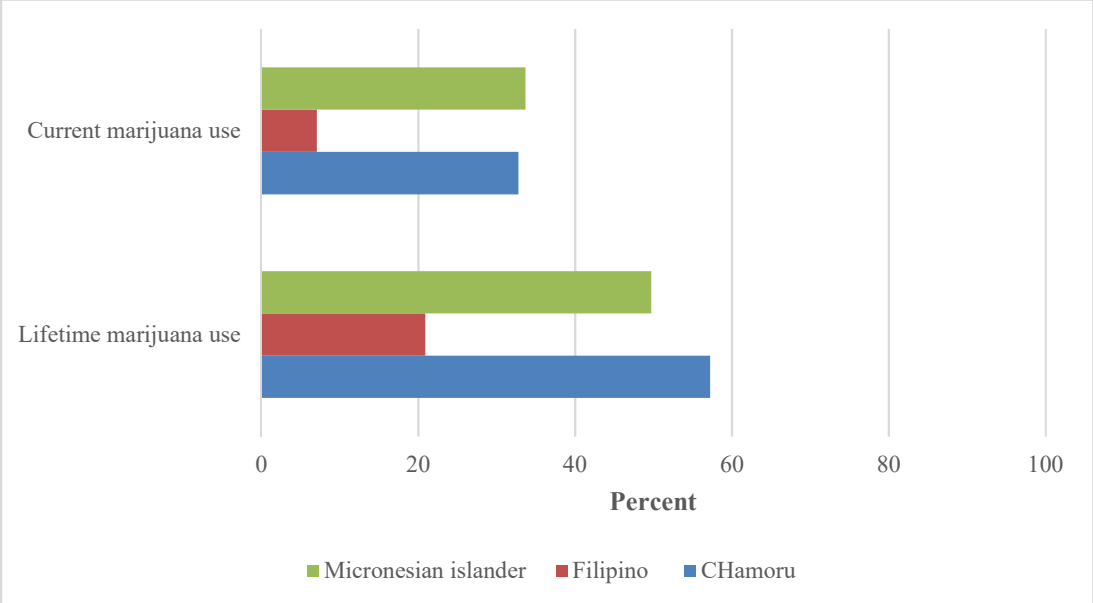
Figure 24. Lifetime and current marijuana use, high school, Guam vs. US, 2019



Source: YRBS 2019

Marijuana use is highest among CHamoru and Micronesian islander youth and lowest for Filipino youth (Figure 24).

Figure 25. Lifetime and current marijuana use, high school, by ethnicity, Guam, 2019



Source: YRBS 2019

Physical activity

Guam adults match U.S. adults for physical activity and meet the HP 2020 target. However, Guam youth report less physical activity than U.S. youth (Table 26).

Table 26. Physical activity indicators, Guam vs. USA, 2019

Domain	Indicator	Source	Guam	USA	HP 2020 target
Physical activity (PA)	% Adults with enough PA to meet guidelines	2019 BRFSS	20.9%	22.8%	20.1%
	% Youth reporting at least 60 mins. of PA/day for 5-7 days a week	2019 YRBS	32.1%	44.1%	-

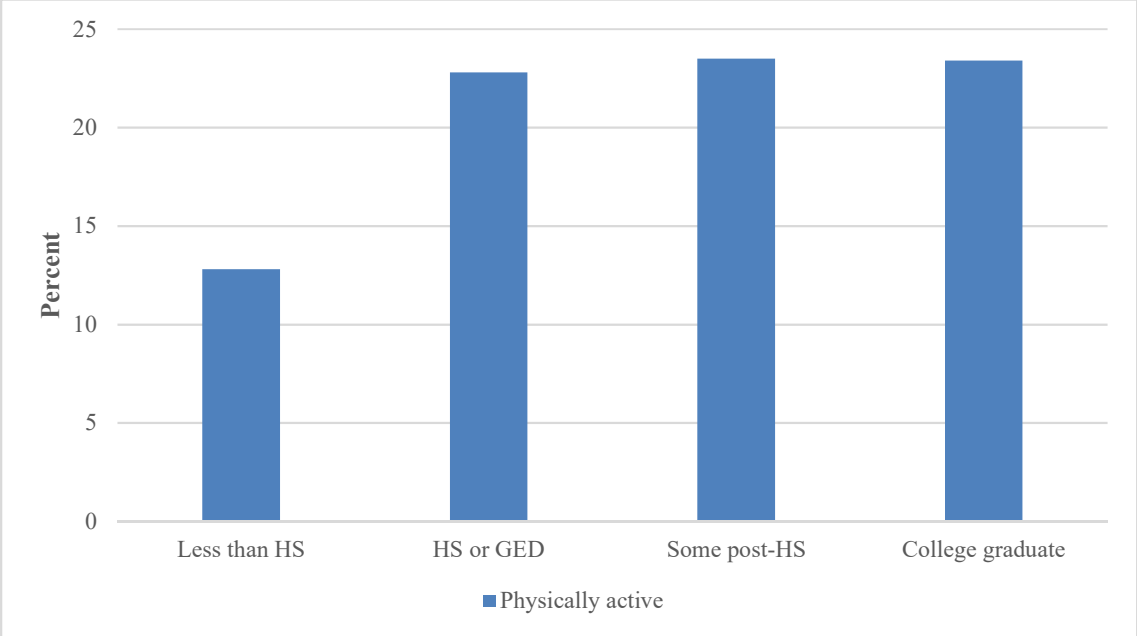
Note: "-"= no HP 2020 target established

Table 27. Physical activity indicators, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Physical activity (PA)	% Adults with enough PA to meet guidelines	2011 BRFSS	20.4%	20.9%	2019 BRFSS
	% Youth reporting at least 60 mins. of PA/day for 5-7 days a week	2011 YRBS	37.4%	32.1%	2019 BRFSS

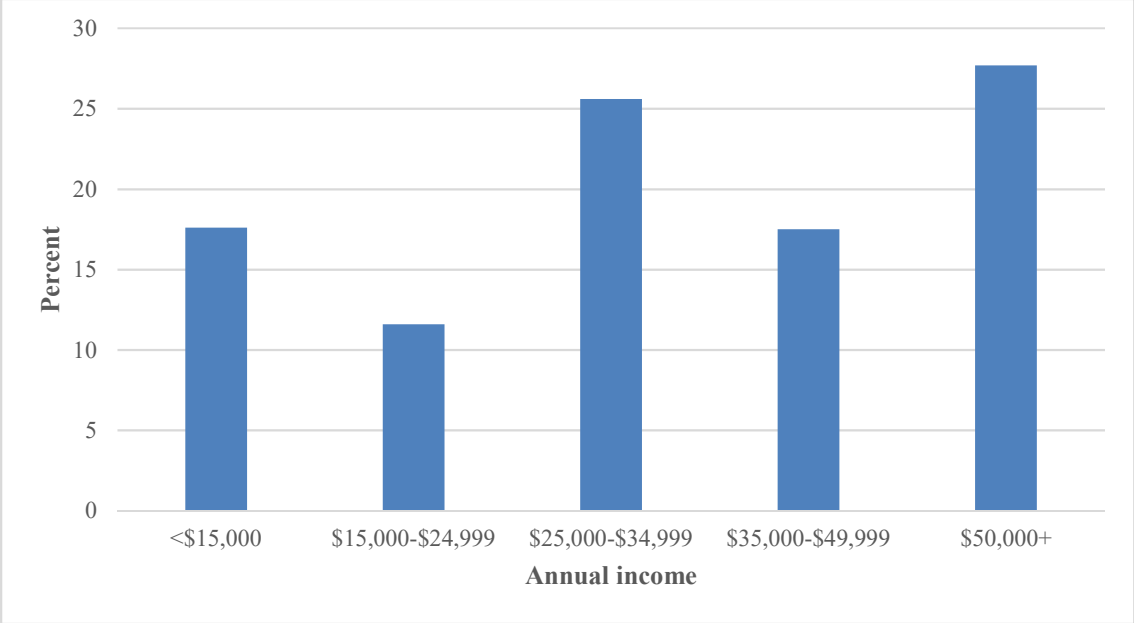
Adult men are more likely to be physically active than adult women (25.8% vs. 16%). Higher education and income appear to be associated with higher levels of physical activity (Figures 25-26).

Figure 26. Physical activity, by education, adults, Guam, 2019



Source: 2019 BRFSS

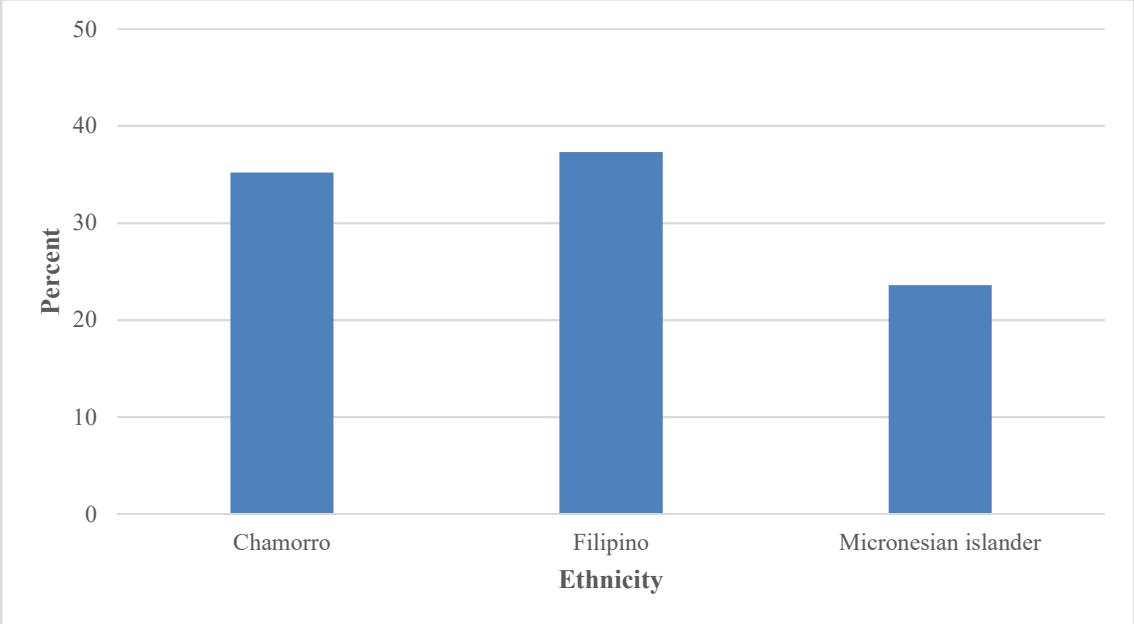
Figure 27. Physical activity, by income, adults, Guam, 2019



Source: 2019 BRFSS

Among Guam youth, males report higher levels of physical activity than females (37.3% vs. 26.5%). Micronesian Islanders report the lowest levels of physical activity (Figure 27).

Figure 28. Physical activity, high school youth, Guam, by ethnicity, 2019



Source: Guam YRBS 2019

Nutrition

Among Guam adults, consumption of fruits and vegetables is similar to the U.S. median. Guam youth are less likely than U.S. youth to report drinking soda in the last 7 days (Table 28).

Table 28. Nutrition indicators, Guam vs. USA, 2019

Domain	Indicator	Source	Guam	USA	HP 2020 target
Nutrition	% Consuming 5 or more fruits/veg per day, adults*	2010 BRFSS	24.3%	23.5%	-
	% consuming vegetables one or more times a day	2019 BRFSS	73%	79.6%	-
	% consuming fruit one or more times a day	2019 BRFSS	51%	60.2%	-
	% Youth drinking soda one or more times a day in the past 7 days	2019 YRBS	15.2%		-

Note: "-" = no HP 2020 target established; *This indicator was modified after 2009.

Table 29. Nutrition indicators, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Nutrition	% Consuming 5 or more fruits/veg per day, adults*	2010 BRFSS	24.3%		-
	% consuming vegetables one or more times a day			73%	2019 BRFSS
	% consuming fruit one or more times a day			51%	2019 BRFSS
	% Youth drinking soda one or more times a day in the past 7 days	2011 YRBS	18.8%	15.2%	2019 YRBS

Note: "-" = no HP 2020 target established; *This indicator was modified after 2009

No discernible differences by sex, education or income were noted for fruit and vegetable consumption among adults. Among youth, boys were more likely to drink soda (19% vs. 11.1%). Micronesian islanders were most likely to consume soda (24.3%) compared to CHamoru (14.6%) or Filipino (7.3%) youth.

Obesity

Guam adults have rates of overweight and obesity similar to U.S. adults. Among youth, rates of overweight are similar, but the obesity rate has increased over time and is now higher than the U.S. rate (Table 30).

Table 30. Obesity indicators, Guam vs. USA, 2019-2020

Domain	Indicator	Source	Guam	USA	HP 2020 target
Obesity	% Overweight, adults	2020 BRFSS	32.6%	35.2%	-
	% Obese, adults	2020 BRFSS	34.4%	31.9%	30.5%
	% Overweight, youth	2019 YRBS	18.3%	16.1%	-
	% Obese, youth	2019 YRBS	23.8%	15.5%	-

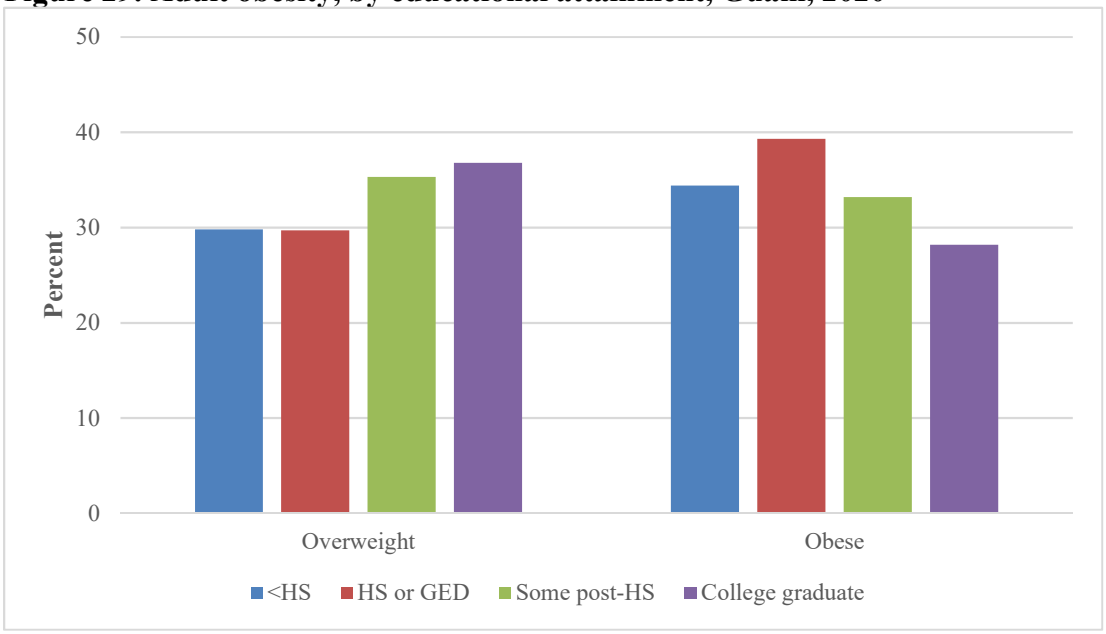
Note: "-"= no HP 2020 target established

Table 31. Obesity indicators, Guam, Current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Obesity	% Overweight, adults	2011 BRFSS	36.6%	32.6%	2020 BRFSS
	% Obese, adults	2011 BRFSS	27.4%	34.4%	2020 BRFSS
	% Overweight, youth	2011 YRBS	16.5%	18.3%	2019 YRBS
	% Obese, youth	2011 YRBS	15.4%	23.8%	2019 YRBS

Adult men are more likely to be overweight, but no sex difference is observed for obesity in adults. Overweight increases with educational attainment, but obesity is lowest among those with a college degree.

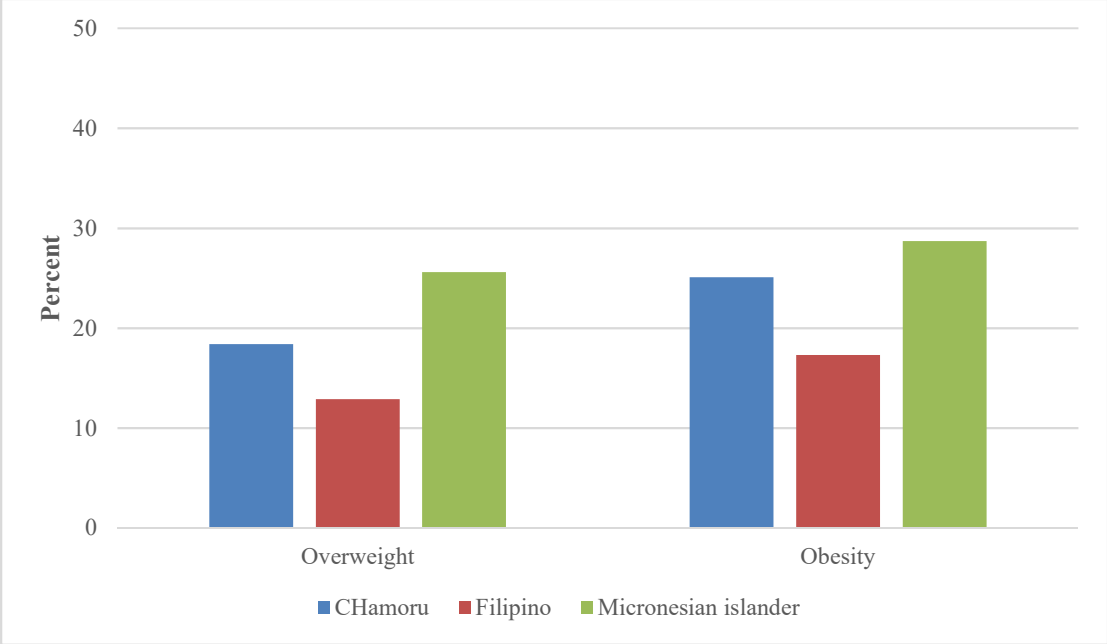
Figure 29. Adult obesity, by educational attainment, Guam, 2020



Source: 2020 BRFSS

Overweight among youth is more prevalent among females, but obesity was similar across the sexes. Filipino youth are least likely to be overweight or obese; CHamoru and other Micronesian youth are more likely to be obese (Figure 30).

Figure 30. Youth overweight and obesity, by ethnicity, Guam 2019



Source: Guam YRBS 2019

Hypertension and cholesterol levels

Guam adults are less likely to have been diagnosed with high cholesterol than their U.S. counterparts (Table 32). Cholesterol diagnosis has decreased over time but reported hypertension has increased. The data are based on self-reporting, and recall bias is possible. It is unknown if the difference is due to lower prevalence of these conditions in the Guam adult population or to lower rates of screening for these intermediate NCD risk factors. Guam has not met the HP 2020 targets for these conditions.

Table 32. Hypertension and cholesterol levels, adults, Guam vs. USA, 2019

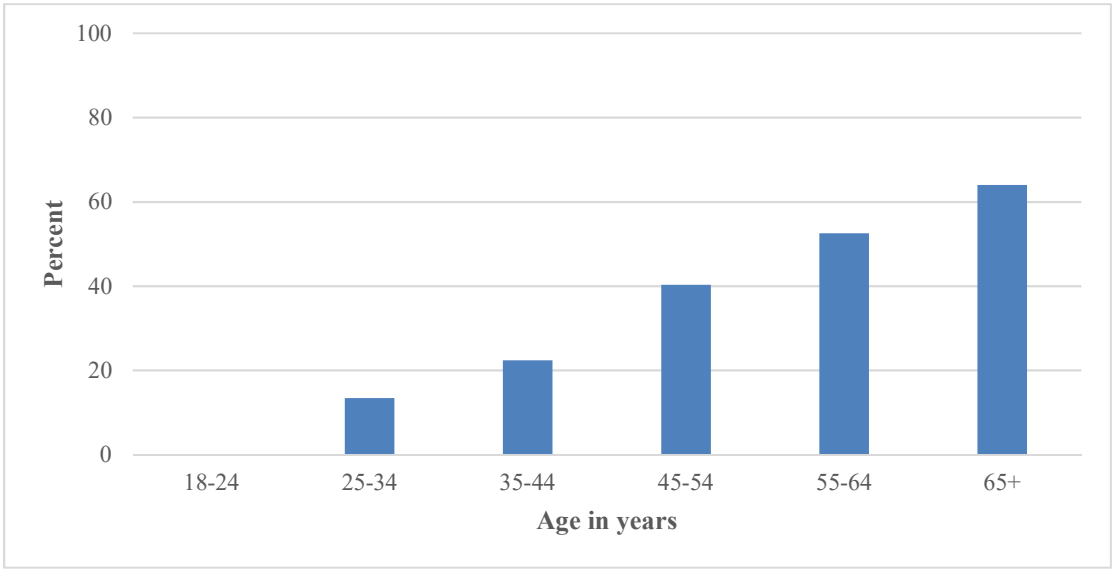
Domain	Indicator	Source	Guam	USA	HP 2020 target
Hypertension	% Diagnosed with Hypertension, adults	2019 BRFSS	30.3%	32.3%	26.9%
High Cholesterol	% Diagnosed with high cholesterol, adults	2019 BRFSS	28.7%	33.1%	13.5%

Table 33. Hypertension and cholesterol levels, adults, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Hypertension	% Diagnosed with Hypertension, adults	2011 BRFSS	20.8%	30.3%	2019 BRFSS
High Cholesterol	% Diagnosed with high cholesterol, adults	2011 BRFSS	33.1%	28.7%	2019 BRFSS

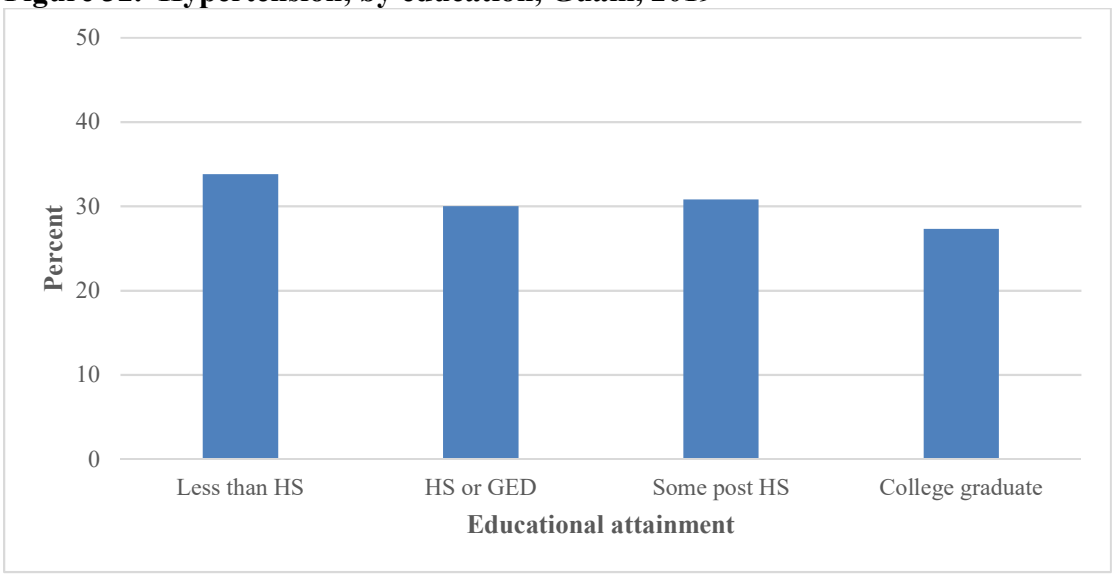
Hypertension is more frequently reported by men (32.6% vs. 28%). Hypertension increases with age; over half of those aged 55 and older have been diagnosed with hypertension (Figure 30). Education and income appear to be inversely related to hypertension diagnosis (Figures 31-32).

Figure 31. Hypertension, by age, Guam, 2019



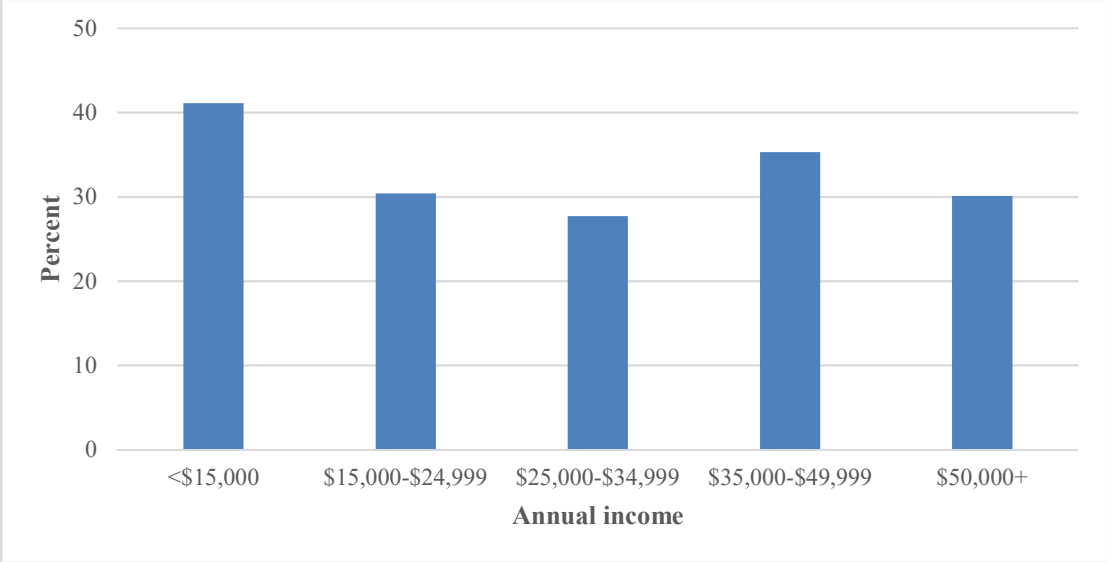
Source: BRFSS, 2019

Figure 32. Hypertension, by education, Guam, 2019



Source: BRFSS, 2019

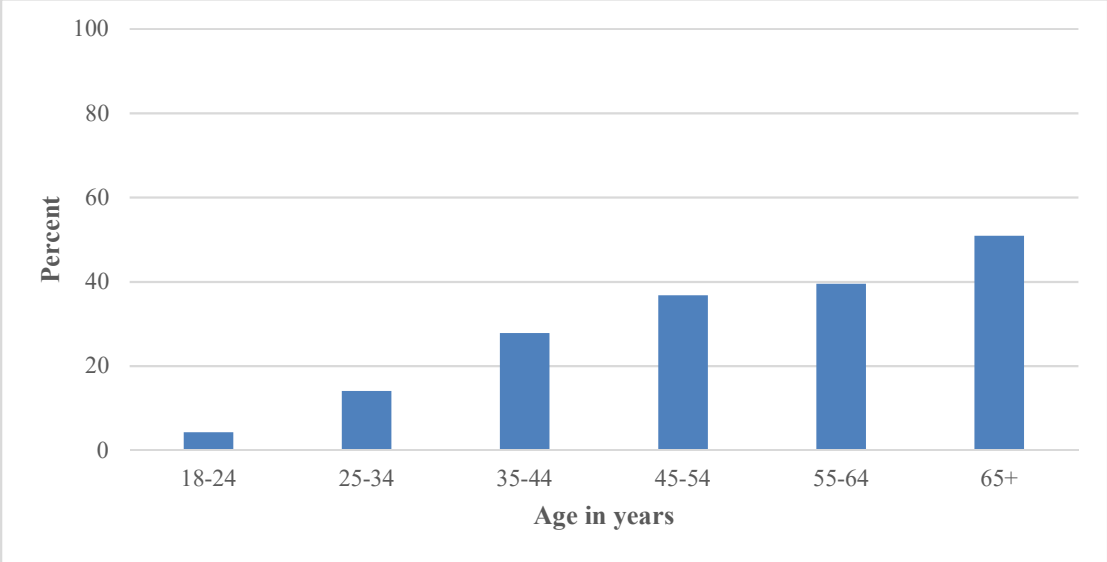
Figure 33. Hypertension, by income, Guam, 2019



Source: BRFSS, 2019

Men are more likely to be diagnosed with high cholesterol (31% vs. 26.3%). As expected, being diagnosed with high cholesterol increases with age; over half of adults 65 years and older report having high cholesterol (Figure 33). Education and income do not appear to affect the likelihood of having high cholesterol.

Figure 34. High cholesterol, by age, Guam, 2019



Source: BRFSS, 2019

Cancer screening

Women in Guam are less likely than their U.S. counterparts to have had a recent mammogram or Pap smear, men are less likely to have had a Prostate-Specific Antigen (PSA) test and adults in Guam are less likely to have had a colonoscopy to screen for colon cancer. Guam has not met the HP 2020 targets for cancer screening (Table 34).

Table 34. Cancer screening rates, Guam vs. USA, 2020

Domain	Indicator	Source	Guam	USA	HP 2020 target
Cancer screening	% Women 40+ who had a mammogram in past 2 years	2020 BRFSS	59.4%	71.5%	-
	% Women 50+ who had a mammogram in past 2 years	2020 BRFSS	72.3%	78.3%	81.1%
	% Women 21-65 who had a pap smear within the past 3 years*	2020 BRFSS	68.0%	77.7%	93%
	% Adults 50-75 who have had a colonoscopy within 10 yrs.*	2020 BRFSS	37.5%	64.3%**	70.5%
	% Men 40+ who had PSA test within past 2 years*	2020 BRFSS	16.1%	31.8%	-

Note: * - These are revised indicators in the BRFSS that differ from the original CHA indicators: 88 – latest data from 2018 BRFSS "-" = no HP 2020 target established; "NA" = not available

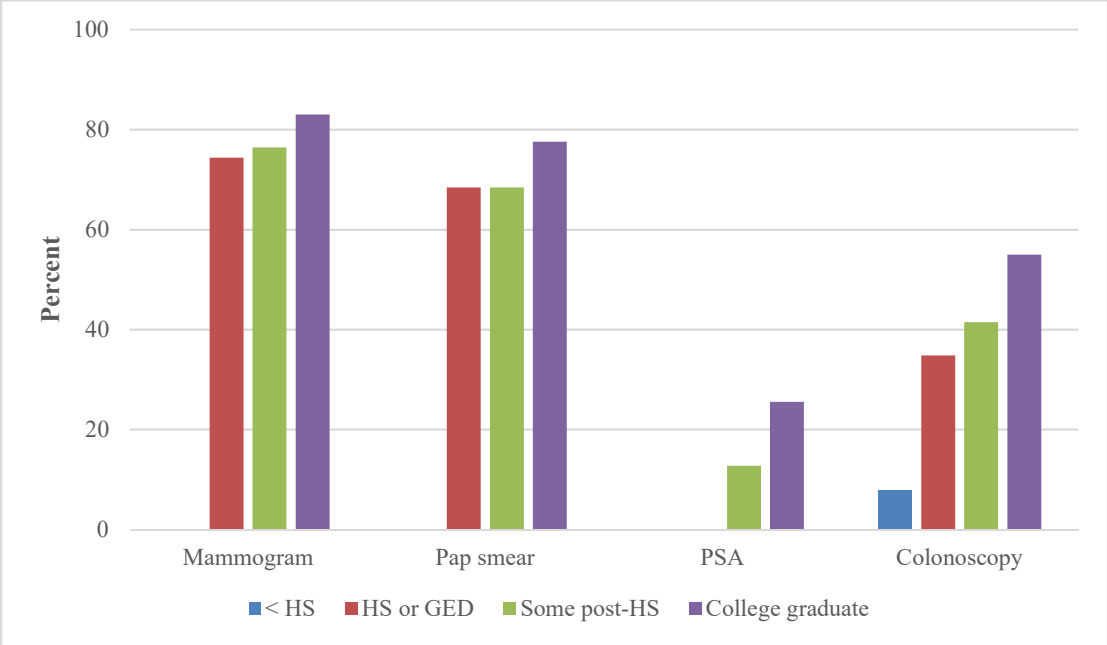
Table 35. Cancer screening rates, Guam, Current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Cancer screening	% Women 40+ who had a mammogram in past 2 years	2010 BRFSS	64.4%	59.4%	2020 BRFSS
	% Women 50+ who had a mammogram in past 2 years	2010 BRFSS	71.4%	72.3%	2020 BRFSS
	% Women 18+ who had a pap smear within past 3 years*	2010 BRFSS	67.8%		
	% Women 21-65 who had a pap smear within the past 3 years**			68.0%	2020 BRFSS
	% Adults 50+ who have had a colonoscopy/sigmoidoscopy*	2010 BRFSS	37.8%		
	% Adults 50-75 who have had a colonoscopy within 10 yrs.**			37.5%	2020 BRFSS
	% Men 50+ who had prostate cancer screening*	2011 BRFSS	28.3%		
	% Men 40+ who had PSA test within past 2 years**			16.1%	2020 BRFSS

Note: *These questions was not asked in 2010; ** - These are revised indicators in the 2020 BRFSS "-" = no HP 2020 target established; "NA" = not available

Women with college degrees were more likely than high school graduates to have had a recent mammogram or Pap smear. Likewise, college educated men were more likely to have had a recent PSA test. College-educated adults were much more likely to have had a colonoscopy than those with lower educational attainment. Income had a similar relationship to cancer screening (Figure 34). No sex difference was noted for colon cancer screening.

Figure 35. Women 50-75 years who have had a recent mammogram or Pap smear, men 50+ years who have had a recent PSA test and adults who have had a colonoscopy, by education, Guam 2020



Source: BRFSS, 2020

Depression

Guam youth are more likely than U.S. youth to report symptoms of depression, while Guam adults are less likely to report being diagnosed with depression than their U.S. counterparts (Table 36). The percentage of youth reporting depressive symptoms has increased since the 2011 baseline. Guam has not met the HP 2020 targets for depression.

Table 36. Depression, youth and adults, Guam vs. USA, 2019-2020

Domain	Indicator	Source	Guam	USA	HP 2020 target
Depression	% Feeling sad > 2 weeks in past year, youth	2019 YRBS	46.9%	36.7%	7.4%
	% Diagnosed with depression, adults	2020 BRFSS	9.1%	19.2%	5.8%

Table 37. Depression, youth and adults, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Depression	% Feeling sad > 2 weeks in past year, youth	2011 YRBS	36.2%	46.9%	2019 YRBS
	% Diagnosed with depression, adults	2011 BRFSS	7.6%	9.1%	2020 BRFSS

Women are more likely than men to have been told they have depression (11% vs. 7.2%). No clear relationship exists between depression and age, education, or income in adults.

Among youth, females are more likely than males to report depressive symptoms (58.9% vs. 36.9%). Depressive symptoms appear to be equally distributed across ethnic groups, grade level, and age.

Violence

Guam youth report similar rates of physical and sexual violence as youth in the U.S. mainland (Table 38). Electronic bullying appears to be declining in Guam, but not sexual or physical dating violence.

Table 38. Violence indicators, Guam vs. USA, 2019

Domain	Indicator	Source	Guam	USA	HP 2020 target
Violence	Physical violence: % youth experiencing physical dating violence	2019 YRBS	7.6%	8.2%	-
	Sexual violence: % youth forced to have sex	2019 YRBS	9.0%	7.3%	-
	% Youth electronically bullied	2019 YRBS	12.4%	15.7%	-
	Family violence rate	2018 UCR GPD	4.8/1000	NA	-
	Child abuse - # of reported cases to CPS	2019 BPS Guam Statistical Yearbook	1323	NA	-

Note: "-" = no HP 2020 target established; "NA" = not available

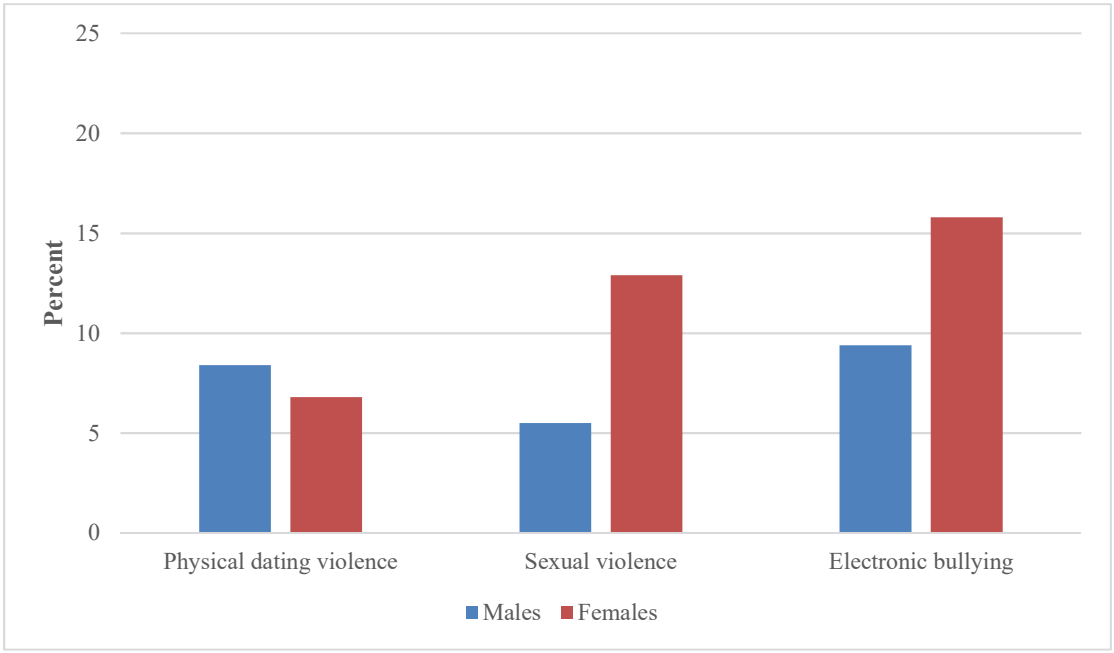
Table 39. Violence indicators, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Violence	Physical violence: % youth hit by a partner*	2011 YRBS	15.0%		
	Physical violence: % youth experiencing physical dating violence			7.6%	2019 YRBS
	Sexual violence: % youth forced to have sex	2011 YRBS	10.7%	9.0%	2019 YRBS
	% Youth electronically bullied	2011 YRBS	17.9%	12.4%	2019 BRFSS
	Family violence rate	2010 UCR GPD	3.1/1000	4.8/1000	2018 UCR GPD
	Child abuse - # of reported cases to CPS	2011 DPHSS data	3294	1323	2019 Guam Statistical Yearbook

Note: * - This indicator was modified in later versions of the YRBS

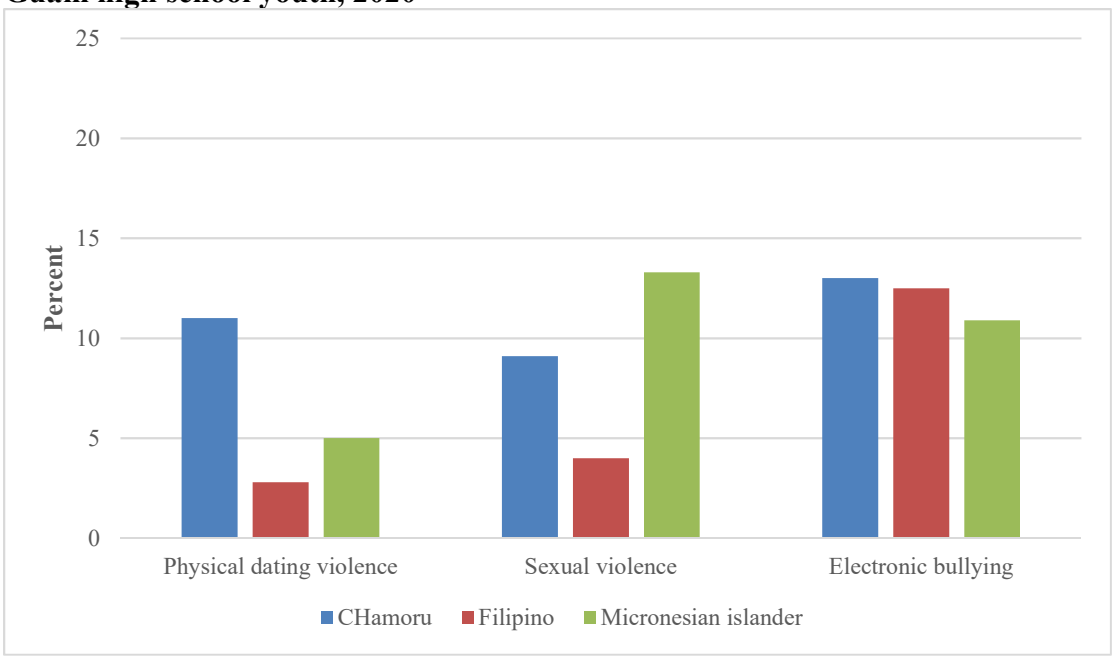
Girls are more likely to report sexual violence and electronic bullying than boys (Figure 35). CHamoru youth are more likely to experience physical dating violence, while Micronesian islander youth are more likely to report being forced to have sex (Figure 36).

Figure 36. Physical dating and sexual violence and electronic bullying, by sex, Guam high school youth, 2020



Source: YRBS 2019

Figure 37. Physical dating and sexual violence and electronic bullying, by ethnicity, Guam high school youth, 2020



Source: YRBS 2019

Homelessness

The percent of the total population that is homeless is higher in Guam than in the U.S. (Table 40). However, the rate and number of homeless have diminished since 2011 (Table 41).

Table 40. Homelessness indicators, Guam vs. USA, 2018

Domain	Indicator	Source	Guam	USA	HP 2020 target
Homelessness	Number of homeless persons (% of population)	2018 BSP	854 (0.5%)	553,742* (0.2%)	-
	Homeless rate (per 10,000 people)	2018 BSP	52	17	-

Note: * US statistics taken from "State of Homelessness in America", published by the National Alliance to End Homelessness from data of the US Department of Housing and Urban Development at https://endhomelessness.org/homelessness-in-america/homelessness-statistics/state-of-homelessness-report-legacy/ "-" = no HP 2020 target established

Table 41. Homelessness indicators, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Homelessness	Number of homeless persons (% of population)	2010 Census	1789 (1.1%)	854	2018 BSP
	Homeless rate (per 10,000 people)	2010 Census	81	52	2018 BSP

What's our health status?

This section presents data on wellness, morbidity, mortality, and health care infrastructure.

Wellness

Life expectancy is lower in Guam than the U.S., for both males and females. Life expectancy decreased in Guam for both sexes from the baseline in 2011. The percentage of adults reporting good or better health in Guam is similar to the U.S. rate (Table 42).

Table 42. Wellness indicators, Guam vs. USA, 2019-2020

Domain	Indicator	Source	Guam	USA	HP 2020 target
Life expectancy	Life expectancy at birth, males	2019 Guam Statistical Yearbook	74.3 yrs.	76.2 yrs.*	-
	Life expectancy at birth, females	2019 Guam Statistical Yearbook	79.3 yrs.	81.2 yrs.*	-
Well-being	% Adults reporting good or better health	2020 BRFSS	83.5%	86.7%	-

Note: "-" = no HP 2020 target established; * From Mortality in the United States, 2018 reported at https://www.cdc.gov/nchs/products/databriefs/db355.htm

Table 43. Wellness indicators, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Life expectancy	Life expectancy at birth, males	DPHSS Vital Statistics	75.3 yrs.	74.3 yrs.	2019 Guam Statistical Yearbook
	Life expectancy at birth, females	DPHSS Vital Statistics	81.6 yrs.	79.3 yrs.	2019 Guam Statistical Yearbook
Well-being	% Adults reporting good or better health	2011 BRFSS	80.60%	83.50%	2020 BRFSS

Note: "-" = no HP 2020 target established

Maternal and child health

Guam has a higher overall birth rate than the U.S. (Table 44), although the birth rate has declined since 2011. The teen pregnancy rate in Guam decreased dramatically from 2011 and is now half of the U.S. rate. Antenatal coverage is slightly lower in Guam than compared to the U.S.

Table 44. Maternal and child health indicators, Guam vs. USA, 2016-2019

Domain	Indicator	Source	Guam	USA	HP 2020 target
Births	Birth rate	2019 Guam Statistical Yearbook	18.3 per 1000	11.4 per 1000*	-
Antenatal care	Antenatal care coverage – early and adequate antenatal care	2018 National Vital Statistics System	69.7% (2018)***	75.6% (2016)**	83.2%
Adolescent health	Teen pregnancy rate (live births per 1000 women aged 15-19)	2019 Guam Statistical Yearbook	8.5/1000	16.7/1000	36.2 pregnancies/1000 (15-17 years)

Note: "-" = no HP 2020 target established; * - Data from Births: Final data for 2019, available at https://www.cdc.gov/nchs/fastats/births.htm; ** - Data from National Vital Statistics System-Natality (NVSS-N), CDC/NCHS 2016; *** - Data from National Vital Statistics System as reported in https://mchb.tvisdata.hrsa.gov/Narratives/AnnualReport1/08312f4f-d1b8-4988-a861-b6aa9678a13e

Table 45. Maternal and child health indicators, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Births	Birth rate	2011 DPHSS Vital Statistics	20.7 per 1000	18.3 per 1000	2019 Guam Statistical Yearbook
Antenatal care	Antenatal care coverage -	2001 data, WHO CHIPs 2010	92.05% at least 1 visit as % of births	69.7%	2018 National Vital Statistics System
Adolescent health	Teen pregnancy rate	DPHSS data, Live births 15-19 yrs.	60.1/1000	8.5/1000	2019 Guam Statistical Yearbook

Note: N/A – data not available

Mental health

Suicide

Guam's suicide mortality is higher than the U.S. (Table 46). Youth in Guam are more likely to think about suicide and to make a suicide attempt than youth in the U.S. The suicide death rate rose from 2011 to 2020 (Table 47).

Table 46. Suicide indicators, Guam vs. USA, 2020

Domain	Indicator	Source	Guam	USA	HP 2020 target
Suicide	Suicide death rate	2020 CME data as analyzed by the Guam SEOW	23.7/100,000	12/100,000*	10.2/100,000
	% Youth reporting suicidal ideation	2019 YRBS	23.8%	15.8%	-
	% Youth with a suicide attempt	2019 YRBS	16.5%	7.8%	-

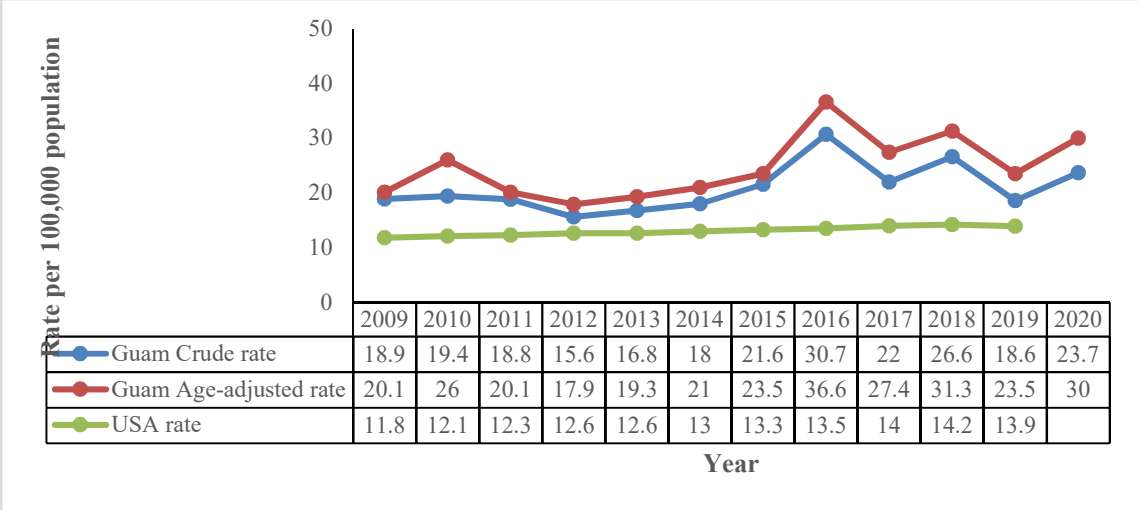
Note: "-" = no HP 2020 target established; * - US data taken from 2010 SAMHSA statistics

Table 47. Suicide indicators, Guam, Current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Suicide	Suicide death rate	2012 CME data as analyzed by the Guam SEOW	15.6/100,000	23.7/100,000	2020 CME data as analyzed by the Guam SEOW
	% Youth reporting suicidal ideation	2011 YRBS	23.20%	23.8%	2019 YRBS
	% Youth with a suicide attempt	2011 YRBS	17%	16.5%	2019 YRBS

In 2020, there were 40 suicide deaths in Guam, resulting in a crude suicide rate of 23.7 per 100,000. Age-adjustment to the U.S. 2000 standard population raised the suicide rate to 30.0 per 100,000. This represents an increase from 2019 (Figure 37).

Figure 38. Annual trend in suicide death rates, Guam, crude and age-adjusted, 2009-2020



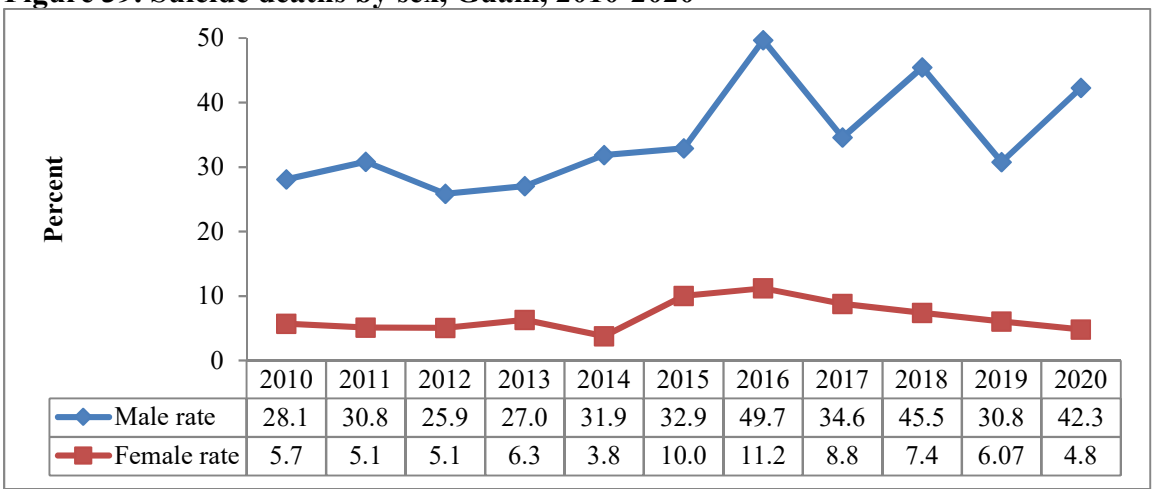
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Guam Crude rate	18.9	19.4	18.8	15.6	16.8	18	21.6	30.7	22	26.6	18.6	23.7
Guam Age-adjusted rate	20.1	26	20.1	17.9	19.3	21	23.5	36.6	27.4	31.3	23.5	30
USA rate	11.8	12.1	12.3	12.6	12.6	13	13.3	13.5	14	14.2	13.9	

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, 2009-2020; US age-adjusted rates from data provided by the Centers for Disease Control and Prevention (CDC) Data & Statistics Fatal Injury Report for 2019, as reported in https://afsp.org/suicide-statistics/

Note: Guam crude data was age-adjusted using direct standardization against the 2000 US Standard Population

Suicide deaths in Guam occur predominantly among males, who consistently outnumber female suicide deaths. In 2020, the ratio of the male suicide rate to the female rate was nearly 9:1 (Figure 38), more than double the 2019 U.S. ratio of 3.6:1. The Guam male suicide rate decreased in 2019 from 2018, narrowing the sex gap briefly, but increased markedly in 2020. In contrast, the female suicide rate decreased slightly from 2019 to 2020, with annual declines noted since 2016. This widened the sex gap.

Figure 39. Suicide deaths by sex, Guam, 2010-2020

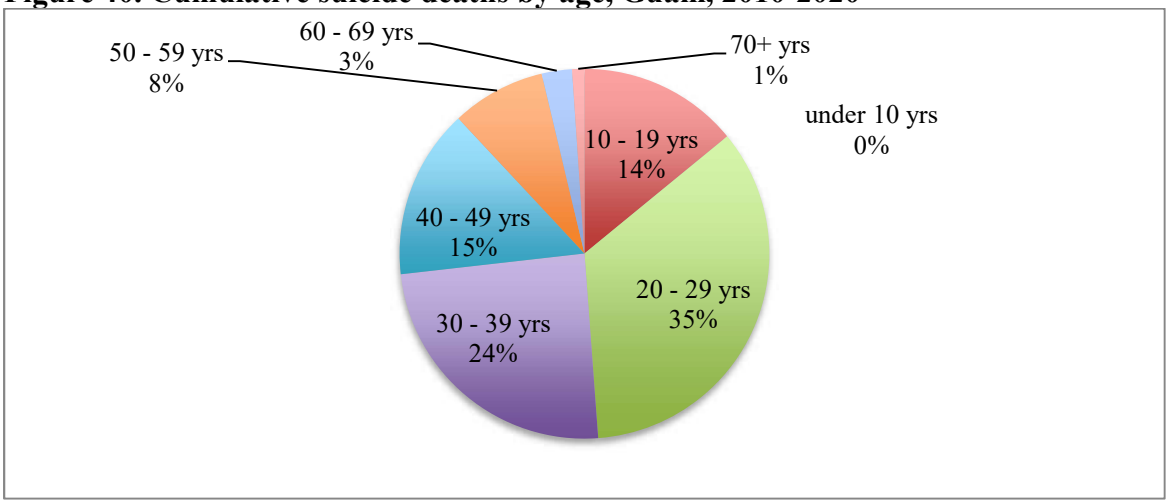


	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Male rate	28.1	30.8	25.9	27.0	31.9	32.9	49.7	34.6	45.5	30.8	42.3
Female rate	5.7	5.1	5.1	6.3	3.8	10.0	11.2	8.8	7.4	6.07	4.8

Sources: Calculated from data provided by the Office of the Chief Medical Examiner and Bureau of Statistics and Plans, 2010-2020

Collectively, nearly half (49%) of all suicide deaths in Guam from 2010-2020 occurred in those younger than 30 years, and almost a quarter (24%) happened among those aged 30-39 years (Figure 39). Thus, deaths by suicide in Guam occur predominantly among young people, unlike in the U.S. mainland.

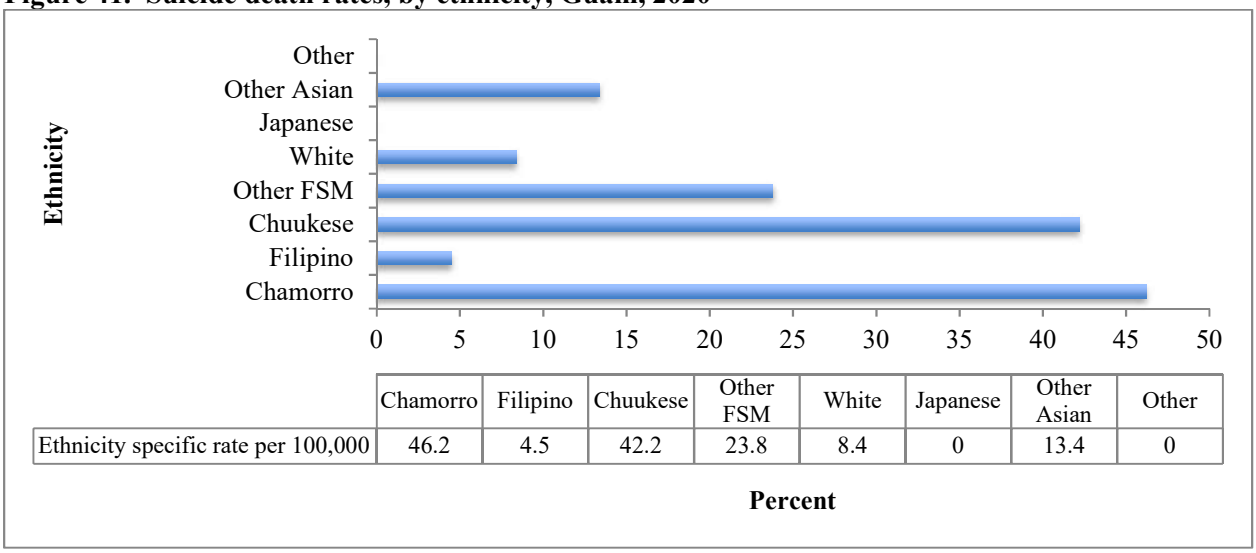
Figure 40. Cumulative suicide deaths by age, Guam, 2010-2020



Sources: Calculated from data provided by the Office of the Chief Medical Examiner, 2010-2020

In 2020, the greatest number of suicide deaths occur among CHamorus, followed by Chuukese. When these are corrected for the relative contribution of each ethnic group to the total population (Figure 40), CHamorus have the highest suicide death rates per 100,000, followed by Chuukese and other Micronesians. In contrast, in the U.S. mainland, Pacific Islanders have the lowest suicide rates. In previous years, Chuukese had higher rates of suicide than CHamorus.

Figure 41. Suicide death rates, by ethnicity, Guam, 2020



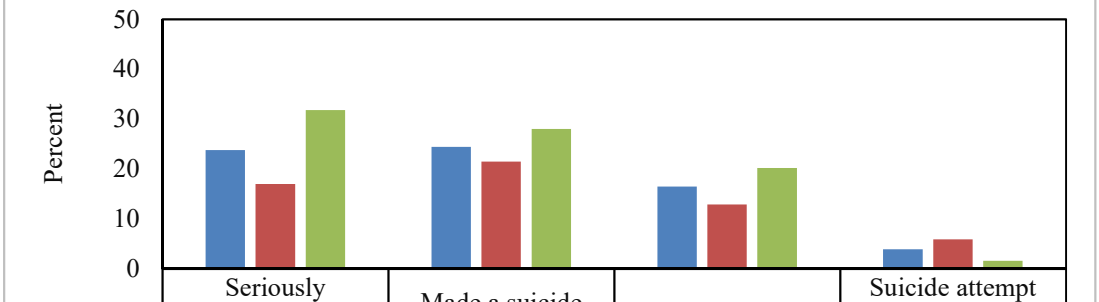
	Chamorro	Filipino	Chuukese	Other FSM	White	Japanese	Other Asian	Other
Ethnicity specific rate per 100,000	46.2	4.5	42.2	23.8	8.4	0	13.4	0

Source: Calculated from data provided by the Office of the Chief Medical Examiner, 2020, and population projections published in the 2018 Guam Statistical Handbook
Note: * = actual numbers for each of these ethnicity categories are small; caution needed in interpretation; the CME database still uses the old spelling "Chamorro"

The Chief Medical Examiner recorded that alcohol was involved in 12% of suicide deaths from 2010 to 2020. Twelve percent had made previous suicide attempts and 14% had a history of mental illness.

Female students are more likely to report thinking about suicide, making a suicide plan, and attempting suicide, but males are more likely to make a serious suicide attempt that requires medical attention (Figure 41). Guam surpasses the US average for youth suicidal ideation and suicidal attempts; this has been the case since 1999 (Figures 42 and 43). CHamoru youth report the highest rates of suicidal ideation and attempts (Figure 44).

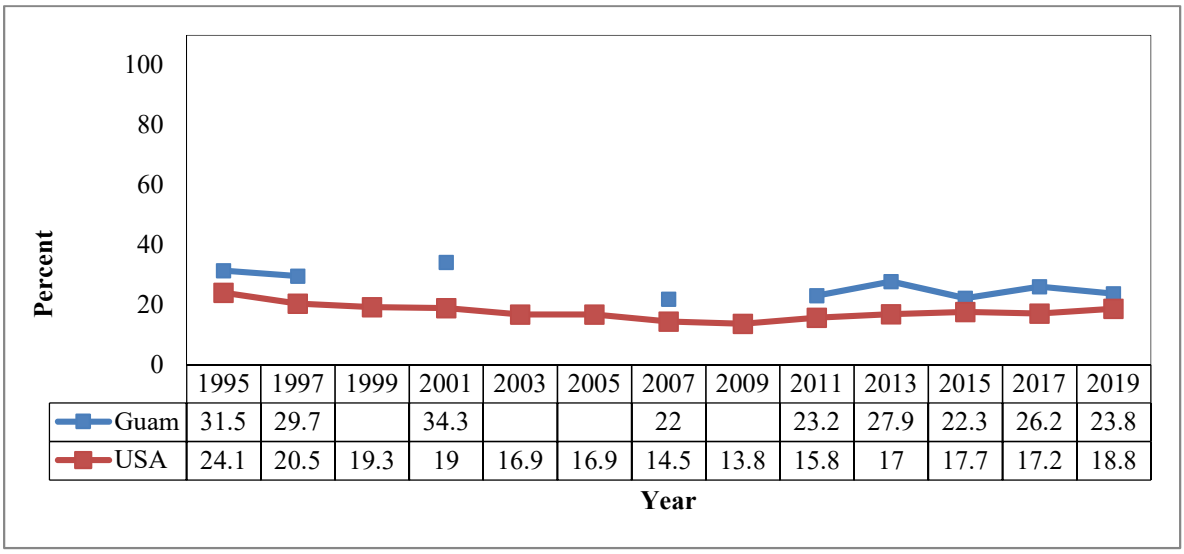
Figure 42. High school students reporting suicide indicators, by sex, 2019



	Seriously considered attempting suicide	Made a suicide plan	Attempted suicide	Suicide attempt requiring medical attention
Total	23.8	24.4	16.5	3.9
Male	17	21.5	12.9	5.9
Female	31.8	28	20.2	1.6

Source: GDOE Youth Risk Behavior Survey 2019

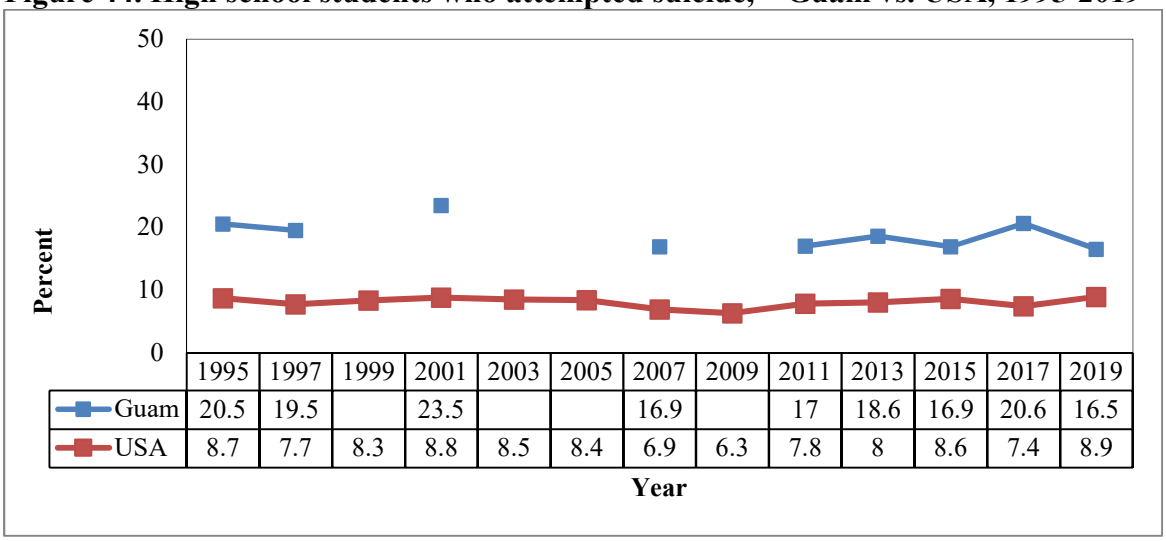
Figure 43. High school students who seriously considered attempting suicide, * Guam vs. USA, 1995-2019†



	1995	1997	1999	2001	2003	2005	2007	2009	2011	2013	2015	2017	2019
Guam	31.5	29.7		34.3			22		23.2	27.9	22.3	26.2	23.8
USA	24.1	20.5	19.3	19	16.9	16.9	14.5	13.8	15.8	17	17.7	17.2	18.8

*Ever during the 12 months before the survey
†Decreased 1995-2019 [Based on linear and quadratic trend analyses using logistic regression models controlling for sex, race/ethnicity, and grade ($p < 0.05$). Significant linear trends (if present) across all available years are described first followed by linear changes in each segment of significant quadratic trends (if present).]
Data not available for 1999, 2003, 2005, 2009 for Guam. This graph contains weighted results.
Source: CDC Youth Risk Behavior Surveys 1995-2019

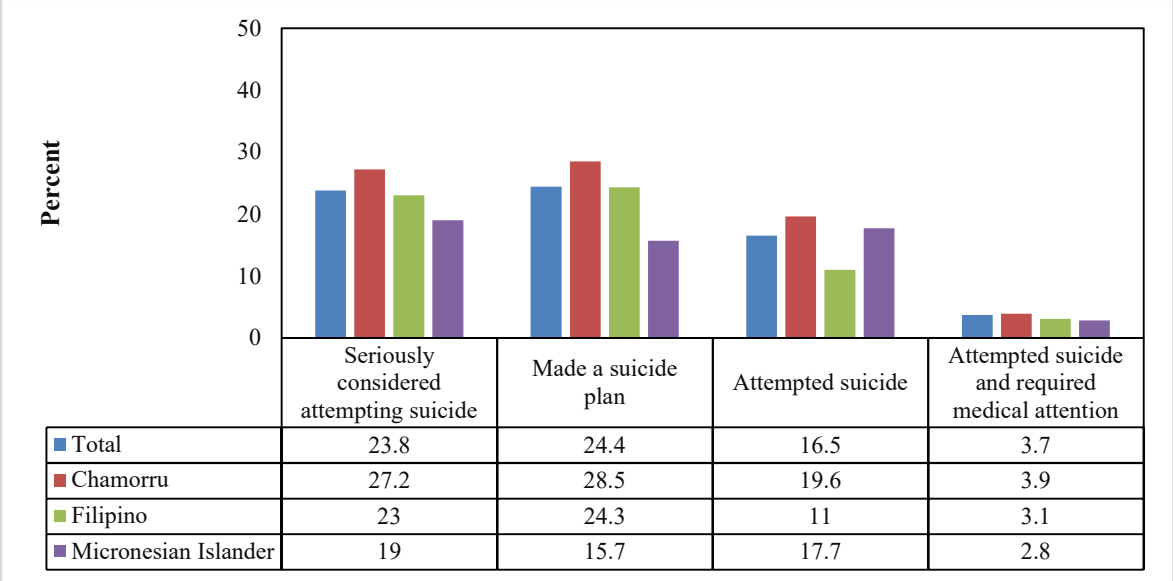
Figure 44. High school students who attempted suicide, * Guam vs. USA, 1995-2019†



	1995	1997	1999	2001	2003	2005	2007	2009	2011	2013	2015	2017	2019
Guam	20.5	19.5		23.5			16.9		17	18.6	16.9	20.6	16.5
USA	8.7	7.7	8.3	8.8	8.5	8.4	6.9	6.3	7.8	8	8.6	7.4	8.9

*Ever during the 12 months before the survey
†Decreased 1995-2019 [Based on linear and quadratic trend analyses using logistic regression models controlling for sex, race/ethnicity, and grade ($p < 0.05$). Significant linear trends (if present) across all available years are described first followed by linear changes in each segment of significant quadratic trends (if present).]
Data not available for 1999, 2003, 2005, 2009 for Guam. This graph contains weighted results.
Source: CDC Youth Risk Behavior Surveys 1995-2019

Figure 45. Suicide indicators and ethnicity, High school students, Guam, 2020



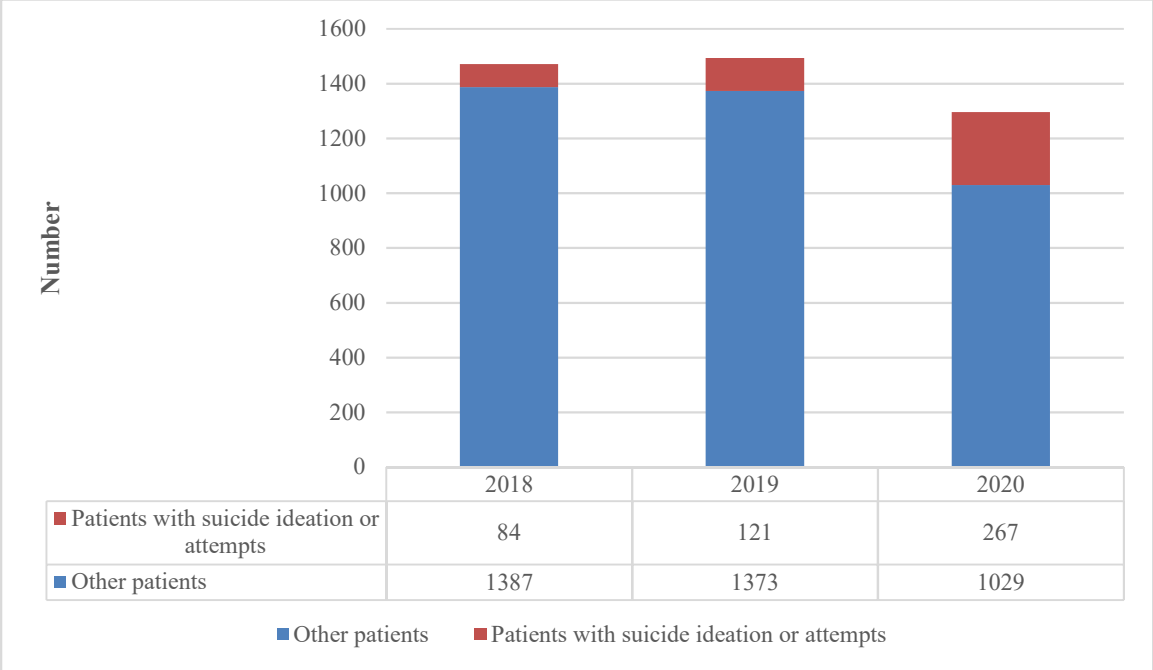
	Seriously considered attempting suicide	Made a suicide plan	Attempted suicide	Attempted suicide and required medical attention
Total	23.8	24.4	16.5	3.7
Chamorru	27.2	28.5	19.6	3.9
Filipino	23	24.3	11	3.1
Micronesian Islander	19	15.7	17.7	2.8

Source: YRBS 2019

Currently there is no readily accessible systematic surveillance mechanism to track suicidal attempts and suicidal ideation among adults in Guam. However, data exists from the Guam Behavioral Health and Wellness Center's (GBHWC) admissions data. In 2020, a total of 267 consumers at the GBHWC had suicide attempts or suicide ideation attached to their diagnoses, out of a total of 1,296 admissions (21% of all encounters). This represents an increase over the previous 2 years (Figure 45), both in absolute number and proportion of consumers.

Overall, the number of consumers in 2020 decreased from previous years; however, the number presenting with suicide ideation/attempts increased. The percentage of GBHWC patients with suicide ideation/attempts in their diagnosis list increased from 6% in 2018, to 9% in 2019, and 21% in 2020. This is consistent with the anticipated rise in mental health disturbances accompanying the COVID-19 pandemic and its socio-economic consequences.

Figure 46. Number and percent of GBHWC admissions with suicide ideation or suicide attempts, 2018-2020



Source: GBHWC admission data, 2018-2020

Disease profile (Morbidity)

Sexually transmitted infections (STIs)

Both HIV and syphilis incidence rates are lower in Guam than in the U.S. However, the chlamydia incidence rate is notably higher among people in Guam (Table 48). HIV incidence has decreased since 2012. Chlamydia and gonorrhea have increased over time (Table 49).

Table 48. STI indicators, Guam vs. USA, 2019

Domain	Indicator	Source: DPHSS data	Guam	USA*	HP 2020 target
STI	HIV diagnosis rate**	CDC data	7.8/100,000	12.6/100,000	-
	Chlamydia incidence rate	Calculated from data reported in the 2019 Guam Statistical Yearbook, using projected 2019 population of 166,658	738/100,000	551/100,000	-
	Gonorrhea incidence rate		188.4/100,000	187.8/100,000	-
	Syphilis incidence		15/100.000	39.7/100,000	-

Note: "-" = no HP 2020 target established; * - US data taken from 2019 US CDC statistics available at https://www.cdc.gov/std/statistics/2019/tables/1.htm; HIV incidence from HIV.gov at https://www.hiv.gov/hiv-basics/overview/data-and-trends/statistics; **-Guam HIV diagnosis data from https://gis.cdc.gov/grasp/nchhstpatlas/tables.html

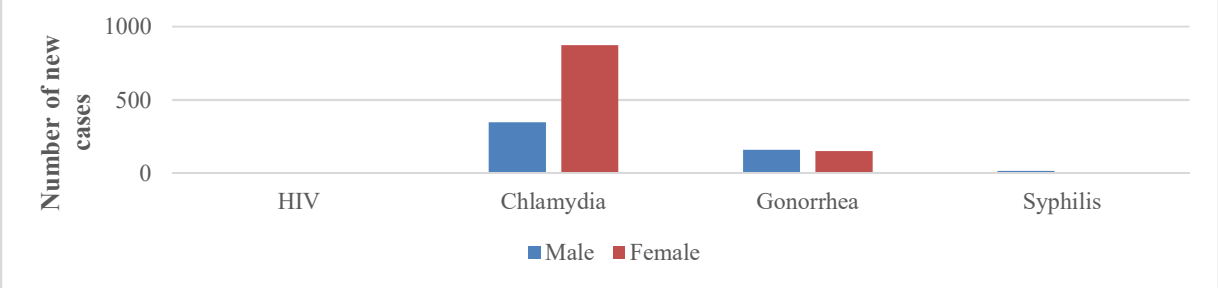
Table 49. STI indicators, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
STI	HIV diagnosis rate*	2012 DPHSS data	5.7/100,000	7.8/100,000	Calculated from data reported in the 2019 Guam Statistical Yearbook, using projected 2019 population of 166,658
	Chlamydia incidence rate		644.7/100,000	738/100,000	
	Gonorrhea incidence rate		57.5/100,000	188.4/100,000	
	Syphilis incidence rate		17.5/100,000	15/100.000	

Note: * Guam HIV diagnosis data from https://gis.cdc.gov/grasp/nchhstpatlas/tables.html

All new HIV cases in 2019 were in men. Women outnumbered men for newly diagnosed chlamydia infections (Figure 46).

Figure 47. Sexually transmitted infections, by sex, Guam, 2019



Source: Annual summary of notifiable diseases as reported in the 2019 Guam Statistical Yearbook

Vaccine preventable diseases

Guam had higher incidence rates for Hepatitis A and B, varicella, pertussis, and mumps (Table 50), which may reflect, in part, lower vaccine coverage for these diseases. However, the elevated hepatitis A and B rates may also be partly accounted for by in-migration from the other Pacific islands and Asian countries, where these diseases are highly endemic, with subsequent diagnosis made in Guam. In addition, the hepatitis B vaccine was introduced into Guam in 1988-1989 for targeted groups (infants, contacts of known cases); thus, individuals born prior to vaccine introduction would not have been immunized. Thus, hepatitis A and B rates are determined by a variety of factors and may not be ideal indicators for vaccine coverage.

Table 50. Vaccine-preventable diseases, Guam vs. USA, 2019

Domain	Indicator	Source: 2019 DPHSS data	Guam	USA	HP 2020 Target
Vaccine preventable diseases	Hepatitis A incidence	Calculated from data reported in the 2019 Guam Statistical Yearbook, using projected 2019 population of 166,658	135.6/100,000	5.7/100,000	0.3/100,000
	Hepatitis B incidence		13.2/100,000	1.1/100,000	1.5/100,000
	Varicella incidence		10.8/100,000	3.1/100,000	1/100,000
	Influenza incidence		202.2/100,000	NA	-
	Measles incidence		0	0.39/100,000	.0003/100,000
	Pertussis incidence		7.2/100,000	5.67/100,000	-
	Mumps incidence		135.6/100,000	1.15/100,000	.005/100,000

Note: "-" = no overall HP 2020 target established for influenza; instead, HP 2020 sets influenza immunization coverage targets for specific age groups and risk levels ; "NA" = not available; * = US data taken from CDC statistics available at https://wonder.cdc.gov/nndss/static/2019/annual/2019-table1.html

Table 51. Vaccine-preventable diseases, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Vaccine preventable diseases	Hepatitis A incidence	2012 Data	13.8/100,000	135.6/100,000	Calculated from data reported in the 2019 Guam Statistical Yearbook, using projected 2019 population of 166,658
	Hepatitis B incidence	2012 Data	41.3/100,000	13.2/100,000	
	Varicella incidence	2012 Data	31.3/100,000	10.8/100,000	
	Influenza incidence	2012 Data	85.1/100,000	202.2/100,000	
	Measles incidence	2012 Data	0	0	
	Pertussis incidence	2012 Data	0.6/100,000	7.2/100,000	
	Mumps incidence	2012 Data	1.9/100,000	0.6/100,000	

Hepatitis B, varicella, and mumps incidence have decreased over time, and measles remains undetected in Guam. These may indicate improved vaccination coverage for these diseases.

Other infectious diseases: Tuberculosis

Tuberculosis (TB) incidence in Guam remains far above the US incidence rate (Table 52), and above the HP 2020 target.

Table 52. Tuberculosis incidence rate, Guam vs. USA, 2020

Domain	Indicator	Source	Guam	USA*	HP 2020 target
Infectious diseases	TB incidence rate	2020 DPHSS Data	33.9/100,000	2.2/100,000	1/100,000

Note: * = US data taken from 2020 CDC statistics as reported in https://www.naccho.org/blog/articles/cdc-mmwr-released-reported-tuberculosis-in-the-united-states-2020
Guam rate from DPHSS program data

Table 53. Tuberculosis incidence rate, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Infectious diseases	TB incidence rate	2012 DPHSS Data	42.5/100,000	33.9/100,000	2020 DPHSS data

TB incidence dropped in 2020 (Figure 53), compared to baseline, but remains significantly higher than the US rate. The persistently high rate likely reflects the impact of migration into Guam from countries and areas with high endemicity for TB.

Vector-borne diseases: Dengue

Dengue incidence remains higher than the US (Table 54), and now represents both endemic and imported cases. Local transmission of dengue in Guam was first reported in 2019, after 75 years of no cases acquired locally.

Table 54. Dengue incidence rate, Guam vs. USA, 2019

Domain	Indicator	Source	Guam	USA*	HP 2020 target
Vector-borne diseases	Dengue incidence rate	2019 DPHSS Data	12.6/100,000**	0.43/100,000	-

Note: * = US data taken from 2019 CDC statistics available at https://wonder.cdc.gov/nndss/static/2019/annual/2019-table1.html; ** Calculated from data reported in the 2019 Guam Statistical Yearbook, using projected 2019 population of 166,658; "-" = no overall HP 2020 target established

Table 55. Dengue incidence rate, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Vector-borne diseases	Dengue incidence rate	2012 DPHSS Data	3.1/100,000**	12.6/100,000	2019 DPHSS data

Note: * Calculated from data reported in the 2019 Guam Statistical Yearbook, using projected 2019 population of 166,658

Non-communicable diseases

Table 56. Non-communicable disease indicators, Guam vs. USA, 2020

Domain	Indicator	Source	Guam	USA	HP 2020 target
Non-communicable disease	% Adults diagnosed with heart attack	2020 BRFSS	4.8%	4.3%	-
	% Adults diagnosed with CVD	2020BRFSS	2.8%	4.0%	-
	% Adults diagnosed with stroke	2020 BRFSS	3.2%	2.8%	-
	% Adults diagnosed with diabetes	2020 BRFSS	14.7%	10.8%	-
	% Pregnant women with gestational diabetes	2020 BRFSS	2.7%	0.9%	-
	Lung cancer incidence (Per 100,000)	Cancer in the Pacific 2007-2018 data*	52.6/100,000	53.1/100,000	-
	Breast cancer incidence (Per 100,000)		82.1/100,000 females	69.1/100,000 females	-
	Colon cancer incidence (Per 100,000)		32.7/100,000	37.8/100,000	-
	Cervical cancer incidence (Per 100,000)		10.4/100,000 females	7.5/100,000 females	-
	Prostatic cancer		84.6/100,000 males	111.3/100,000 males	-

Note: US cancer data taken from Surveillance, Epidemiology and End Results (SEER) 18 and US Cancer Statistics Data for 2014-2018; * - time period different from the US data; Guam incidence rates standardized to US standard population; "-" = no HP 2020 target established

Table 57. Non-communicable disease indicators, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Non-communicable disease	% Adults diagnosed with heart attack	2011 BRFSS	3.10%	4.8%	2020 BRFSS
	% Adults diagnosed with CVD	2011 BRFSS	2.80%	2.8%	2020 BRFSS
	% Adults diagnosed with stroke	2011 BRFSS	3.20%	3.2%	2020 BRFSS
	% Adults diagnosed with diabetes	2011 BRFSS	9.90%	14.7%	2020 BRFSS
	% Pregnant women with gestational diabetes	2010 BRFSS	0.70%	2.7%	2020 BRFSS
	Lung cancer incidence (Per 100,000)	2003-2007 Cancer Registry data	85.4/100,000 males	76.22/100,000 males	2008-2012 Cancer Registry data
			40.6/100,000 Females	31.12/100,000 females	
	Breast cancer incidence (Per 100,000)	2003-2007 Cancer Registry data	81.5/100,000 Females	95.5/100,000 females	

	Colon cancer incidence (Per 100,000)	2003-2007 Cancer Registry data	34.4/100,000 Males	31.91/100,000 males	
			23.9/100,000 Females	16.88/100,000 females	
	Cervical cancer incidence (Per 100,000)	2003-2007 Cancer Registry data	13.4 Females	35.8/100,000 females	
	Prostatic cancer incidence	2003-2007 Cancer Registry data	65.6/100,000 males	82.1/100,000 males	

Note: Guam current cancer data taken from 2008-2012 Guam Cancer Registry to match the 5-year period for the baseline; incidence rates are slightly different from the 2007-2018 Cancer in the Pacific data

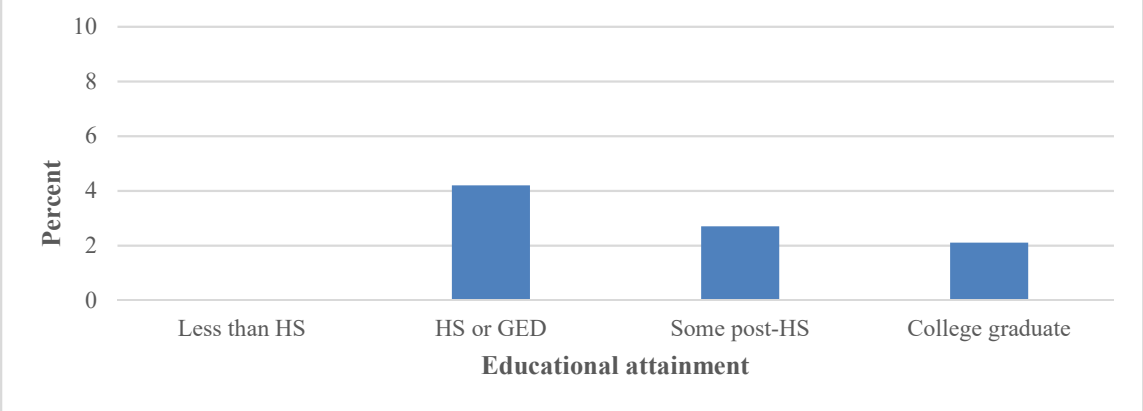
The profile for non-communicable diseases (NCDs) in Guam is a mixed one (Table 56). Guam residents are less likely to report having a diagnosis of cardiovascular disease (CVD) than their US counterparts, and as likely to be diagnosed with a heart attack. Guam adults are more likely to be diagnosed with stroke, diabetes, and (for pregnant women) gestational diabetes. Prostatic and colon cancer incidence are lower than in the US. However, the incidence of breast and cervical cancer are higher in Guam.

Heart attack, diabetes, gestational diabetes, breast and cervical cancer in women and prostate cancer in men have risen in incidence over time. Lung and colon cancer incidence have decreased (Table 57).

Heart attack

Guam residents are as likely as their US counterparts to report a heart attack diagnosis. Educational attainment is inversely proportional to the likelihood of being diagnosed with a heart attack (Figure 47).

Figure 48. Heart attack, by educational attainment, Guam, 2020



Source: 2020 BRFSS

Cardiovascular disease (CVD)

The percentage of Guam residents reporting a diagnosis of CVD in 2020 is lower than the US median. Males are less likely than females to report a CVD diagnosis (2.2% vs. 3.5%).

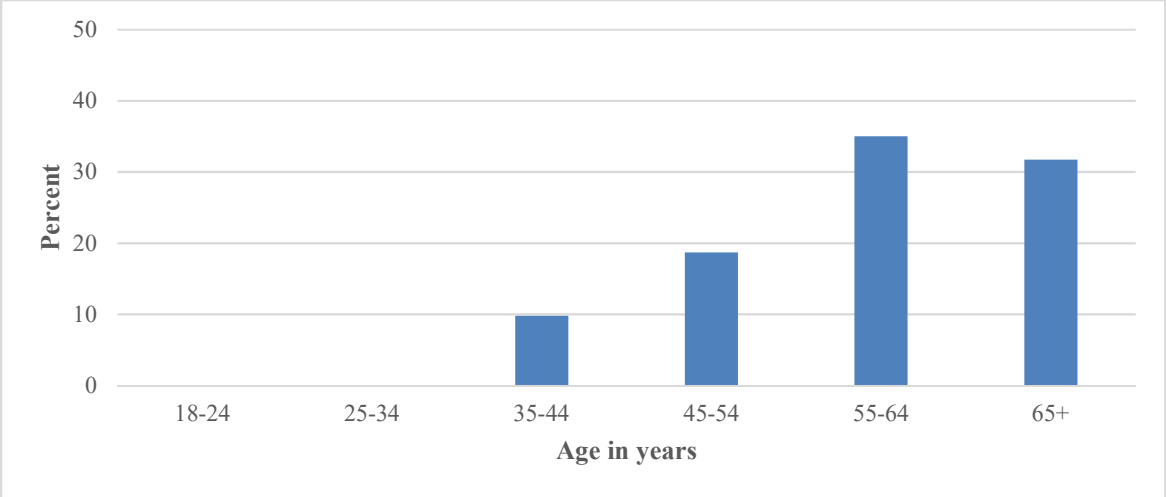
Stroke

The percentage of Guam residents reporting a diagnosis of stroke is comparable to the US. Males are equally likely as females to report a stroke diagnosis.

Diabetes

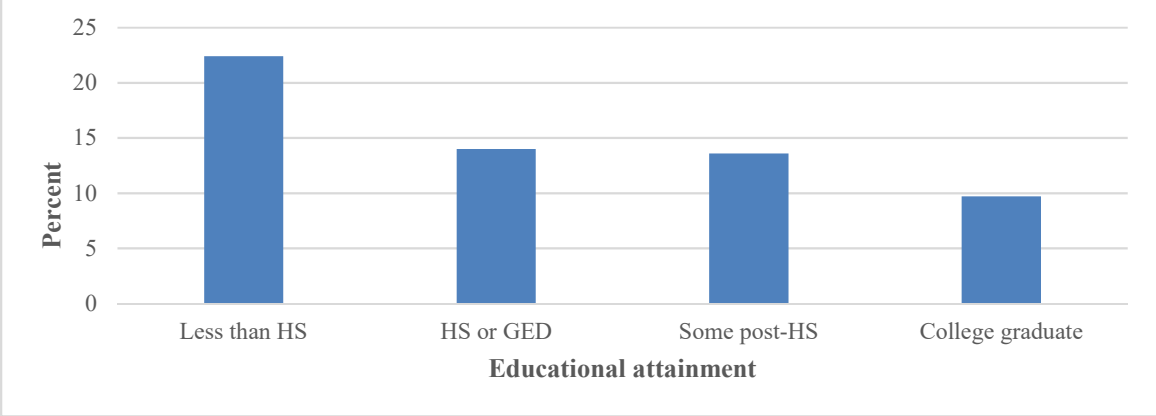
The percentage of adults in Guam diagnosed with diabetes, and pregnant women with gestational diabetes, are higher than the US median. No apparent difference is noted between the sexes. Increasing age (Figure 49), lower education (Figure 50), and higher income (Figure 51) are associated with a higher likelihood of the diagnosis of diabetes.

Figure 49. Diabetes diagnosis, by age, Guam, 2020



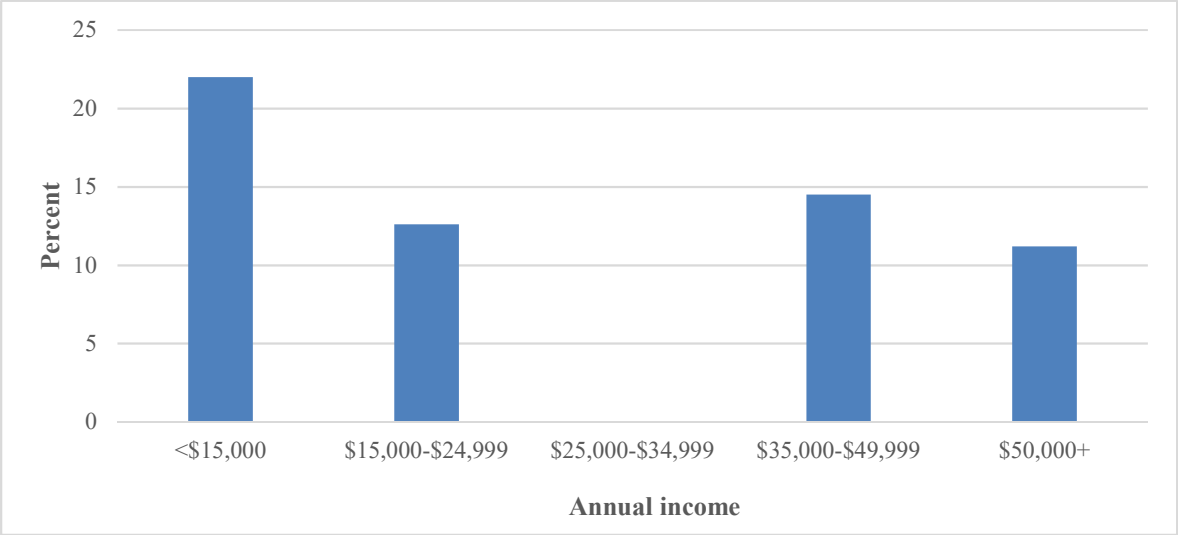
Source: BRFSS, 2020

Figure 50. Diabetes diagnosis, by educational level, Guam, 2020



Source: BRFSS, 2020

Figure 51. Diabetes diagnosis, by income level, Guam, 2020



Source: BRFSS, 2020

Lung cancer

Lung cancer incidence is higher among males. Micronesian islanders and CHamorus have the highest incidence of lung cancer (Table 58); these groups also have the highest tobacco consumption. Notably, lung cancer incidence has begun to decrease over time for all groups, following the successive drop in smoking prevalence across the entire population.

Table 58. Lung cancer incidence, by ethnicity, Guam, 2003-2007, 2008-2012, 2013-2017

	2003-2007	2008-2012	2013-2017
Ethnicity	**Incidence per 100,000**	**Incidence per 100,000**	**Incidence per 100,000**
Chamorro	88.4	70.6	69.4
Filipino	34.0	38.0	29.6
White/Caucasian	85.3	59.2	63.1
Asian	77.3	35.5	38.2
Micronesian	174.7	128.7	78.6

Source: Guam Cancer Registry
Note: 2013-2017 data are preliminary

Cervical cancer

Cervical cancer incidence among Guam women is almost double the rate of US women. Cervical cancer is highest among Micronesian women (Table 59). This is likely linked to the lower utilization of Pap smears by women in Guam.

Table 59. Cervical cancer incidence, Guam, 2003-2007, 2008-2012, 2013-2017

Ethnicity	2003-2007 Incidence per 100,000	2008-2012 Incidence per 100,000	2013-2017 Incidence per 100,000
Chamorro	11.6	24.8	11.9
Filipino	5.5	5.2	5.8
White/Caucasian	10.5	24.4	-
Asian	14.5	17.4	-
Micronesian	21.1	43.2	31.2

Source: Guam Cancer Registry
Note: 2013-2017 data are preliminary

Disability

Mobility, cognitive, hearing, self-care and independent disability indicators for Guam are similar to the US figures (Table 60). Visual impairment and the percentage of the adult population with any form of disability are slightly higher than the US median.

Table 60. Disability indicators, Guam vs. USA, 2019

Domain	Indicator	Source	Guam	USA	HP 2020 target
Disability	% Adults with mobility problems	2019 BRFSS*	15.3%	13.7%	-
	% Adults with cognitive deficits	2019 BRFSS*	11.7%	10.8%	-
	% Adults with difficulty doing errands alone	2019 BRFSS*	8.4%	6.8%	-
	% Adults with deafness of serious difficulty hearing	2019 BRFSS*	8.9%	5.9%	
	% Adults with blindness or serious difficulty seeing	2019 BRFSS*	9.0%	4.6%	
	% Adults with difficulty dressing or bathing	2019 BRFSS*	2.7%	3.7%	
	% Adults with some form of disability	2019 BRFSS*	30.6%	26%	

Source: US and Guam data taken from the BRFSS 2019 as presented at https://www.cdc.gov/ncbddd/disabilityandhealth/infographic-disability-impacts-all.html
Note: "-" = no HP 2020 target established

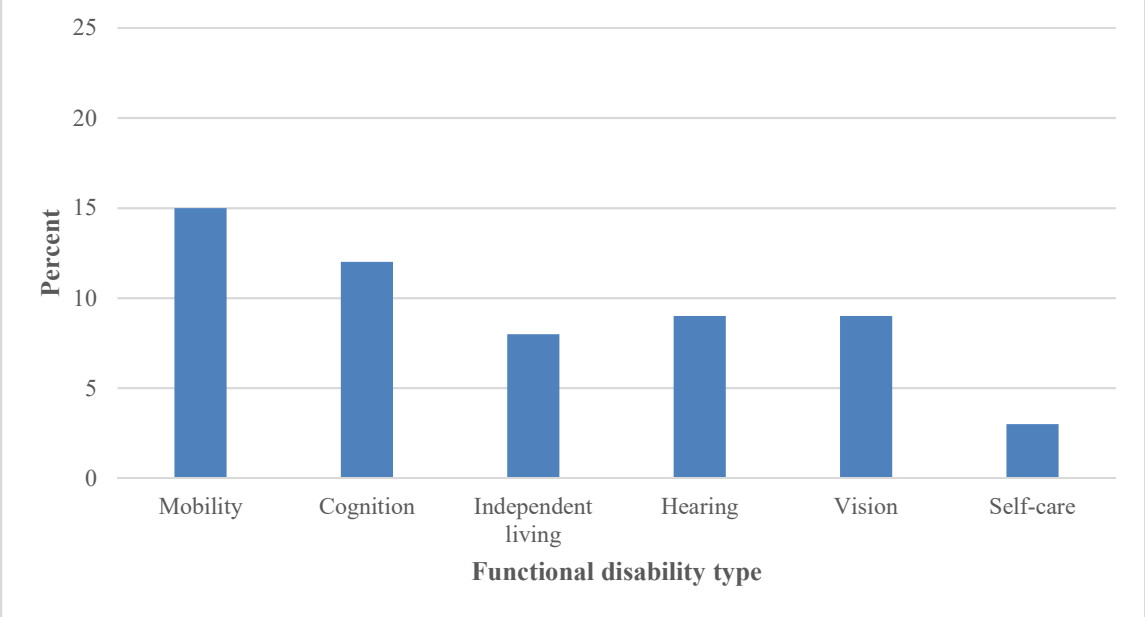
Table 61. Disability indicators, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Disability	% Adults with mobility problems	2016 BRFSS*	12.6%	15.3%	2019 BRFSS
	% Adults with cognitive deficits	2016 BRFSS*	8.8%	11.7%	2019 BRFSS
	% Adults with difficulty doing errands alone	2016 BRFSS*	6.6%	8.4%	2019 BRFSS
	% Adults with deafness of serious difficulty hearing	2016 BRFSS*	5.1%	8.9%	2019 BRFSS
	% Adults with blindness or serious difficulty seeing	2016 BRFSS*	7.9%	9.0%	2019 BRFSS
	% Adults with difficulty dressing or bathing	2016 BRFSS*	3.7%	2.7%	2019 BRFSS
	% Adults with some form of disability	2016 BRFSS*	24.1%	30.6%	2019 BRFSS

Note: * = Data collection for these disability indicators started in 2016

Disabilities that affect mobility and cognition are the more prevalent forms of disability (Figure 52). The percentage of adults reporting one or more forms of disability appears to be increasing over time. Disability increases with increasing age. No disparities are noted with sex and veteran status.

Figure 52. Percentage of adults with select functional disability, Guam, 2019



Source: 2019 BRFSS

Mortality

Overall (all-cause) mortality in Guam is lower than the US. However, Guam's infant mortality rate remains higher than that of the US. The cardiovascular mortality rate in Guam is higher than the rate in the US mainland. Cancer, Chronic Obstructive Pulmonary Disease (COPD), and accidental injury mortality are lower in Guam. Diabetes dropped out of the ten top causes of mortality in Guam starting in 2016. Guam has not met the HP 2020 targets for infant mortality and cardiovascular and cancer mortality. Guam meets the HP 2020 target for accidental injury mortality (Table 62).

Table 62. Mortality indicators, Guam vs. USA, 2019

Domain	Indicator	Source:	Guam	USA*	HP 2020 target
Overall mortality	All-cause death rate	2019 DPHSS Vital Statistics	621/100,000 (2019)	715.2/100,000 (2019)	-
Age-specific mortality	Infant mortality rate	2017 DPHSS Vital Statistics	8.2 per 1,000 live births (2017)	5.79/1000 (2017)	6.0/1000
Cause specific mortality	Cardiovascular mortality rate	2017 DPHSS Vital Statistics	206.9/100,000 (2017)	198.8/100,000 (2017)	100.8/100,000
	Cancer mortality rate	2017 DPHSS Vital Statistics	103.7/100,000 (2017)	183.9/100,000 (2017)	160.6/100,000
	Diabetes mortality rate	2017 DPHSS Vital Statistics	N/A	25.7/100,000 (2017)	65.8/100,000
	COPD mortality rate	2017 DPHSS Vital Statistics	15.9/100,000 (2017)	49.2/100,000 (2017)	-
	Accidental injury mortality rate	2017 DPHSS Vital Statistics	18.3/100,000 (2017)	52.2/100,000 (2017)	36/100,000
	Suicide death rate	2020 CME data as analyzed by the Guam SEOW	23.7/100,000	12/100,000*	10.2/100,000

Note: * = US mortality rates are age-adjusted and taken from 2019 and 2017 National Vital Statistics System (NVSS) data; "-" = no HP 2020 target established

Table 63. Mortality indicators, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Overall mortality	All-cause death rate	2011 DPHSS Vital Statistics	570.7/100,000	621/100,000 (2019)	2019 DPHSS Vital Statistics
Age-specific mortality	Infant mortality rate		12.7 per 1,000 live births	8.2 per 1000 live births (2017)	2017 DPHSS Vital Statistics as reported in the 2019 Guam Statistical Yearbook
Cause specific mortality	Cardiovascular mortality rate		223.1/100,000	206.9/100,000 (2017)	
	Cancer mortality rate		111.1/100,000	103.7/100,000 (2017)	
	Diabetes mortality rate		39.9/100,000	N/A	
	COPD mortality rate		15.7/100,000	15.9/100,000 (2017)	
	Accidental injury mortality rate		23.4/100,000	18.3/100,000 (2017)	
	Suicide mortality	2012 CME data as analyzed by SEOW	15.6/100,000	23.7/100,000	2020 CME data as analyzed by the Guam SEOW

Other health indicators: Oral health

Table 64. Oral health indicators, Guam vs. USA, 2019

Domain	Indicator	Source: DPHSS data	Guam	USA	HP 2020 target
Dentition Dental care Gum disease	Adults that have had any permanent teeth extracted	2020 BRFSS	58.8%	43.70%	-
	Adults that have visited the dentist or dental clinic within the past year for any reason	2020 BRFSS	58.8%	69.60%	-
	Gum disease rates	no data			

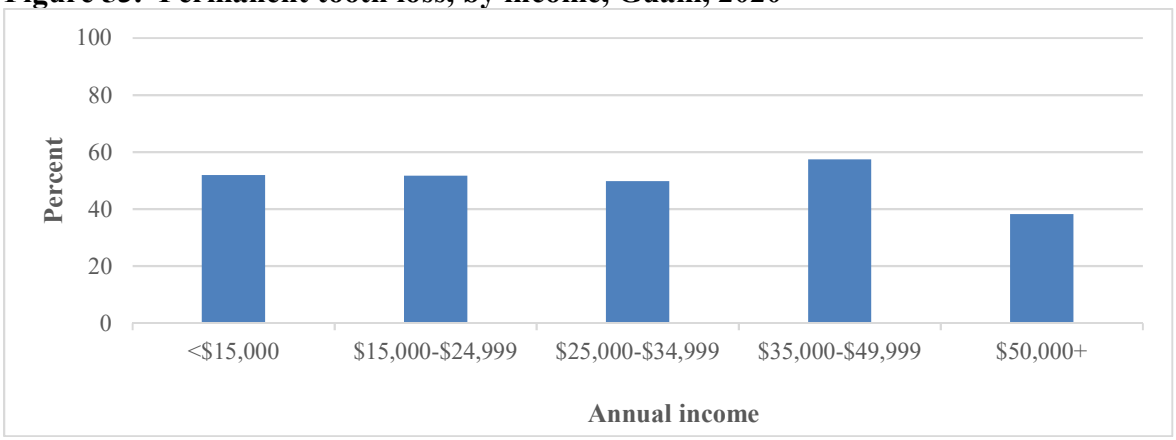
Note: "-" = no HP 2020 target established

Table 65. Oral health indicators, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Dentition Dental care Gum disease	Adults that have had any permanent teeth extracted	2010 BRFSS	56.60%	43.70%	-
	Adults that have visited the dentist or dental clinic within the past year for any reason	2010 BRFSS	61.20%	69.60%	-
	Gum disease rates	no data			

Guam residents are more likely to have lost their permanent teeth and less likely than their US counterparts to have visited the dentist within the past year (Table 64). Permanent tooth loss is higher among those with lower incomes (Figure 53). Dental visits are more likely among those with higher incomes (Figure 54).

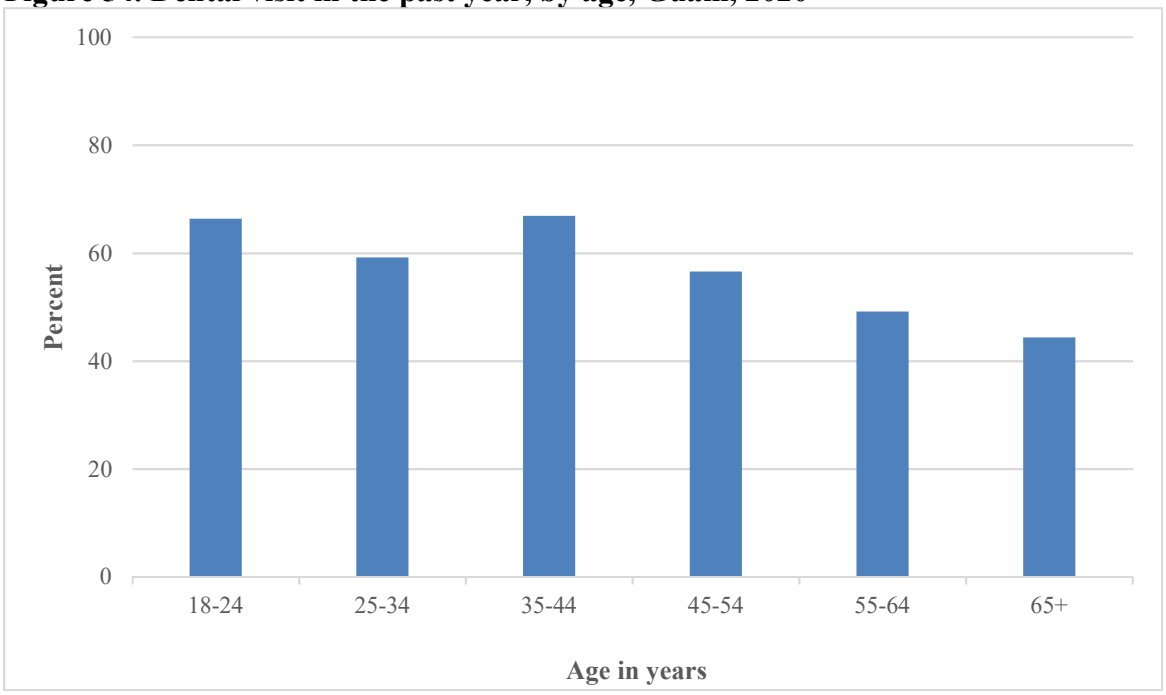
Figure 53. Permanent tooth loss, by income, Guam, 2020



Source: BRFSS, 2020

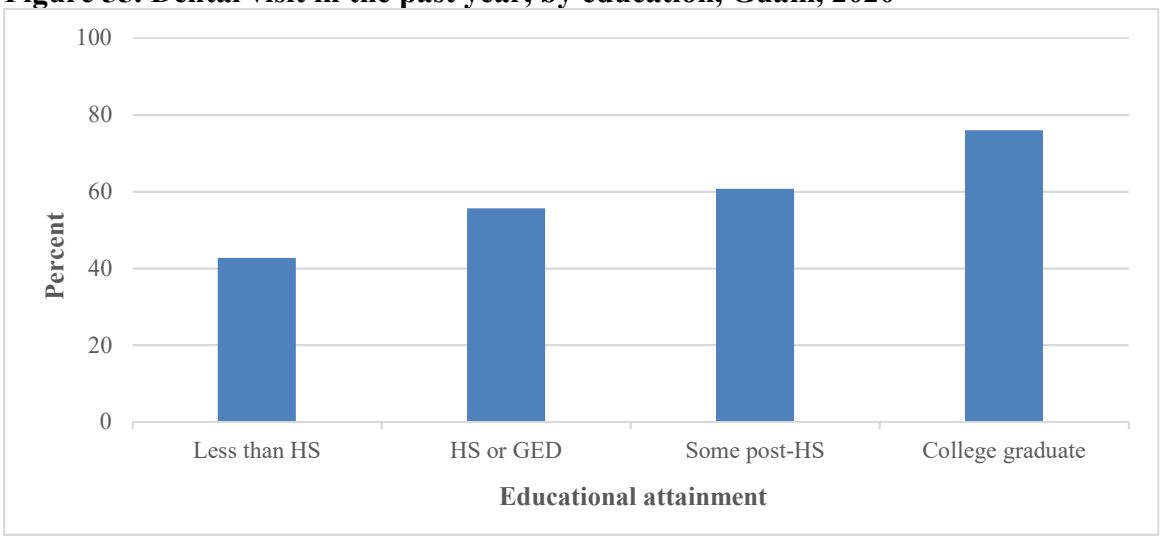
Women are more likely than men to have visited the dentist in the past year (64.6% vs. 53.3%). Dental visits decrease with age (Figure 54) but increase with education and income. (Figures 53-56).

Figure 54. Dental visit in the past year, by age, Guam, 2020



Source: 2020 BRFSS

Figure 55. Dental visit in the past year, by education, Guam, 2020



Source: 2020 BRFSS

Figure 56. Dental visit in the past year, by income, Guam, 2020

Source: BRFSS, 2020

Health system

Guam lags behind the US for most of the indicators addressing the health care system (Table 66). There are more physicians but less hospital beds per capita, lower per capita health expenditure, and a greater percentage of uninsured individuals in Guam. The physician to population ratio, hospital bed to population ratio and insurance coverage have improved over time (Table 67). These data highlight the need for significant health system strengthening, and a continued push to achieve universal health coverage.

Table 66. Health system indicators, Guam vs. USA, 2018-2020

Domain	Indicator	Source	Guam	USA	HP 2020 target
Health workforce	Physician to population ratio	Calculated from data in 2019 Guam Statistical Yearbook	3.09/1,000	2.95/1,000** **(2016)**	-
Health infrastructure	Hospital bed to population ratio	Calculated from bed data from GMH, GRMC and Naval Hospital	2.03/1,000 (2020)	2.5/1,000** *(2017)	-
	% Adults who have a primary care provider	2020 BRFSS	56%	71%	-
Health financing	Per capita health expenditure	2000 data, WHO CHIPS 2010	$2,480*** *(2016)	$10,966 (2019)	-
	% Population insured	2020 BRFSS	79.3%	89.3%	100%
	% Under 65 years insured	2010 Census	77.4%	86.8%	-

Sources: *Guam physician data from GBME; **FSMB data available at https://www.fsmb.org/siteassets/advocacy/publications/2016census.pdf; ***hospital bed to population ratio and health care expenditure per capita from https://www.healthsystemtracker.org/chart-collection/u-s-health-care-resources-compare-countries/#item-start; ****Guam per capita health expenditure estimated in Global Burden of Disease Health Financing Collaborator Group at https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)30841-4/fulltext#articleInformation
Note: "-" = no HP 2020 target established

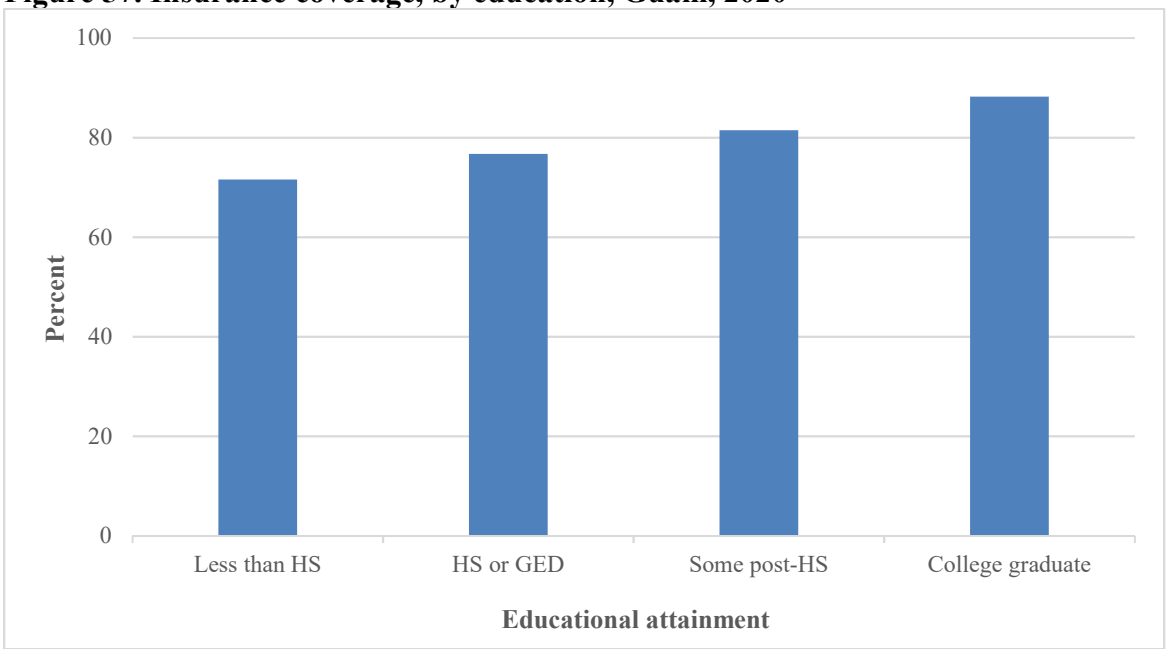
Table 67. Health system indicators, Guam, current vs. baseline

Domain	Indicator	Source Baseline	Baseline	Current	Source Current
Health workforce	Physician to population ratio	BSP 2011	0.98/1,000	3.08/1,000*	Calculated from data in 2019 Guam Statistical Yearbook
Health infrastructure	Hospital bed to population ratio	BSP 2011	0.92/1,000	2.03/1,000	
	% Adults who have a primary care provider	2013 BRFSS	53%	56%	2020 BRFSS
Health financing	Per capita health expenditure	2,000 data, WHO CHIPS 2010	$1,032.36	$2,480.00 (2016)	-
	% Population with insurance	2011 BRFSS	72.0%	79.3%	2020 BRFSS
	% Under 65 years insured	2011 BRFSS	69.8%	77.4%	2020 BRFSS

Note: * Data on licensed physicians in 2021 provided by GBME; midyear 2021 population from 2019 Guam Statistical Yearbook

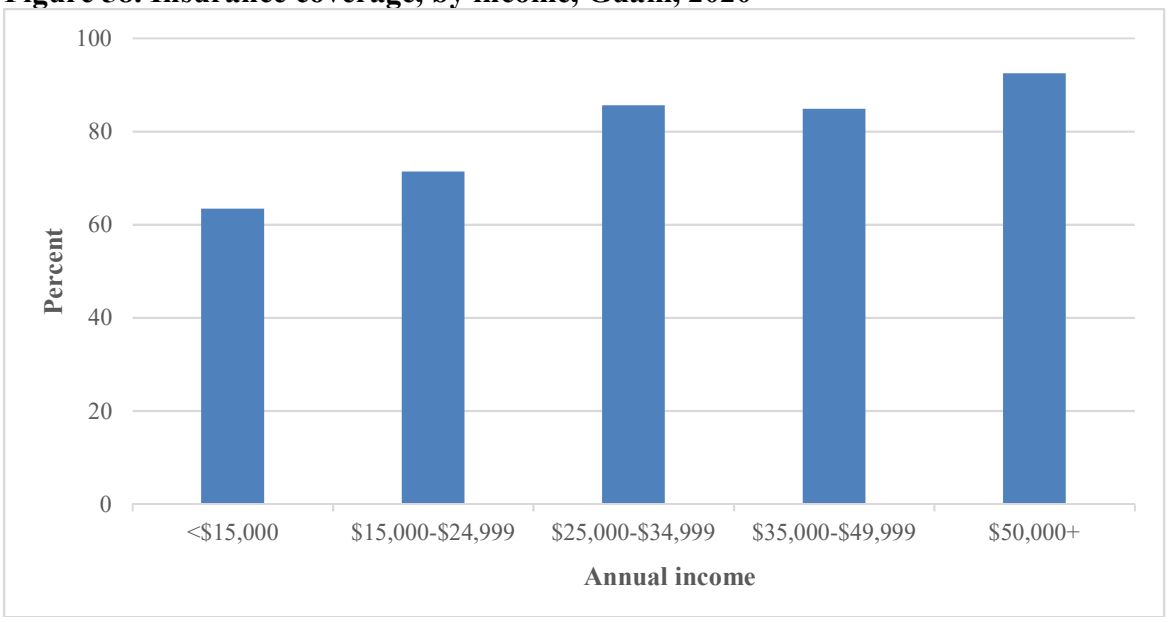
Three-quarters of Guam's population have some form of health insurance. Coverage rises to 94% after the age of 65 years, when Medicare becomes available. Education and income are directly proportional to insurance coverage (Figures 57-58).

Figure 57. Insurance coverage, by education, Guam, 2020



Source: BRFSS, 2020

Figure 58. Insurance coverage, by income, Guam, 2020



Source: BRFSS, 2020

Community Health Priorities

In 2013, community stakeholders identified the following priority health issues for Guam:

- High prevalence of unsafe sex and sexually transmitted diseases
- Other risk-taking behavior, particularly marijuana use and riding in a vehicle with a driver who had been drinking alcohol, among youth
- High prevalence of tobacco use, especially among adults
- Low vaccine utilization and high incidence of vaccine-preventable illnesses, such as influenza, pneumococcal pneumonia, measles, mumps and varicella
- High incidence of lung and cervical cancer
- High incidence of tuberculosis
- Inadequate health system infrastructure, with insufficient number of hospital beds per capita and insufficient health workforce per capita
- Low uptake of cancer screening
- High diabetes and cardiovascular mortality
- High rates of suicide, especially among youth

Changes in the health landscape since 2013

Multiple events have influenced the health landscape in Guam since 2013. Some of the key factors exerting a significant impact on the island's health infrastructure and health profile include:

- 2015 – The opening of the 132-bed Guam Regional Medical City (GRMC) augmented the hospital bed to population ratio, and expanded Guam's inpatient capacity, with the addition of several specialty services that were previously either unavailable or only sporadically available in the island. These include the provision of specialty services in pulmonary medicine, neurosurgery, and hyperbaric medicine.
- 2016 - Cases of multi-drug resistant tuberculosis were diagnosed in Guam. Of the initial 6 cases, 3 were locally acquired.[10]
- 2019 – Locally acquired dengue was documented in Guam.[11] An electrical malfunction resulted in the closure of the DPHSS' central office which required staff to relocate to other facilities and programs and services displaced.
- 2020 – The COVID-19 pandemic was first detected in March 2019 and continues to this day.

Progress across the selected 2013 community health priorities

Changes over time in selected indicators for the 2013 community health priorities were discussed in detail in the preceding section and are summarized in the table below (Table 68).

Table 68. Change over time, selected indicators for Guam's 2013 community health priorities

[10] KUAM News. New TB strain could cost $16,000. 2016. Available at https://www.kuam.com/story/32150130/2016/06/05/new-tb-strain-could-cost-16000

[11] Kern-Allely S, Pobutsky A, Hancock WT. Notes from the Field: First Evidence of Locally Acquired Dengue Since 1944 - Guam, 2019. MMWR Morb Mortal Wkly Rep. 2020;69(13):387-388. Published 2020 Apr 3. doi:10.15585/mmwr.mm6913a4

Indicator	Source Baseline	Baseline	Current	Source Current	Status
High prevalence of unsafe sex and sexually transmitted diseases					
% Tested for HIV, adults	2011 BRFSS	36.6%	31.4%	2020 BRFSS	
% Youth taught about HIV/AIDS	2011 YRBS	86.0%	76.1%	2019 YRBS	
% Youth sexually active	2011 YRBS	49.0%	23.9%	2019 YRBS	
% Youth with 4 or more sexual partners	2011 YRBS	12.0%	6.0%	2019 YRBS	
% Youth used condom during sex	2011 YRBS	32.5%	41.6%	2019 YRBS	
% Female youth using oral contraceptives	2011 YRBS	7.5%	10.3%	2019 YRBS	
HIV diagnosis rate*	2012 DPHSS data	5.7/100,000	7.8/100,000	Calculated from data in the 2019 Guam Statistical Yearbook, using projected 2019 population of 166,658	
Chlamydia incidence rate	2012 DPHSS data	644.7/100,000	738/100,000		
Gonorrhea incidence rate	2012 DPHSS data	57.5/100,000	188.4/100,000		
Syphilis incidence rate	2012 DPHSS data	17.5/100,000	15/100.000		
Birth rate	2011 DPHSS Vital Statistics	20.7 per 1000	18.3 per 1000	2019 Guam Statistical Yearbook	
Teen pregnancy rate	DPHSS data, Live births 15-19 yrs.	60.1/1000	8.5/1000	2019 Guam Statistical Yearbook	
Other risk-taking behavior, particularly marijuana use and riding in a vehicle with a driver who had been drinking alcohol, among youth					
30-day marijuana use, youth	2011 YRBS	32.0%	25.9%	2019 YRBS	
% Riding in a vehicle driven by someone who had consumed alcohol, youth	2011 YRBS	34.9%	25.9%	2019 YRBS	
Binge drinking, youth	2011 YRBS	13.6%	8.2%	2019 YRBS	
High prevalence of tobacco use, especially among adults					
Smoking prevalence, adults	2011 BRFSS	30.5%	20.0%	2020 BRFSS	
Smoking prevalence, youth	2011 YRBS	21.9%	11.9%	2019 YRBS	
Smokeless tobacco use, adults	2005 NHIS	6.9%	6.4%	2020 BRFSS	
Smokeless tobacco use, youth	2011 YRBS	14.0%	11.4%	2019 YRBS	
% Quit attempt in past year, adults	2011 BRFSS	70.0%	72.3%	2017 BRFSS	
% Quit attempt in past year, youth	2011 YRBS	68.7%	67.0%	2019 YRBS	
Low vaccine utilization and high incidence of vaccine-preventable illnesses, such as influenza, pneumococcal pneumonia, measles, mumps and varicella					
% Flu shot in past year	2011 BRFSS	39.2%	52.6%	2020 BRFSS	
% Ever had pneumonia vaccine	2011 BRFSS	39.4%	33.4%	2020 BRFSS	
% Ever had a tetanus shot	2013 BRFSS	55.3%	57.5%	2019 BRFSS	
% Ever had shingles vaccination	2014 BRFSS	12.1%	18.1%	2017 BRFSS	

% Children 19-35 mos. immunized against MMR			82.5%	2017 DPHSS data	
% Children 19-35 mos. immunized against DTaP			67.1%	2017 DPHSS data	
Hepatitis A incidence	2012 Data	13.8/100,000	135.6/100,000	Calculated from data in the 2019 Guam Statistical Yearbook, using projected 2019 population of 166,658	
Hepatitis B incidence	2012 Data	41.3/100,000	13.2/100,000		
Varicella incidence	2012 Data	31.3/100,000	10.8/100,000		
Influenza incidence	2012 Data	85.1/100,000	202.2/100,000		
Measles incidence	2012 Data	0	0		
Pertussis incidence	2012 Data	0.6/100,000	7.2/100,000		
Mumps incidence	2012 Data	1.9/100,000	0.6/100,000		
High incidence of lung and cervical cancer					
Lung cancer incidence (Per 100,000)	2003-2007 Cancer Registry data	85.4/100,000 males 40.6/100,000 Females	76.22/100,000 males 31.12/100,000 females	2008-2012 Cancer Registry data	
Cervical cancer incidence (Per 100,000)	2003-2007 Cancer Registry data	13.4 Females	35.8/100,000 females	Cervical cancer incidence (Per 100,000)	
High incidence of tuberculosis					
TB incidence rate	2012 DPHSS Data	41.3/100,000	47.0/100,000	2019 DPHSS data*	
Inadequate health system infrastructure, with insufficient number of hospital beds per capita and insufficient health workforce per capita					
Physician to population ratio	BSP 2011	0.98/1000	3.09/1000	Physician to population ratio	
Hospital bed to population ratio	BSP 2011	0.92/1000	2.03/1000	Hospital bed to population ratio	
% Population with insurance	2011 BRFSS	72.0%	79.3%	2020 BRFSS	
Low uptake of cancer screening					
% Women 40+ who had a mammogram in past 2 years	2010 BRFSS	64.4%	59.4%	2020 BRFSS	
% Women 50+ who had a mammogram in past 2 years	2010 BRFSS	71.4%	72.3%	2020 BRFSS	
% Women 18+ who had a pap smear within past 3 years*	2010 BRFSS	67.8%			
% Women 21-65 who had a pap smear within the past 3 years**			68.0%	2020 BRFSS	
% Adults 50+ who have had a colonoscopy/ sigmoidoscopy*	2010 BRFSS	37.8%			

% Adults 50-75 who have had a colonoscopy within 10 yrs.**			37.5%	2020 BRFSS	
% Men 50+ who had prostate cancer screening*	2011 BRFSS	28.3%			
% Men 40+ who had PSA test within past 2 years**			16.1%	2020 BRFSS	
High diabetes and cardiovascular mortality					
Cardiovascular mortality rate	2011 DPHSS Vital Statistics	223.1/100,000	206.9/100,000 (2017)	2017 DPHSS Vital Statistics as reported in the 2019 Guam Statistical Yearbook	
Diabetes mortality rate		39.9/100,000	N/A***		
% Adults diagnosed with heart attack	2011 BRFSS	3.10%	4.8%	2020 BRFSS	
% Adults diagnosed with CVD	2011 BRFSS	2.80%	2.8%	2020 BRFSS	
% Adults diagnosed with diabetes	2011 BRFSS	9.90%	14.7%	2020 BRFSS	
High rates of suicide, especially among youth					
Suicide death rate	2012 CME data as analyzed by the Guam SEOW	15.6/100,000	23.7/100,000	2020 CME data as analyzed by the Guam SEOW	
% Youth reporting suicidal ideation	2011 YRBS	23.20%	23.8%	2019 YRBS	
% Youth with a suicide attempt	2011 YRBS	17%	16.5%	2019 YRBS	

Note: * - Indicator not asked in 2020; ** - indicator not asked in 2010; *** - Diabetes dropped out of Guam's top 10 causes of mortality in 2016
Data highlighted in **green** indicate improvement over time; data highlighted in **red** indicate worsening trend over time.

The most notable improvements have occurred in risk taking behavior, particularly binge drinking, marijuana use and smoking among youth and smoking among adults. Tobacco use rates have been declining in Guam since 2010, after successive policy measures designed to reduce the demand, accessibility, and affordability of tobacco. Binge drinking has decreased following legislative interventions to raise the legal drinking age and reduce access to alcohol. Likely because of the significant lead time in the decline of smoking, lung cancer incidence is now beginning to decrease. These data document the **significant impact of policy interventions on health.**

The indicators for risky sexual behavior among youth have also improved over time. Less youth are sexually active or report multiple sexual partners, and more youth are using condoms and contraceptives. Consistent with these, teen pregnancy rates have dropped significantly since 2011. Chlamydia and gonorrhea incidence have increased; however, cervical cancer incidence has also risen over time. These may reflect persistent risky sexual behavior among adults. When Guam begins to collect HPV vaccination data regularly, we will be able to track its impact on cervical cancer.

Cardiovascular mortality has decreased although the diagnosis of heart attack or cardiovascular disease has stayed unchanged over the years. Diabetes dropped out of the top ten causes of mortality in 2016, yet diabetes diagnosis has risen over the same time. These may be associated with better insurance coverage of the population and changes in the health infrastructure, with the addition of more physicians, greater in-patient capacity and hospital-based services when the GRMC hospital opened in 2015.

At the front end, Guam NCD prevalence may appear to be increasing because of better screening rates, arising from a higher proportion of the population currently with medical insurance, and therefore, enhanced access to primary care services. Downstream, potentially fatal incidents of heart attack, CVD, stroke and diabetes requiring tertiary level hospital facilities and a specialized health workforce capable of performing complex procedures (such as angioplasties and coronary bypass for heart attacks and CVD, reperfusion technologies for stroke and kidney transplantation for diabetes-related end-stage renal disease) may be better addressed at the present time, given increased hospital bed capacity and in-patient specialty services. Improving hospital and health workforce per capita ratios and health insurance coverage in Guam contribute to better capacities of the health care system to address both preventive/early interventions, like screening and prompt treatment, and tertiary care for potentially fatal NCD incidents.

Changes in cancer screening are difficult to discern because of changes in how the indicators were defined midway during the data collection period. Tuberculosis incidence remains unchanged. Increasing uptake of the flu vaccine have not yet led to reductions in influenza incidence, likely because only half of the population has reported getting the annual vaccine. Suicide is worsening over time.

Updated community health priorities

In 2019, preparations for the next round of stakeholder consultations for the community health assessment were started. Two events significantly affected the planning process. The first was the electrical malfunction that displaced staff, programs, and services at the DPHSS's central office, which jeopardized data retrieval pertaining to key health indicators. The second was the advent of the Coronavirus pandemic. An alternative approach to the collection of community input into perceived health priorities was developed and agreed upon. Instead of face-to-face stakeholder dialogues and community workshops, the team opted to utilize an online survey with a concentrated effort to obtain as large a response as possible using virtual recruiting strategies.

The survey had three aims:

- To ascertain respondents' perception of the current state of their health and their family's health compared to the previous years.
- To determine whether the list of 10 health priorities from 2013 were still considered to be relevant.
- To identify new priorities that may have emerged in the current period.

Survey methodology

A data collection instrument was developed using Survey Monkey. The instrument included a mix of questions: multiple choice, forced ranking and open-ended, to generate as much usable data within a relatively short online questionnaire. The questionnaire was intentionally kept brief to enhance respondent acceptability (minimizing response fatigue and loss of motivation) and to maximize the completion rate. A pilot test was conducted, and the questions were revised and refined based on the feedback generated from the pilot.

To ensure cultural and linguistic inclusion, interviews with key opinion leaders in the CHamoru, Filipino, and Micronesian communities were carried out ascertaining the need for translated versions of the survey instrument. The CHamoru and Filipino interviewees indicated that English questionnaires would suffice; however, our Micronesian informants recommended having a Chuukese version, given the relatively large proportion of the Chuukese in the Guam community who do not speak English as their first language. A Chuukese version of the questionnaire was developed, working with an official translator in the court system. An independent bilingual individual back translated the questionnaire into English, and a revised version was finalized based on the results of the back translation.

Multipronged recruitment strategies augmented the survey's reach:

- Targeted networks: Wrote to professional and academic organizations, faith leaders, policy leaders, and educational institutions to disseminate the survey within their networks.
- Community chat groups: Connected with the village mayors to post the recruitment announcement on their community chat groups.
- Social media advertising: Purchased paid advertising through Facebook.
- Personal networks: Solicited the help of key community opinion leaders to share the recruitment announcement within their personal networks.

The objective was to achieve at least 500 completed surveys.

We utilized frequency counts and descriptive statistics for categorical and multiple-choice questions. For the forced ranking questions, we calculated a net score to determine the degree of persistent relevance (or non-relevance) of the top ten health issues identified as community health priorities in 2014. Responses to the open-ended questions were classified into thematic categories using inductive coding, and descriptive statistics were applied to the codes. Textual analysis using word frequencies and word cloud were also utilized on open-ended responses.

Responses to the categorical/multiple choice questions were disaggregated by sex, age and ethnicity to elucidate any differences across groups. Cross tabulation and chi-square analysis were conducted to determine if any statistically significant differences existed across the groups at a 5% level of significance.

Survey results

Respondent demographics

A total of 812 individuals completed the survey, representing 0.5% of Guam's total population and markedly exceeding the target of 500 respondents. This implies a 3% margin of error at a 95% confidence level, using the 2020 projected Guam mid-year population of 168,775. The 812 respondents answered all the questions, for a 100% completion rate. On average, it took respondents 6 minutes and 11 seconds to complete the survey.

Females predominated among the respondents. CHamorus were overrepresented while Other Asians were underrepresented in the respondent pool. The proportion of Filipino, White, Chuukese, and other Pacific Islander respondents were approximately similar to the relative population contribution of these ethnic groups.

Nearly 80% of respondents were aged 25 to 64 years old. Seven percent were aged 18 to 24 years, and 12.8% were 65 years or older. Multi-sectoral representation was diverse, with respondents from the following sectors:

- Health care – 11.2%
- Public health – 5.9%
- Faith community – 3.3%
- Academe/Education – 16.5%
- Business – 8.6%
- Civic organization/Non-governmental/Non-profit organization – 3.8%
- Student – 8.5%
- Community member – 15.9%
- Law enforcement – 2.7%
- Other government agency – 19.8%
- Military – 1.2%
- Farmer – 0.6%
- Media – 0.4%
- Other sector – 1.2%

Perceptions on health status

Respondents were asked how they would rate: 1) their personal health and 2) their family's health currently compared to 5 years ago. Overall, majority of respondents (42.4%) rated their personal health as "about the same" as 5 years ago. Nearly 1 in 3 (31.9%) rated their health as "worse" and 1 in 4 (25.7%) rated their health as "better" than previously. Over half of respondents (52.5%) rated their family's health as "about the same", and approximately the same percentage rated their family's health as "better" (23.3%) or "worse" (24.2%) than before.

Differences in perception of personal and family health emerged when data were disaggregated for sex, age, and ethnicity. Men were more likely to rate their health as better than previous (31.7% vs. 22.7%, $p<0.5$), while women were more likely to rate their health as unchanged (45.3% vs. 36.7%, $p<0.5$) (Graph 2). Younger respondents (24 years and under) were also more liable to report better health at present, with 1 in 3 of those aged 18-24 reporting improved health at the current time compared to only 1 in 4 of those aged 25-54, and only 1 in 5 of those aged 55 years and older. Among the various ethnic groups, Whites were the least likely to report improved health, while over half of Chuukese respondents stated their health at present was better than before. CHamorus, Filipinos, and Whites were more likely to report unchanged health than Chuukese; the difference across these ethnic groups was statistically significant (Graph 4).

There was less variability in responses to perceptions of family health. Over half of respondents felt that the health of their families remained "about the same" as before. The only significant difference was with data disaggregated by ethnicity; Chuukese were more likely to report improved health at present (51.1%) compared to all other ethnic groups; the difference was statistically significant.

Five hundred and three (503) respondents provided additional information on the reason/s behind their perception of current health status. Thematic categories that were most frequently cited included:

- Diet, nutrition, and weight changes – 37.2%
- Physical activity and exercise – 30.8%
- Development of a new or worsening of a chronic medical condition – 19.9%
- Aging – 10.1%
- Stress and mental health – 10.1%
- Health care access – 8.4%
- Lifestyle, particularly in relation to tobacco and alcohol use – 8%
- COVID concerns – 6.8%

Figure 59. Perception of personal health status by sex

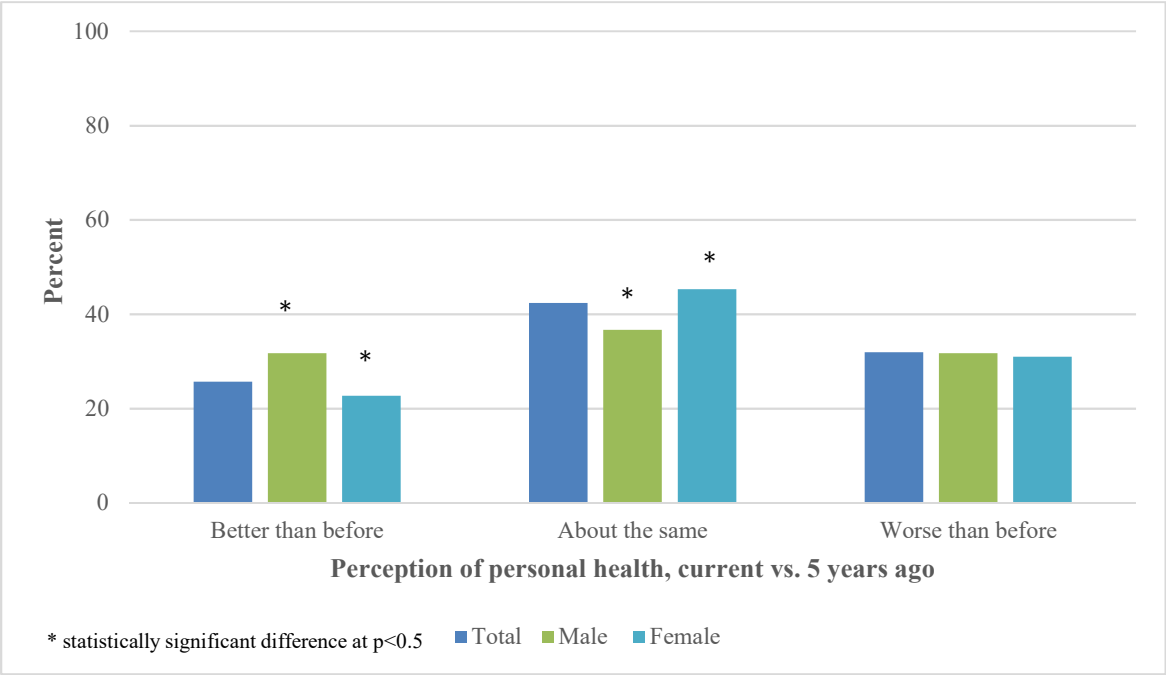
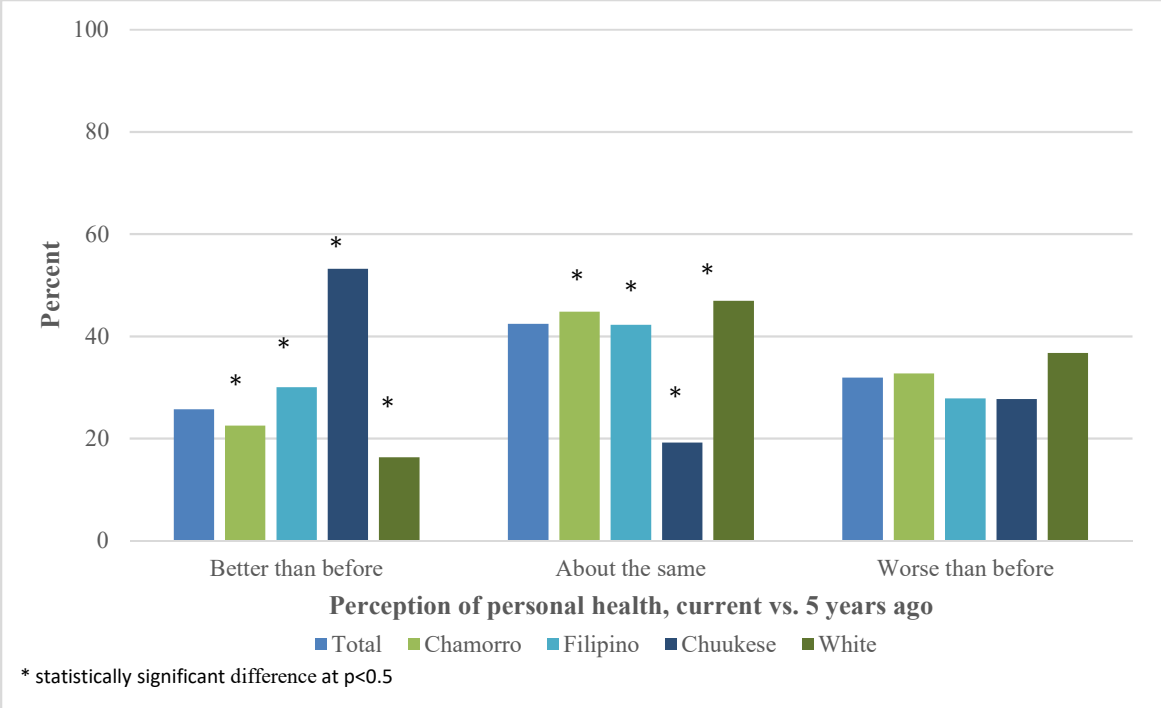


Figure 60. Perception of personal health status by ethnicity



The "stay at home" requirement during the pandemic was identified as a cause for physical inactivity and increased food consumption leading to weight gain. In particular, the lack of access to public exercise facilities and group sports were seen as factors promoting physical inactivity. Some respondents pointed out that "work from home" and "study from home" required long periods of sitting and inactivity. Among health care workers and frontline service workers, increased work demands during the lockdown hindered the ability to regularly exercise and eat healthy.

Paradoxically, other respondents saw the pandemic as an opportunity to increase their level of exercise and pay greater attention to healthy eating. They identified increased health awareness and knowledge as health promoting factors.

Among respondents who attributed their current state of health to a new or worsening health condition, over half (51%) identified a non-communicable disease (NCD) as the health issue of concern. Diabetes and cancer were the NCDs cited most often, followed by hypertension, heart disease and chronic kidney disease. Only 3% cited infectious diseases as a cause of worsened health, with only one person citing COVID infection as the reason for worse health.

Aging was associated with the emergence of new health problems and the reduction in exercise capacity.

Stress and mental health issues were linked to concerns about the pandemic, the risk to health and its financial impact. Social isolation and the increased demands from the "work from home" model were mentioned as contributing factors to depression and anxiety. One respondent indicated that the availability of mental health resources for the community was reassuring.

Respondents expressed concern about impediments to health care access arising from the pandemic, through (1) physical distancing policies that prevented them from visiting their clinical providers, (2) financial impacts of COVID leading to a loss of health care coverage, and (3) pandemic-related shifts towards pandemic control at the expense of primary care. Other access issues such as the rising costs of health care, lack of needed medical specialties, loss of coverage for specific medical services, and the poor condition of current health care facilities were also identified.

Perceptions on current relevance of previously identified health priorities

Of the 10 health priorities, the three that were most frequently perceived to be more relevant today were:

- Not enough hospital beds and health care workers
- Diabetes and heart disease
- Suicide

The COVID-19 pandemic was the single most critical factor affecting changes in perceived relevance of community health priorities. It highlighted existing health care system deficiencies, worsened access to clinical care services and elevated the risk for unhealthy consumption and mental unwellness. In addition, the shift in attention and health care resources towards pandemic control may have resulted in missed non-COVID diagnoses and delayed clinical care.

Community health priorities in 2020

Participants were asked to select 10 health priorities for 2020 and onward, using a forced ranking method. The health issues that emerged, in order of importance, were:

- NCD prevention and control
- COVID-19 pandemic mitigation
- Health system infrastructure and access
- Mental health and suicide prevention
- Substance abuse and drug addiction
- Health care financing and insurance coverage
- Domestic violence
- Food security
- Tobacco and e-cigarette use
- Health promotion and education

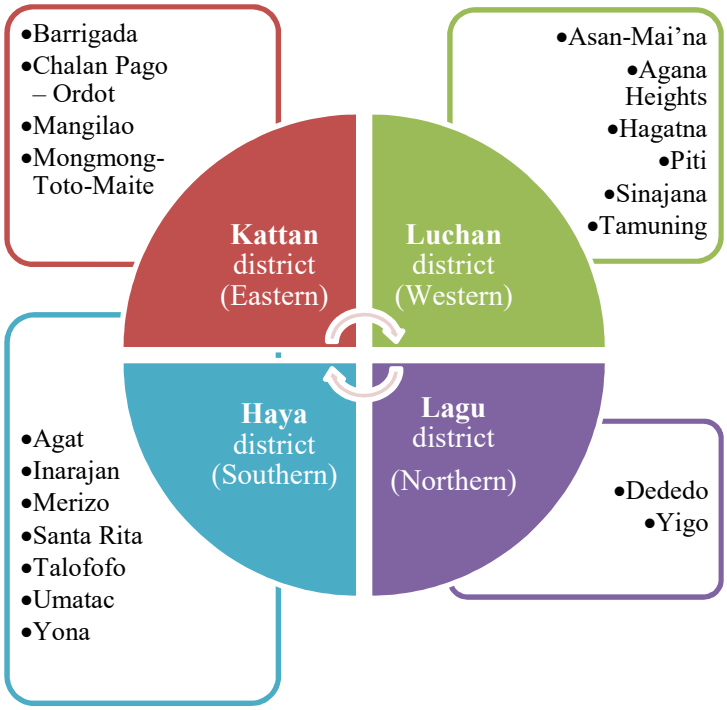
Other health issues that were mentioned but that did not have enough votes to make it to the top 10 list included:

- Climate change
- Environmental health
- Alcohol abuse
- Dengue fever
- Vaccine utilization
- Tuberculosis
- Health disparities

Community Asset Mapping

Guam has nineteen villages divided into four regions:

Figure 61. Guam districts and villages



Hospitals, urgent care, and outpatient clinics

Guam has 3 hospitals: Guam Memorial Hospital Authority (GMHA) (161 beds), US Naval Hospital (USNH) (42 beds), and the Guam Regional Medical City (GRMC) (136 beds). GRMC was constructed in 2012 and opened to the public in 2015. In addition, there is one mental health in-patient facility at the Guam Behavioral Health and Wellness Center (GBHWC) with 16 beds. The addition of GRMC boosted Guam's hospital bed per 1,000 residents' ratio from 0.93 in 2010 to 1.9 in 2018.

There are several urgent care clinics, including the Community Health Centers (CHCs) run by the Department of Public Health and Social Services (DPHSS), the military (Naval and Air Force clinics, and Veteran's Administration Outpatient Clinic), and some privately owned urgent care centers (American Medical Clinic, and Take Care/FHP). In 2019, there were 92 outpatient clinics, predominantly privately owned, and 137 physicians licensed in Guam.

The hospitals, urgent care clinics, and outpatient clinics are concentrated in the Northern (Lagu) and Western (Luchan) regions. The Southern district (Haya) is served by a lone facility – the DPHSS Southern Region Community Health Center (SRCHC).

Figure 62. Map of hospitals and urgent care clinics in Guam

Emergency response and crisis helplines

The Guam Homeland Security Office of Civil Defense coordinates and facilitates "all Government of Guam, Military, and Federal Liaison Response Agencies and their resources in mitigating, preparing, responding, and recovering from any and all types of emergencies in order to protect the lives, environment, and property of the island of Guam." It has led the response to natural disasters (typhoons and earthquakes), biological pathogens (dengue, swine flu, COVID-19) and possible radiation and explosion exposures from the threat of a nuclear strike from North Korea in 2019.

Guam has an island-wide 911 Emergency Response system that is primarily coordinated by the Guam Fire Department (GFD). This year, it is upgrading its equipment and caller system software. The 911 caller system is supplemented by an Emergency Medical Services (EMS/Ambulance) Program, inclusive of an Advanced Life Support Intercept Program.

The GBHWC independently runs a local Crisis Hotline for mental health needs, although it is currently planning to transition to the nationwide 988 Mental Health Helpline by 2022. Several non-profits and religious organizations also run 24-hour helplines for the entire island:

- Alee Shelter Hotline: (671) 648-4673 (HOPE) - For victims of domestic abuse; run by the Catholic Social Services
- VARO (Victim Advocates Reaching Out): (671) 477-5552 - For victims and families of domestic and sexual abuse and other crimes
- Healing Hearts Rape Crisis Center: (671) 647-5351

A review of online resources and directories, websites of Government and non-profit websites and interviews with several community opinion leaders resulted in the updated table of health resources and assets, subdivided by district. The Southern district has the least concentration of on-site assets.

Table 69. Health resources and assets, by district, Guam

DISTRICT: Lagu (Northern) district				
Health services	**Socio-political resources**	**Faith-based resources**	**Physical assets**	**Programs and other resources**
• Northern Region Community Health Center • Guam Regional Medical City • Private medical clinics • Pharmacies • Dialysis center • Dental clinics • Ross Hearing Center • Chiropractor clinics	• Guam Police Department (3) • Guam Fire Stations (3) • Mayors' Offices • Bingo Hall • Flea market • GABI – Farmers' Cooperative • Community Centers (2) • Adult day care center • Senior Citizens' centers (4) • Social Security Administration • Family Violence Shelter • Youth Resource Center	• Churches • Buddhist temple • Harvest Ministries	• Swimming pool • Baseball field • Basketball courts • Wettengel Rugby field • Gyms – martial arts, exercise, zumba classes • Golf courses • Paintball field • Sports facilities in private developments • Sta. Barbara field • Village parks (5)	• Zumba at the Mall • Vaccinations at the Mall • Guma San Jose homeless services and community garden • Girl Scouts of Yigo • Island Girl Power • UOG Agricultural Research Center • MADD program • Guam Football Association • Guam Animals in Need shelter • Public library (1)
DISTRICT: Haya district (Southern)				
Health services	**Socio-political resources**	**Faith-based resources**	**Physical assets**	**Programs and other resources**
• DPHSS Southern Community Health Center	• Senior Citizens' Center (5) • Community centers (5) • Youth Centers • Mayors' offices • Schools • Fire stations (7) • Day care	• Churches of various denominations	• Village parks (20) • Gyms • Recreational centers	• Community gardens and farms • Cultural programs • Community programs • NGO offices and programs • Public libraries (3)

	• Police stations (3)			
DISTRICT: Luchan district (Western)				
Health services	**Socio-political resources**	**Faith-based resources**	**Physical assets**	**Programs and other resources**
• Ambulance services/911 services • Guam Memorial Hospital • GBHWC • AMC and FHP Urgent care centers • Private clinics • Dental clinics • Chiropractor clinics	• Police patrols • GHURA offices • Mass transit resources • Senior Citizens' Center (4) • Community Centers (3) • Police stations (4) • Fire stations (4) • Mayors' offices	• Archdiocese of Agana facilities and resources	• Agana pool • Parks and recreational facilities (24) • Guam International Airport • Tumon beach; Ypao beach • Tamuning basketball and tennis courts • Recreational facilities in hotels • Water parks	• Guma Mami • Aqua Zumba classes • Public libraries (2)
DISTRICT: Kattan district (Eastern)				
Health services	**Socio-political resources**	**Faith-based resources**	**Physical assets**	**Programs and other resources**
• AMC Urgent care center • Private medical clinics • Chiropractor clinics • Dental clinics • Veterans' Administration koban	• University of Guam • Guam Community College • Other schools • National Guard Readiness Center • Phoenix Center at Father Duenas Memorial School • Senior Citizens' Center (1) • Community centers (4) • Thursday night markets • Police station (1) • Fire stations (4)	• Toto Church • Evangelical Christian Academy • Dominican day care and nursery • Faith bookstore	• Latte heights park • Village parks (5) • Basketball courts • Track and field oval at GW • Village baseball fields • Tiyan soccer and tennis fields • Gyms – Synergy, karate • Leo Palace Resort facilities	• "Just say no" dance group • Community gardens • Zumba classes • Karate gyms • Public libraries (3)

Data gaps and community concerns

Because the CHA is a data-driven process, the issues covered are those for which data is available. However, there were several data gaps noted, and community concerns raised over issues for which there was scant data.

Data gaps may arise because of the methodology for collecting population health data. For instance, the BRFSS relies on telephone outreach; households with no landlines or mobile phones would be excluded from the sampling. The YRBS collects data from the public school system, which does not include out-of-school youth (in the juvenile justice system, who may be at particularly increased risk for risky behavior and ill health), students in private schools and the military schools. Scant data are available on the military population in Guam, and health data within the military health system is not readily accessible to DPHSS.

Guam's population is relatively small. When data is disaggregated, 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.

Not much systematic data exists for environmental hazard exposures, which limits the ability of health authorities to address community concerns about their exposure risk. Some of the concerns that have been specifically mentioned include:

1. Health impact of chemical use by the military in previous decades, including Agent Orange and chemical sprays of unknown nature used in the '60s
2. Presence and health effects of genetically modified organisms and food products
3. Radiation effects from nuclear testing in previous years

Geospatial data for health issues and hazardous risk exposures would be helpful, but these data are not readily available for review by community stakeholders.

Some data used in this report are limited in scope and do not represent population data. Not all public health program data are available online, and not always included in widely circulated reports such as the Guam Statistical Yearbook. Additionally, data are not always disaggregated by ethnicity, age, sex and socio-economic status, so it is difficult to discern if disparities exist across diverse population sub-groups.

Data inaccessibility remains a key challenge, and the electrical malfunction that displaced the staff, programs, and services of the DPHSS' central facility compounded the problem. Moving forward, having a centralized electronic database with easy access for all agencies and data users would be extremely helpful in periodically assessing the health situation in the island and updating the health priorities. This data repository should include communicable and non-communicable disease registries, immunization statistics, vital statistics, information on social determinants in Guam, geospatial data for health issues and hazardous risk exposures, a detailed inventory of medical services available on island, and data on enforcement of health policies and legislation.

DPHSS and its partners will need to assess how best to address these data gaps and data needs as it configures its strategic plan of action and the Community Health Improvement Plan (CHIP) in the near future.

Conclusion and recommendations

This report provides an updated health profile for Guam and documents the process for assessing progress across the 2013 health priorities, and the selection of community health priorities in 2020. Throughout the report, whenever data were available, health indicators were linked to social determinants, particularly sex, age, educational attainment, income, and ethnicity/race. The findings confirm the intrinsic interrelationship of socio-economic status with health outcomes and underline the critical importance of redressing the greater social inequities that lead to poorer health outcomes. Towards this end, Guam should explore recent developments in enhancing health care access for the socially and economically disadvantaged, such as universal health coverage, to diminish the disparities that lead to poorer health outcomes. The data in this profile also indicate which population subgroups are most vulnerable for specific health behaviors and health outcomes and point the way forward for prioritizing the highest risk groups.

The discussions that resulted from a review of the data highlight the linkages of these various indicators, and call attention to the need for holistic and comprehensive solutions to improve health. At the same time, the data also provide compelling evidence that a significant proportion of ill health results from a relatively small number of common shared risk factors. Targeting evidence-based interventions to address this shared pool of risk factors would result in significant "wins" for public health. Many of these risk factors are behavioral; the public health community in Guam should be tasked to explore innovative options to change population behavior effectively, through policy, other environmental interventions and effective advocacy that fully utilizes the potential of today's technology and new media. These data clearly document the vital role of sound health policies in reducing health risks, particularly in relation to tobacco and alcohol use.

The COVID-19 pandemic evinced a marked influence on community perceptions of health in 2020. The pandemic sharpened the focus with which community members viewed health care gaps and vulnerabilities, and unmet health care needs. It also highlighted the importance of various components of community health that were not previously considered priorities in 2014.

The previous CHA in 2014 relied heavily on local data to drive the process of selecting priorities. This was not possible for the current assessment process for two reasons: (1) a fire at the central facility of the DPHSS resulted in significant data losses from damage to the DPHSS data servers and files, and (2) the onset of the pandemic shortly after the fire forced a compulsory re-assignment of personnel to the pandemic response teams, and data collection for non-COVID related programs was put on temporary hold. However, the COVID-19 pandemic provided the community with a personal lens to evaluate health priorities, and the collective lived experience over the past year has produced deeper insights into essential health needs and related factors that are vital to health maintenance during crisis. Thus, in some ways, this CHA has resulted in a more cohesive and practical

identification of which health issues truly matter when survival and resiliency are maximally strained.

While the priority now remains the COVID-19 pandemic itself, the respondents called attention to the inter-relatedness of the various health issues they identified. For example, the enforced lockdowns and social isolation have exacerbated anxiety and depression, led to physical inactivity and binge eating, and likely contributed to stress-related alcohol, tobacco, and other drug use. The adverse psychosocial and economic impacts arising from the pandemic, such as loss of employment and impending poverty, may have served as triggers for suicidal ideation. Job losses meant loss of health insurance coverage, for the many workers who obtain their coverage primarily through their workplace. In turn, this restricted access to health care, including care for chronic conditions, such as the various NCDs, which are prevalent among our island community, and which require regular clinic visits. Food security, which had not previously been identified as a key issue of concern in 2014, emerged as a priority, likely because people realized how sequestering the island can be a defensive strategy to prevent the influx of pathogens. However, this highlighted the island's vulnerability and dependence on food imports.

The pandemic magnified social and health disparities by demonstrating how vulnerabilities caused by health crisis are disproportionately borne by those who are already more vulnerable to health and social risks. Thus, using an equity lens as a criterion for selection of priorities is crucial. Clearly, efforts to reduce social disparities are fundamental to improving the health of our population, and multisectoral engagement will be necessary to address the root causes of inequity – the social determinants of health.

A central issue to the health improvement process is assuring every person in Guam has access to basic health care services, independent of employment or socio-economic status. Health service access, health system infrastructure and capacity and health insurance coverage were among the highest ranked health issues in the survey. The pandemic has laid bare chronic gaps in our health system infrastructure and workforce, and vulnerabilities in social protection. Now more than ever, our island has come to appreciate the importance of a strong and reliable health system, with the manpower, resources, and capacity to absorb sudden increases in demand arising from health crises. Our community also clearly recognizes the need to dismantle structural inequalities that serve as barriers to access the health system. Universal health coverage (UHC) is a strategy to address these key concerns. The United States is one of the many United Nations Member States that have committed to achieving UHC as a Sustainable Development Goal by 2030. COVID-19 is a reminder that the work towards UHC needs to begin today.

Finally, the CHA confirms the effectiveness of the community-based participatory process in engaging community partners in the health improvement cycle. The behavioral nature of needed interventions will require cross-sectoral approaches, and public health improvement will need to occur in multiple settings. Engaging critical community partners for the cross-sectoral, multi-setting strategies to improve health early on, in the planning process, ensures buy-in and participation during the developmental and implementation phases of public health improvement. It is anticipated that the data presented in this CHA report will support the succeeding phases to create and implement Guam's Community Health Improvement Plan, so that Guam will ultimately attain its vision:

"All people of Guam will have access to affordable health care, choose to live a long, more productive life (body, mind and spirit) and live in a clean environment."

CHA Report Dissemination Plan

Based on this CHA Final Report, DPHSS intends to create several community data products, including but not limited to:

- Topic-specific data briefs and fact sheets
- Health infographics
- Social media tiles
- PowerPoint presentations
- Short videos for community outreach

The final report will be posted on the DPHSS and GBHWC websites, together with other related data products. Links to the report will be disseminated on the social media pages of both agencies, and partner organizations will be requested to also post these links on their websites and social media sites. A PDF version of the report will be emailed to all the partner organizations that contributed to the data collection and review process. Hard copy versions will be printed and distributed to the Office of the Governor and Lt Governor, the Senators of the Guam Legislature, the Mayors' Council, the heads of the various relevant government agencies, the judiciary, the libraries at the University of Guam and the Guam Community College, community libraries.

Acronyms

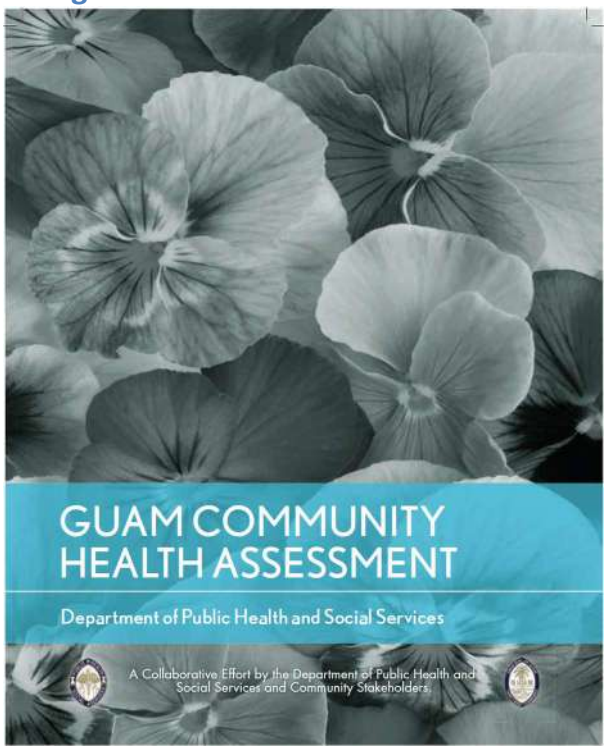
AIDS	Acquired Immunodeficiency Syndrome
BRFSS	Behavioral Risk factor Surveillance System
CDC	US Centers for Disease Control and Prevention
CHA	Community Health Assessment
CHIP	Community Health Improvement Plan
CHIPS	Country Health Information Profiles
CME	Chief Medical Examiner
COPD	Chronic Obstructive Pulmonary Disease
COVID-19	Coronavirus Disease 2019
CPS	Child Protection Services
CVD	Cardiovascular disease
DPHSS	Guam Department of Public Health and Social Services
FSM	Federated States of Micronesia
GBHWC	Guam Behavioral Health and Wellness Center
GED	General Education Development
GMHA	Guam Memorial Hospital Authority
GPD	Guam Police Department
HIV	Human Immunodeficiency Virus
HP 2020	Healthy People 2020
HS	High School
NCD	Non-communicable diseases
NCHS	National Center for Health Statistics
NHPII	National Public Health Improvement Initiative
NVSS	National Vital Statistics System
PA	Physical Activity
PHAB	Public Health Accreditation Board
PIHOA	Pacific Island Health Officers' Association
PIM	Performance Improvement Management
SAMHSA	Substance Abuse and Mental Health Services Administration
STD	Sexually Transmitted Diseases
TB	Tuberculosis
UCR	Uniform Crime Report
UHC	Universal Health Coverage
VARO	Victim Advocates Reaching Out
WHO	World Health Organization
YRBS	Youth Risk Behavior Survey
YRBSS	Youth Risk Behavior Surveillance System

List of Figures

List of Tables

Annex A: Community Health Assessment Survey 2020

Background



In 2013, Guam embarked on its first Community Health Assessment (CHA), using a community-based participatory approach to obtain feedback from a diverse set of stakeholders. The Guam Department of Public Health and Social Services (DPHSS) published and released Guam's first CHA report in 2014, with the intention of using the stakeholder input to guide strategic planning, program development, and evaluation for the period 2015-2020. This is consistent with the Public Health Accreditation Board (PHAB)'s recommendation of utilizing the CHA as a fundamental step in the community health improvement process.

In 2019, the DPHSS started the planning process for a second CHA with Dr. Annette M. David of Health Partners, L.L.C., who oversaw the CHA process back in 2013. Two events significantly affected the planning process. The first was the electrical malfunction that displaced the staff, programs, and services of DPHSS's central office, which jeopardized data retrieval pertaining to key health indicators. The second was the advent of the Coronavirus pandemic.

During a series of internal consultations and brainstorming sessions with the DPHSS CHA team, an alternative approach to the collection of community input into perceived health priorities was developed and agreed upon. Instead of face-to-face stakeholder dialogues and community workshops, the team opted to utilize an online survey with a concentrated effort to obtain as large a response as possible using virtual recruiting strategies. The survey had three aims:

- To ascertain respondents' perception of the current state of their health and their family's health compared to the previous years;
- To determine whether the list of 10 health priorities from 2013 were still considered to be relevant;
- To identify new priorities that may have emerged in the current period.

Methodology

A data collection instrument was developed using Survey Monkey. The instrument included a mix of questions: multiple choice, forced ranking and open-ended, to generate as much usable data within a relatively short online questionnaire. The questionnaire was intentionally kept brief to enhance respondent acceptability (minimizing response fatigue and loss of motivation) and to maximize the completion rate. A pilot test was conducted, and the questions were revised and refined based on the feedback generated from the pilot.

To ensure cultural and linguistic inclusion, interviews with key opinion leaders in the CHamoru, Filipino, and Micronesian communities were carried out ascertaining the need for translated versions of the survey instrument. The CHamoru and Filipino interviewees indicated that English questionnaires would suffice; however, our Micronesian informants recommended having a Chuukese version, given the relatively large proportion of the Chuukese in the Guam community who do not speak English as their first language. A Chuukese version of the questionnaire was developed, working with an official translator in the court system. An independent bilingual individual back translated the questionnaire into English, and a revised version was finalized based on the results of the back translation.

Multipronged recruitment strategies augmented the survey's reach:

- **Targeted networks:** Wrote to professional and academic organizations, faith leaders, policy leaders, and educational institutions to disseminate the survey within their networks.
- **Community chat groups:** Connected with the village mayors to post the recruitment announcement on their community chat groups.
- **Social media advertising:** Purchased paid advertising through Facebook.
- **Personal networks:** Solicited the help of key community opinion leaders to share the recruitment announcement within their personal networks.

The objective was to achieve at least 500 completed surveys.

We utilized frequency counts and descriptive statistics for categorical and multiple-choice questions. For the forced ranking questions, we calculated a net score to determine the degree of persistent relevance (or non-relevance) of the top ten health issues identified as community health priorities in 2014. Responses to the open-ended questions were classified into thematic categories using inductive coding, and descriptive statistics were applied to the codes. Textual analysis using word frequencies and word cloud were also utilized on open-ended responses.

Responses to the categorical/multiple choice questions were disaggregated by sex, age and ethnicity to elucidate any differences across groups. Cross tabulation and chi-square analysis were conducted to determine if any statistically significant differences existed across the groups at a 5% level of significance.

Survey Results

Response rate and respondent demographics

A total of 812 individuals completed the survey, representing 0.5% of Guam's total population and markedly exceeding the target of 500 respondents. This implies a 3% margin of error at a 95% confidence level, using the 2020 projected Guam mid-year population of 168,775.12 The 812 respondents answered all the questions, for a 100% completion rate. On average, it took respondents 6 minutes and 11 seconds to complete the survey.

Table 1. Demographic composition of respondents compared to Guam population

	Survey respondents	Guam population
Sex		
Male	31.9%	50.5%
Female	67.7%	49.4%
Other	0.4%	n/a
Ethnicity		
CHamoru	56.9%	37.3%
Filipino	22.2%	26.3%
Chuukese	5.8%	7%
White or Caucasian	6.0%	7.1%
Other Pacific Islander	3.4%	5%
Other Asian	2.1%	7.3%
Other	3.6%	10%

Sources: Guam census data as reported in the Guam 2017 Statistical Yearbook and CIA Factbook

Females predominated among the respondents. CHamorus were overrepresented while Other Asians were underrepresented in the respondent pool. The proportion of Filipino, White, Chuukese and other Pacific Islander respondents were approximately similar to the relative population contribution of these ethnic groups (Table 1).

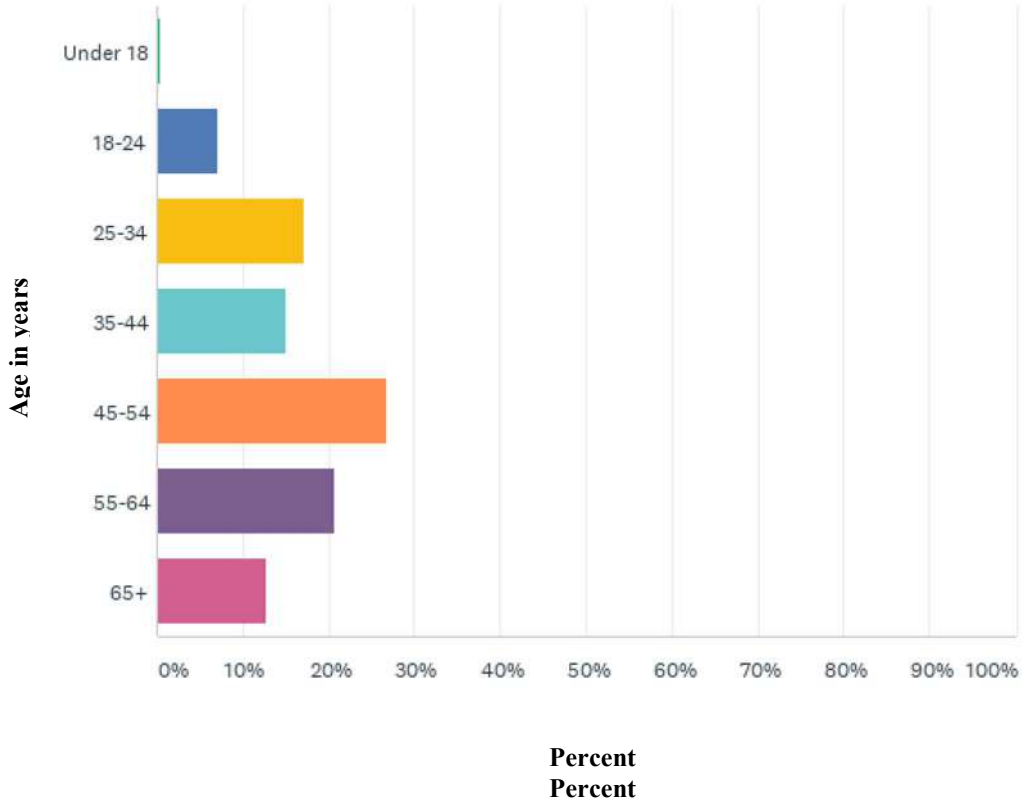
Nearly 80% of respondents were aged 25 to 64 years old. Seven percent were aged 18 to 24 years, and 12.8% were 65 years or older (Graph 1). Multi-sectoral representation was diverse, with respondents from the following sectors:

- Health care – 11.2%
- Public health – 5.9%
- Faith community – 3.3%
- Academe/Education – 16.5%
- Business – 8.6%
- Civic organization/Non-governmental/Non-profit organization – 3.8%
- Student – 8.5%

[12] United Nations, Department of Economic and Social Affairs, Population Division. World Population Prospects: The 2019 Revision. (Medium-fertility variant).

- Community member – 15.9%
- Law enforcement – 2.7%
- Other government agency – 19.8%
- Military – 1.2%
- Farmer – 0.6%
- Media – 0.4%
- Other sector – 1.2%

Graph 1. Age distribution of survey respondents



Responses

812 total responses
Equivalent to 0.5% of Guam's total population

Completion rate

100% completion rate: All respondents answered all the questions

Time spent

On average, it took respondents 6 minutes and 11 seconds to complete the survey.

Versions

There were 2 versions of the survey: English and Chuukese

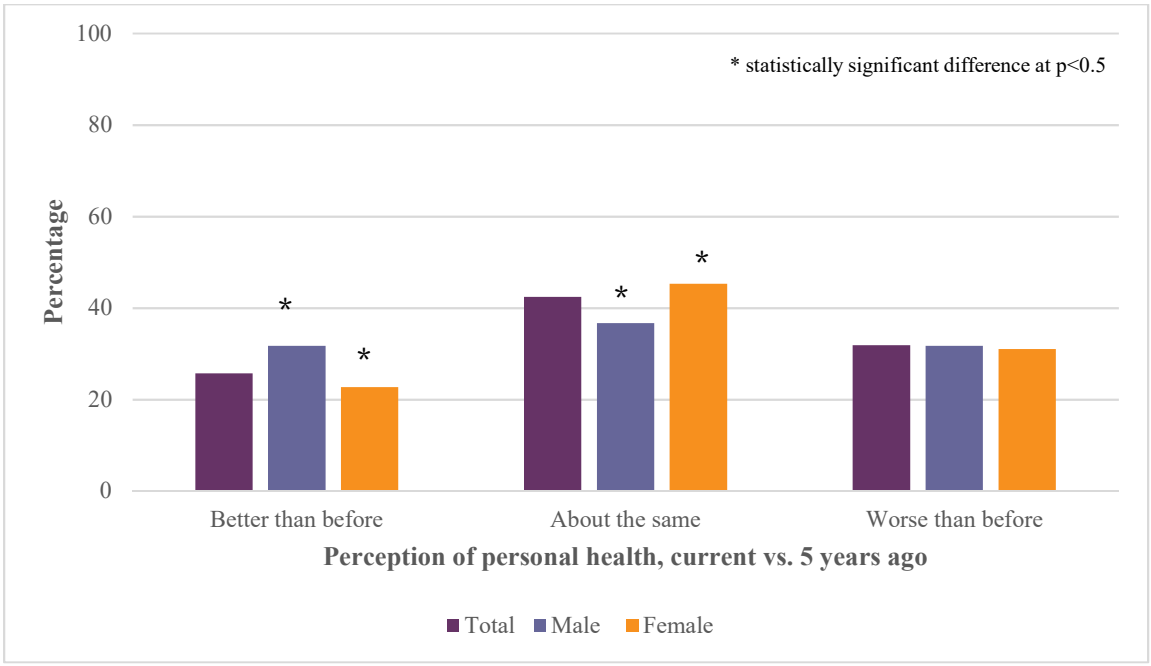
Perceptions on health status

Respondents were asked how they would rate: 1) their personal health and 2) their family's health currently compared to 5 years ago. Overall, majority of respondents (42.4%) rated their personal health as "about the same" as 5 years ago. Nearly 1 in 3 (31.9%) rated their health as "worse" and 1 in 4 (25.7%) rated their health as "better" than previously. Over half of respondents (52.5%) rated their family's health as "about the same", and approximately the same percentage rated their family's health as "better" (23.3%) or "worse" (24.2%) than before.

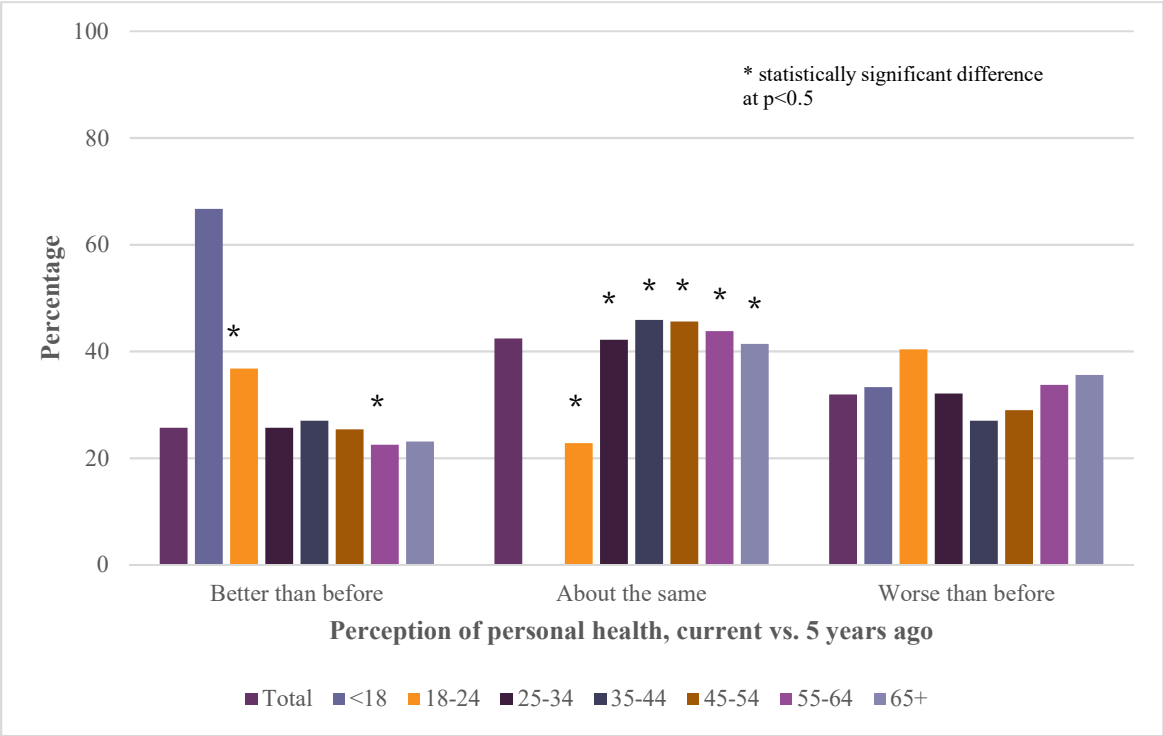
Differences in perception of personal and family health emerged when data were disaggregated for sex, age, and ethnicity. Men were more likely to rate their health as better than previous (31.7% vs. 22.7%, $p<0.5$), while women were more likely to rate their health as unchanged (45.3% vs. 36.7%, $p<0.5$) (Graph 2). Younger respondents (24 years and under) were also more liable to report better health at present, with 1 in 3 of those aged 18-24 reporting improved health at the current time compared to only 1 in 4 of those aged 25-54, and only 1 in 5 of those aged 55 years and older (Graph 3). Among the various ethnic groups, White or Caucasian were the least likely to report improved health, while over half of Chuukese respondents stated their health at present was better than before. CHamorus, Filipinos, and White or Caucasian were more likely to report unchanged health than Chuukese; the difference across these ethnic groups was statistically significant (Graph 4).

There was less variability in responses to perceptions of family health. Over half of respondents felt that the health of their families remained "about the same" as before. The only significant difference was with data disaggregated by ethnicity; Chuukese were more likely to report improved health at present (51.1%) compared to all other ethnic groups; the difference was statistically significant.

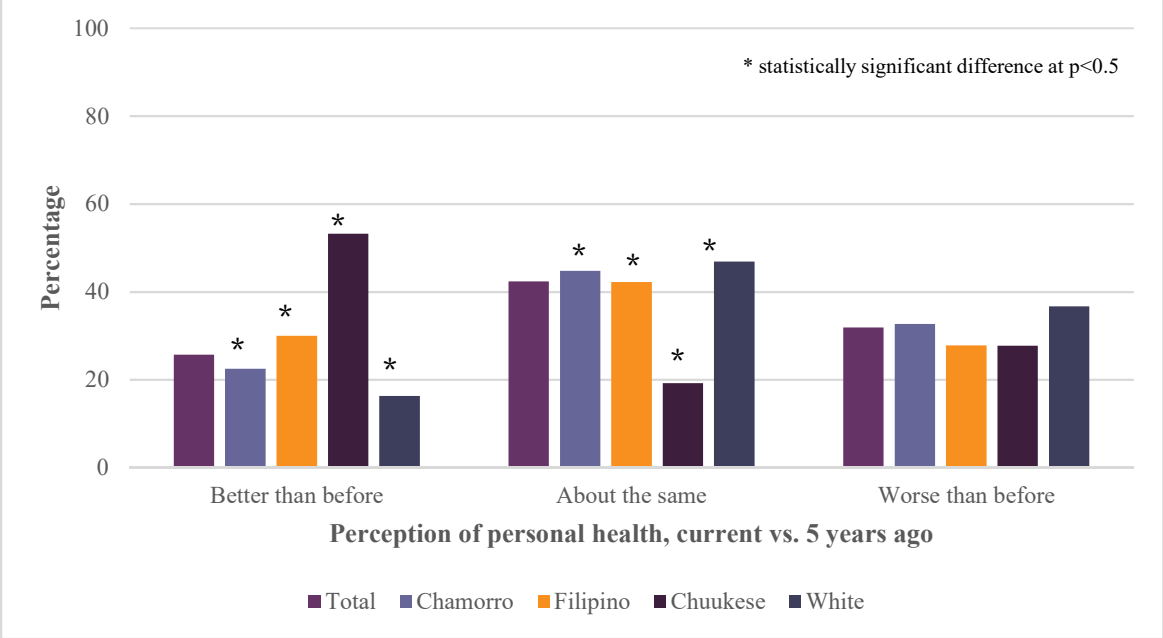
Graph 2. Perception of personal health status by sex



Graph 3. Perception of personal health status by age



Graph 4. Perception of personal health status by ethnicity



Males, younger respondents and Chuukese were more likely to report better health at present as compared to their health status 5 years ago.

Chuukese were more likely to indicate that their families' health was better than before.

- Diet, nutrition and weight changes – 37.2%
- Physical activity and exercise – 30.8%
- Development of a new or worsening of a chronic medical condition – 19.9%
- Aging – 10.1%
- Stress and mental health – 10.1%
- Health care access – 8.4%
- Lifestyle, particularly in relation to tobacco and alcohol use – 8%
- COVID-19 concerns – 6.8%

The "stay at home" requirement during the pandemic was identified as a cause for physical inactivity and increased food consumption leading to weight gain. In particular, the lack of access to public exercise facilities and group sports were seen as factors promoting physical inactivity. Some respondents pointed out that "work from home" and "study from home" required long periods of sitting and inactivity. Among health care workers and frontline service workers, increased work demands during the lockdown hindered the ability to regularly exercise and eat healthy.

> "I think my health was about the same because I wasn't as active if I were in a sport or doing regular strenuous activities, but I was walking more and towards the end of each school year I was on our school's track and field team. I now do weekly at-home workouts but am sitting more since I am doing online learning."
>
> "haven't been active since I stopped playing basketball and since COVID-19 happened."
>
> "The pandemic stopped me from attending gym classes."
>
> "Due to my work schedule, it is harder for me to find time to regularly exercise, so I have gained more weight recently."
>
> "A lot due to stress at work and school added with the pandemic that prevented me from doing more physical work causing more depression and binge eating."

Paradoxically, other respondents saw the pandemic as an opportunity to increase their level of exercise and pay greater attention to healthy eating. They identified increased health awareness and knowledge as health promoting factors.

> "I have been eating better and exercising more lately."
>
> "Over the last year I've just decided to start exercising and eating less, slowly. I've lost roughly 50 pounds and got my BMI down below 25 just in the last few weeks. I have not been fanatical about it, just more attentive."
>
> "Because I have more time to do physical fitness."
>
> "With more time spent at home, I am able to find the time to exercise. I've also changed my diet to a more plant-based diet."

Among respondents who attributed their current state of health to a new or worsening health condition, over half (51%) identified a non-communicable disease (NCD) as the health issue of concern. Diabetes and cancer were the NCDs cited most often, followed by

hypertension, heart disease, and chronic kidney disease. Only 3% cited infectious diseases as a cause of worsened health, with only one person citing COVID-19 infection as the reason for worse health.

Aging was associated with the emergence of new health problems and the reduction in exercise capacity.

Stress and mental health issues were linked to concerns about the pandemic, the risk to health and its financial impact. Social isolation and the increased demands from the "work from home" model was mentioned as a contributing factor to depression and anxiety. One respondent indicated that the availability of mental health resources for the community was reassuring.

> "…mentally and emotionally, I'm under stress because of Covid-19."
>
> "WFH (work from home), however, has impacted my mental health --it's hard to set boundaries with work-life balance."
>
> "The lack of emotional support from friends and colleagues. It's different being able to see them and converse/laugh with them physically. Also, there are a lot of anxieties present. I'm a middle school teacher and I'm still a bit conflicted with opening of schools next semester. I know that opening schools would help reduce my workload, yet the uncertainty of this pandemic and how it may affect my students make it hard to convince myself which option is better."
>
> "I feel better about my mental health and knowing there are resources available."

Respondents expressed concern about impediments to health care access arising from the pandemic, through (1) physical distancing policies that prevented them from visiting their clinical providers, (2) financial impacts of COVID-19 leading to a loss of health care coverage, and (3) pandemic-related shifts towards pandemic control at the expense of primary care. Other access issues such as the rising costs of health care, lack of needed medical specialties, loss of coverage for specific medical services and the poor condition of current health care facilities were also identified.

> "Fear of Covid cannot do health activities freely."
>
> "Because I don't have insurance anymore."
>
> "Pandemic limits my access and ability to seek medical help or follow up checkup. The Naval Hospital also reduced it services to military dependents like mammogram, dental, ..."
>
> "Health care is so expensive. My husband is retired and has insurance only for himself. With one income it's too expensive for him to carry me and we are both elderly. So I don't have any insurance."
>
> "I didn't see a doctor as often as I should due to lack of insurance and the cost of co-payments for medications and doctor visits."
>
> "I have health issues and can't afford the tests after losing my health care insurance; it doubled in price. Couldn't afford it."

"If it wasn't for COVID, I would have said better. But even if resources are available, the need shifted and COVID treatment & prevention took all of the current health care resources from primary health care."

Perceptions on current relevance of previously identified health priorities

Survey participants were asked to review the 10 health priorities identified in 2014 during the previous CHA, and to indicate if they felt each of these priorities were more relevant, less relevant, or unchanged in today's situation. The response categories were weighted: More relevance =1, Unchanged =2, Less relevant =3, Responses were tallied across categories and the mean score was calculated. [Note: Lower mean scores (close to 1) indicate perceived greater relevance.]

Of the 10 health priorities, the three that were most frequently perceived to be more relevant today were:

- Not enough hospital beds and health care workers – mean = 1.14
- Diabetes and heart disease – mean = 1.19
- Suicide – mean = 1.2

Table 2: Perception of increased or reduced relevance of health priorities

Health Priority	More relevant (1)	Unchanged (2)	Less relevant (3)	Mean Score
Unsafe sex and sexually transmitted diseases	46.7% 379	37.7% 306	15.6% 127	1.69
Risk-taking behavior among youth, particularly marijuana use, and drinking and driving	73.2% 594	20.1% 163	6.8% 55	1.34
Tobacco use	56.7% 460	26.7% 217	16.6% 135	1.60
Low vaccine utilization, with persistently high levels of vaccine-preventable diseases like influenza, measles and chicken pox	54.9% 446	30.7% 249	14.4% 117	1.59
Lung and cervical cancer	55.5% 451	37.7% 306	6.8% 55	1.51
Tuberculosis	27.8% 226	47.7% 387	24.5% 199	1.72
Not enough hospital beds and health care workers	89.0% 723	8.3% 67	2.7% 22	1.14
Few people doing cancer screening	60.0% 487	30.5% 248	9.5% 77	1.50
Diabetes and heart disease	82.6% 671	15.3% 124	2.1% 17	1.19
Suicide	84.5% 686	12.4% 101	3.1% 25	1.20

The COVID-19 pandemic was the single most critical factor affecting changes in perceived relevance of community health priorities. It highlighted existing health care system deficiencies, worsened access to clinical care services, and elevated the risk for unhealthy consumption and mental unwellness. In addition, the shift in attention and health care

resources towards pandemic control may have resulted in missed non-COVID-19 diagnoses and delayed clinical care.

> "Covid 19 has had the biggest effect on the now versus the then..."
>
> "Guam needs more facilities, certified and caring Healthcare providers to include RNs, and updated equipment…"
>
> "COVID-19 has affected the majority of these issues as identified above as people may be afraid to see a doctor or they have lost their jobs due to the on-going pandemic and may not have access to health care or even reliable transportation."
>
> "The Pandemic has changed our whole lifestyles and outlook on life. Many who have never experienced this kind of hardship are discouraged and possibly suicidal."
>
> "My general observation is that during the pandemic lockdown, more alcohol has been on display in grocery stores such as Payless and Kmart. Encouraging the consumption of alcohol and drugs are the root of increased social and medical problems in the community. Also, it appears the variety of food brought to stores has been reduced during the pandemic, which will also affect the general health of the population."
>
> "Due to current pandemic, all the primary focuses of the community has been shifted toward covid-19. So many people are getting missed diagnosed or not diagnosed at all."
>
> "It seems that Guam forgot about dengue when COVID19 hit. Guam was just starting to get a handle on tackling this health concern then it seemed that it was moved to the back burner or even forgotten. It has been raining a lot lately. Mosquitoes don't stop breeding just because the thought of them spreading dengue slipped the minds in many."

However, other respondents pointed out that the pandemic offered opportunities for better insight and motivation to improve health and lifestyles.

> "With COVID one would hope the population would be motivated to improve."
>
> "With the pandemic going on, it's really important to look at health as a whole. By this, I mean we cannot just look at physical health and think we're okay. We also need to be mindful of our emotional, mental, social, and spiritual health."
>
> "The Covid19 Pandemic has brought to the forefront the importance of vaccinations and how fragile our healthcare system is when confronted with mass illnesses and deaths!"

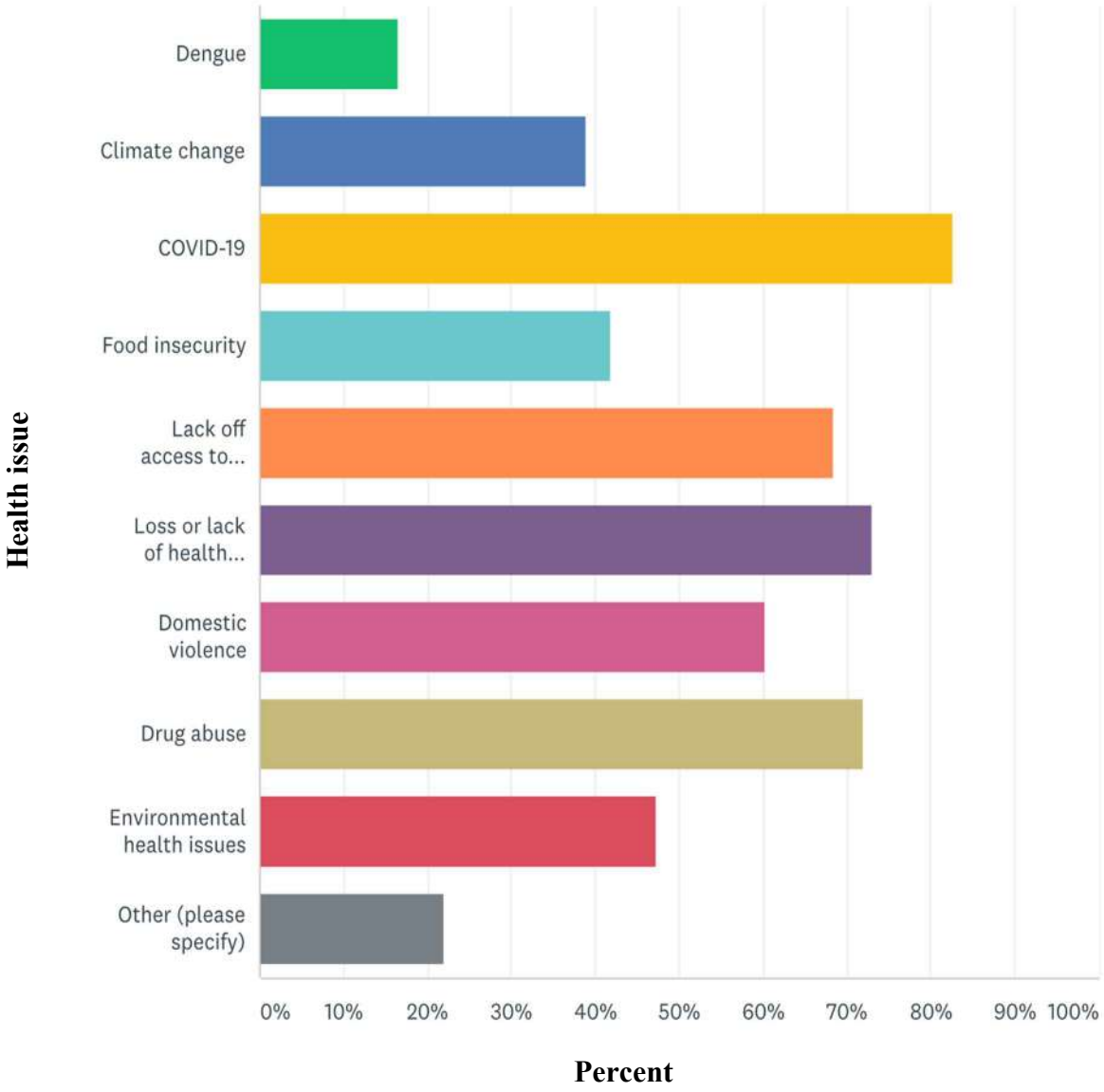
Other health priorities

Respondents identified other health priorities outside of the previous set of health issues identified in 2014-2015. Those selected by over half of the respondents included (Graph 5):

- COVID-19 – 82.6%

- Loss or lack of health insurance coverage – 73.0%
- Substance abuse – 71.9%
- Lack of access to health care – 68.5%
- Domestic violence – 60.2%

Graph 5. Other health priorities relevant to our current situation



Criteria for the selection of health priorities

Respondents were asked to rank according to importance several criteria to determine Guam's health priorities. Magnitude and severity of the health issue were considered the most important, followed by socio-economic impact and disparity. Uniqueness to Guam was ranked the least important in selecting health priorities (Table 3).

Table 3. Perceived importance of criteria for selecting community health priorities

Criterion	Very important	Important	Neither important nor unimportant	Not so important	Not important at all	Weighted average
Magnitude (how much of the population is affected)	**80.91%** 657	**16.87%** 137	**1.85%** 15	**0.37%** 3	**0.00%** 0	4.78
Severity (if affected, how serious is the patient's condition)	**78.94%** 641	**19.83%** 161	**0.99%** 8	**0.25%** 2	**0.00%** 0	4.77
Socio-economic impact	**68.10%** 553	**26.23%** 213	**4.56%** 37	**0.62%** 5	**0.49%** 4	4.61
Disparity (are vulnerable groups disproportionately affected)	**67.12%** 545	**27.83%** 226	**4.19%** 34	**0.62%** 5	**0.25%** 2	4.61
Trend (is the situation improving or worsening over time)	**62.32%** 506	**32.76%** 266	**3.82%** 31	**0.74%** 6	**0.37%** 3	4.56
Uniqueness (the issue is unique to Guam)	**56.28%** 457	**30.91%** 251	**9.85%** 80	**2.46%** 20	**0.49%** 4	4.40

Community health priorities in 2020

Finally, respondents were instructed to select the top 3 current health priorities for Guam. Responses were grouped along thematic categories and frequency counts were tabulated to determine the top 10 choices (Table 4).

Table 4. Top 10 health priorities for Guam at the present time, in descending order

Health issue	1	2	3	Total
1. NCD prevention and control	226	380	280	886
2. COVID-19 pandemic	328	37	37	402
3. Health system infrastructure and access	94	117	110	321
4. Mental health and suicide prevention	30	63	65	158
5. Substance abuse and drug addiction	50	48	59	157
6. Health care financing and insurance coverage	26	48	30	104
7. Domestic violence	4	15	25	44
8. Food security	6	15	14	35
9. Tobacco and e-cigarette use	1	8	14	23
10. Health promotion and education	4	3	13	22

Other health issues that were mentioned but that did not have enough votes to make it to the top 10 list included:

- Climate change
- Environmental health
- Alcohol abuse
- Dengue fever
- Vaccine utilization

- Tuberculosis
- Health disparities

Discussion and Conclusions

The COVID-19 pandemic evinced marked influence on community perceptions of health in 2020. The pandemic sharpened the focus with which community members view health care gaps and vulnerabilities, and unmet health care needs. It also highlighted the importance of various components of community health that were not previously considered priorities in 2014.

The previous CHA in 2014 relied heavily on local data to drive the process of selecting priorities. This was not possible for the current assessment process for two reasons: (1) an electrical malfunction displaced staff, programs, and services of the DPHSS' central facility, resulting in significant data losses and files, and (2) the onset of the pandemic shortly after the fire forced a compulsory re-assignment of personnel to the pandemic response teams, and data collection for non-COVID-19 related programs was put on temporary hold. However, the COVID-19 pandemic provided the community with a personal lens to evaluate health priorities, and the collective lived experience over the past year has produced deeper insights into essential health needs and related factors that are vital to health maintenance during crisis. Thus, in some ways, this CHA has resulted in a more cohesive and practical identification of which health issues truly matter when survival and resiliency are maximally strained.

We used a convenience (non-probability) sample utilizing exponential non-discriminative snowball recruitment to generate a large sample size within a relatively short span of time. The demographic composition of our pool of respondents indicated that our sample had an overrepresentation of females and CHamorus, and an underrepresentation of other Asians. Thus, it may not be representative of the Guam population. However, we were able to recruit 0.5% of the population, with a 100% completion rate. The use of a Chuukese version of the survey enabled the recruitment of participants who may not otherwise have had linguistic access to the survey.

In general, majority of respondents rated their personal and family's health as unchanged from previous. Differences in health ratings emerged once data were disaggregated by sex, age and ethnicity. Males, younger respondents, and Chuukese were more likely to report better health at present as compared to their health status 5 years ago. Chuukese also were more likely to indicate that their families' health was better than before.

The gender disparity in perceptions of personal health may be related to the pandemic's regressive effect on gender equality. The McKinsey Global Institute estimates that women's jobs are 1.8 times more vulnerable to the COVID-19 crisis than men's jobs; this economic fragility is compounded by the greater pressure on women to provide for unpaid care and "study at home" supervision for their children and dependents during lockdowns.[13] The adverse economic impacts may have affected their access to health care and reduced or eliminated health insurance coverage. Moreover, lockdowns, restricted

[13] Madgavkar A, White O, Krishnan M, Mahajan D and Azcue X. COVID-19 and gender equality: Countering the regressive effects. McKinsey Global Institute. July 15, 2020. Available at https://www.mckinsey.com/featured-insights/future-of-work/covid-19-and-gender-equality-countering-the-regressive-effects#

movements and social isolation may have contributed to increased gender-based violence[14]; this may also explain the emergence of domestic violence as a perceived health priority for 2020 in Guam.

Respondents pinpointed aging as a major contributor to worsening health. Not surprisingly, younger respondents were more likely to classify their health as better than before, as compared to their older counterparts.

In the past decade, various public health programs and health assessments have identified Chuukese as a vulnerable group for health disparities. This has resulted in an increased focus on allocating health care resources and program services for Chuukese and may help explain why they are more likely to rate their personal and family health as better than in the past 5 years.

Of the previous 10 health priorities, health system capacity and workforce, NCD prevention and control (particularly diabetes and heart disease), and suicide prevention were rated as more relevant in light of the COVID-19 health crisis. Other health issues of concern that emerged included the COVID-19 pandemic, lack of access to health care, loss of health insurance coverage, substance abuse, and domestic violence. The pandemic, with the surge in demand for clinical care, has highlighted chronic gaps in health system resources, facilities, and workforce. Current "stop-gap" measures have been implemented through collaborative partnerships between the public and private healthcare sectors and the military to meet anticipated "surge" from COVID-19; however, definitive solutions that are sustainable are needed to offset any future health crises. Pandemic preparedness needs to be integrated into health systems strengthening, to prepare and anticipate future health emergencies.

While the priority at the moment remains the COVID-19 pandemic itself, the respondents called attention to the inter-relatedness of the various health issues they identified. For example, the enforced lockdowns and social isolation have exacerbated anxiety and depression, led to physical inactivity and binge eating, and likely contributed to stress-related alcohol, tobacco and other drug use. The adverse psychosocial and economic impacts arising from the pandemic, such as loss of employment and impending poverty, may have served as triggers for suicidal ideation. Job losses meant loss of health insurance coverage, for the many workers who obtain their coverage primarily through their workplace. In turn, this restricted access to health care, including care for chronic conditions, such as the various NCDs, which are prevalent among our island community, and which require regular clinic visits. Food security, which had not previously been identified as a key issue of concern in 2014, emerged as a priority. This highlighted the island's vulnerability and dependence on food imports.

The pandemic magnified social and health disparities by demonstrating how vulnerabilities caused by health crisis are disproportionately borne by those who are already more vulnerable to health and social risks. Thus, using an equity lens as a criterion for selection of priorities is crucial. Clearly, efforts to reduce social disparities are fundamental to

[14] United Nations. Policy brief: The impact of COVID-19 on women. April 9, 2020. Available at: https://www.unwomen.org/-/media/headquarters/attachments/sections/library/publications/2020/policy-brief-the-impact-of-covid-19-on-women-en.pdf?la=en&vs=1406

improving the health of our population, and multisectoral engagement will be necessary to address the root causes of inequity – the social determinants of health.

A central issue to the health improvement process is assuring every person in Guam access to basic health care services, independent of employment or socio-economic status. Health service access, health system infrastructure and capacity, and health insurance coverage were among the highest ranked health issues in the survey. The pandemic has laid bare chronic gaps in our health system infrastructure and workforce, and vulnerabilities in social protection. Now more than ever, our island has come to appreciate the importance of a strong and reliable health system, with the manpower, resources and capacity to absorb sudden increases in demand arising from health crises. Our community also clearly recognizes the need to dismantle structural inequalities that serve as barriers to access the health system. Universal Health Coverage (UHC) is a strategy to address these key concerns[15]. The United States is one of the many United Nations Member States that have committed to achieving UHC as a Sustainable Development Goal by 2030. COVID-19 is a reminder that the work towards UHC needs to begin today.

Finally, as a testament to our population's resiliency mindset, respondents pointed out to this pandemic as a learning opportunity to empower our community through intensive outreach, education, and health promotion. The crisis challenges us to pivot our mindset and tap into our collective resourcefulness to find creative ways to continue improving our health despite the pandemic, using technology and innovation. Thus, health promotion and education also emerged as a priority going forward.

Acknowledgements

The CHA 2020 is a collaborative effort of the DPHSS and the people of Guam. Ms. Bertha Taijeron and Ms. Mathi Matthews at DPHSS provided oversight of the process. Dr. Annette M. David of Health Partners, L.L.C. developed the survey instrument, facilitated data collection and analysis and served as the lead technical writer for the report. Ms. Karma Mori served as the lead translator for the Chuukese version of the survey. The large number of respondents was the result of collective efforts by the heads of various GovGuam agencies, including the office of the Governor and Lt. Governor, the mayors, faith-based leaders, health care organizations and community leaders and health advocates who assisted in disseminating the survey and recruiting respondents. Ultimately, this report is a testament to the community spirit that reflects the character of Guam's people. Dangkalo Si Yu'os Ma'åse'!

[15] United Nations. Policy brief: COVID-19 and universal health coverage. October 2020. Available at https://unsdg.un.org/sites/default/files/2020-10/SG-Policy-Brief-on-Universal-Health-Coverage_English.pdf

Annex B: Stakeholder Listing

The following agencies, programs and individuals participated in the Community Health Assessment, and provided input into the final report findings.

The major contributors of data:

- Department of Health and Social Services – BRFSS and disease program data, vital statistics data
- Guam Behavioral Health and Wellness Center/State Epidemiological Outcomes Workgroup – Suicide, mental health, alcohol, tobacco, and other drug use data
- Guam Department of Education – YRBS data, school enrollment data
- Bureau of Statistics and Plans – Demographic and census data
- Guam Police Department – Crime and safety data
- Guam Memorial Hospital Authority – Hospital data
- Office of the Chief Medical Examiner - Suicide data

Community partners who contributed to providing and reviewing data, and offering feedback from the community perspective:

External partners for the STD/HIV/Viral Hepatitis/TB programs	
Organization	**Special population represented**
AmeriCorps	
Catholic and Private schools	Youth and young adults
Catholic Social Services	Indigent population
Department of Corrections Residential Substance Abuse Treatment (RSAT) Program	Persons recovering from drug and/or alcohol dependence
Guam Behavioral Health and Wellness Center (GBHWC) - New Beginnings Drug and Alcohol Treatment Program	Persons recovering from drug and/or alcohol dependence
Guam Cancer Care	
Guam Caregivers Association	
Guam Community College (GCC) Health Services Center	Youth and young adults
Guam Department of Education (GDOE)	Youth and young adults
Guam Diabetes Association	
Guam Homeless Coalition	Homeless
Guam Medical Association/Society	
Guam Nursing Association	
Guam Pharmacist Association	
Guam's Alternative Lifestyle Association (GALA)	LGBTQ community
Maňe'lu (formerly Big Brothers, Big Sisters Guam)	Youth and young adults
Micronesian Resource Center One-Stop Shop	Micronesian population
Oasis Empowerment Center	Persons recovering from drug and/or alcohol dependence
Salvation Army - Lighthouse Recovery Center	Persons recovering from drug and/or alcohol dependence
Sanctuary, Incorporated	Youth and young adults
Todu Guam	
United States Affiliated Pacific Islands (USAPI) Health Department counterparts	Micronesian communities

University of Guam (UOG) Student Health Services Center	Youth and young adults
WestCare Pacific Islands - GUAHAN Project	

Members of the Governor's PEACE Council (Prevention and Community Empowerment)		
Member	**Organization**	**Special population represented**
Barcinas, Peter	UOG, Cooperative Extension Services	Youth and young adults
Brennan, Melanie W.	Department of Youth Affairs (DYA)	At-risk youth
Camacho, Victor	Sanctuary	At-risk youth
Castro, Catherine	Chamber of Commerce	
Chief Ignacio, Steve	Guam Police Department (GPD)	
Dela Cruz, Tim	GALA	Lesbian, Gay, Bisexual, Transgender, and Queer (LGBTQ) community
Dr. David, Annette M.	State Epidemiological Outcomes Workgroup (SEOW)	
Esplana, Deana	Guam Army National Guard (GU ARNG)	Military
Fernandez, Jon	GDOE	Youth in public schools
Hahn, Brian	Tohge, Inc.	Those recovering from mental health/substance use
Lape, Angelina C.	Head Start, DOE	
Manibusan, LouAnn	Supreme Court of Guam	
Mayor Robert Hoffman	Mayors' Council of Guam (MCOG)	
McGill, Bernice A.	Game Time	Youth
McManus, Andresina	Southern Christian Academy (Faith Based)	Faith community
Moylan, Jesrae	Community Member	
Roberto, Joachim Peter	GCC	Youth and young adults
Rupley, Sean	Youth For Youth LIVE! Guam (YFYLG)	Youth
Senator Therese Terlaje	Guam Legislature	
Sgambelluri, Gianna	Grief Recovery Method	
	Guam Memorial Hospital Authority (GMHA)	
	Department of Public Health and Social Services	

Members of the NCD Consortium		
Member	**Organization**	**Special population represented**
Acosta, Mark	UOG	Youth and young adults
Aflague, Tanisha	Individual	
Aguon, Doris	Department of Labor (DOL)	
Alam, Lawrence	DPHSS	
Almonte, Glynis	Mountain Pacific Quality Health	
Artero, Marisha	American Cancer Society	
Barber, Bob	UOG	Youth and young adults
Barcinas, Clarissa	UOG	Youth and young adults
Bell, Margaret	DPHSS	
Benitez, Christian	BSP Health Coach	
Benito, Marie	Island Girl Power (IGP)	Young women and girls
Blaz, Juanita	IGP	Young women and girls
Blaz, Natalie	IGP	Young women and girls
Bonto, Arlie	DPHSS	
Bordallo, Grace	DPHSS	
Bordallo, Renta	UOG	Faith community
Brown, Audrey	IGP	At-risk youth
Brown, Wayne	Department of Defense (DOD) / American Federation of Government Employees (AFGE)	Military
Calvo, Rosae	Payless Market	
Camacho, Christine	Andersen Middle School	Youth
Camacho, Esther	Bureau of Statistics and Plan (BSP)	
Camacho, Joshua	IGP	Young women and girls
Camacho, Katrina	Individual	
Castillo, Arcy	DPHSS	
Castro, Cassandra	TakeCare Insurance Company	
Castro, Cathy	Individual	
Castro, Eileen	IGP	Young women and girls
Charfauros, Joey	MCOG	
Colet, Vinnie	Retired	
Cruz, Jaimie	Individual	
Cruz, Karen	UOG	Youth and young adults
Cruz, Peter	GBHWC	
David, Annette	Health Partners, LLC	
Del Mundo, Naomi	Guam Cancer Registry	
Delma-Ala, Kevin	UOG	
Diaz, Teresa	UOG	

Dimla, Sara	GBHWC	
Dizon, John Louie	Individual	
Drake II, John	Tohge, Inc.	Those recovering from mental health/substance use
Duenas, Garrette	Tohge, Inc.	Those recovering from mental health/substance use
Dugies, Lourdes	Retired	
Flynn, Linda	Retired	
Gabriel, Joshua	UOG	
Gatus, Lakita	Individual	
Gay, Margarita	DPHSS	
Grina, Rose	Family Health Plan (FHP) Clinic	
Guerrero, Elizabeth	DPHSS	
Guerrero, Monica	BSP	
Hamilton, Rettasue	Amot Farm	
Harrel, Sara	GBHWC	
Hautea, Junelyn	DPHSS	
Henson, Cythia	Diagnostic Laboratory Services, Inc. (DLS)	
Kalinauskas, Zachary	Tobacco Control Action Team (TCAT)	
Kaneshiro, Suzanne	DPHSS	
Labrador, Myrna	Individual	
Laguana, Ronald	DOE	
Law, Jade	UOG	
Little, Donabel	TakeCare Insurance Company	
Lopez, Charry	Volunteer	
Loren, Nicole	DPHSS	
Luces, Patrick	DPHSS	
Lujan, Armilyn	Department of Administration (DOA)	
Lujan, Jon	Individual	
Mafnas, Barbara	GCC	Youth and young adults
Manibusan, April	BSP	
Manibusan, Evangeline	Guam Nurse Association	
Martinez, Luis	US Naval Hospital (USNH)	Military
Mathews, Mathi	DPHSS	
Medina, Emilio	Guam Cancer Registry (GCR)	
Meier, Neli	Andersen Air Force Base (AAFB)	Military
Mendiola, Gloria	UOG	Youth and young adults
Mendiola, Jennifer	DPHSS	
Metra, Leah	St. Anthony Catholic School (SACS)	Youth

Mizusawa, Gordon	GMHA	
Montano, Melani	PRCCR Pacific Regional Central Cancer Registry (PRCCR)	
Moore, Tiffany	IGP	Young women and girls
Mummert, Angelina	UOG	Youth and young adults
Nededog, Evelyn	DPHSS	
Nededog, Paul	DOE	Youth and young adults
Nelson, Bernie	Amot Farm	
Pareja, Vivian	DPHSS	
Paulino, Yvette	UOG	Youth and young adults
Pehlivanian, Sebastian	Individual	
Perez, June	GMHA	
Perez, Maria Isabel	Guam Regional Medical City (GRMC)	
Perez, Mary Ann	Health Coach DPHSS	
Perez, Nona	Guam Cancer Care	
Perez, Rynette	UOG	Youth and young adults
Portela, Adelina	DPHSS	
Quito, Karina	Guam Cancer Care	
Ramirez, Rachel	DPHSS	
Reyes, Ester	DOL	
Rodriguez Jr., Dennis	Senator Rodriguez's Office	
Sablan, Matthew	DOE	
Sablan, Samantha	Custom Fitness	
Sana, Brenda	Guam Radiology Consultants (GRC)	
Santiago, Cherisse	DPHSS	
Santos, Diana	DPHSS	
Santos, Eugene	Church	Faith-based community
Santos, Jeremiah	Tohge, Inc.	Those recovering from mental health/substance use
Silverio, Alexis	DPHSS	
Solidum, Adoracion	Individual	
Solidum, Aurelio	Individual	
Somera, Lilnabeth	UOG	Youth and young adults
Sotto, Karl	Self Employed	
Spears, Lajoy	TCAT	
Taijeron, Bertha	DPHSS	
Taisipic, Laura	Individual	
Taitague, Esther	BSP	
Talavera, Tom	GBHWC	
Tayama, Betty	DOA	
Torres, Enrique	DPHSS	

Toves, Dean	Tohge, Inc.	Those recovering from mental health/substance use
Ubaldo, Christine	SelectCare	
Uncangco, Alyssa	DPHSS	
Uncangco, Pacita	DOA	
Van Boxtel, Bethany	Good Samaritan Hospital Guam	
Veksler, Renee	GMHA	
Wall, Phoebe	UOG	Youth and young adults
Wang, Alan	DOL	
Warfield, Jeffrey	Department of Integrated Services for Individuals with Disabilities (DISID)	Persons with disabilities
Weiss, Stephen	Individual	
White, Angie	Mountain Pacific Quality Health	
Young, Melliza	GRMC	

Members of the Guam State Epidemiological Outcomes Workgroup (SEOW)		
Member	**Organization**	**Special population represented**
Barcinas, Peter	University of Guam Cooperative Extension Services (UOG-CES)	Youth and young adults
Benavente, Audrey	GBHWC	
Camacho, Esther M.	BSP	
De La Cruz, Tim	GALA	LGBTQ community
Dr. David, Annette M.	Health Partners, L.L.C.	
Dr. Paulino, Yvette	University of Guam Cancer Research Center	
Dr. Somera, Ray	Guam Community College (GCC)	
Dr. Young, Melliza C.	GRMC	
Flynn, Linda	GBHWC	
Guerrero, Monica J.	BSP	
Mariano, Cerina	Juvenile Drug Court, Superior Court of Guam	At-risk youth
Nededog, Paul	GDOE	Youth
Paulino, Helene	DPHSS	
Rosadino, Mary Grace Lapid	Juvenile Drug Court, Superior Court of Guam	At-risk youth
San Nicolas, Evan	GALA	LGBTQ community
Sanchez, Eloise	GDOE	Youth
SFC Corina, Andrea	GU ARNG	Military
SSgt Samina, Zenia	GU ARNG	Military
	GPD	
	DYA	At-risk youth
	GMHA	

	Sanctuary, Incorporated	At-risk youth
Uncangco, Alyssa	DPHSS	

Members of the Guam Comprehensive Cancer Control Coalition		
Member	**Organization**	**Special population represented**
Alejandro, Sarah	Individual	
Ambrale, Samir	Individual	
Artero, Marisha D.	American Cancer Society (ACS)	
Badowski, Grazyna, PhD	University of Guam Cancer Research Center	
Baza, Joleen	Blue Ocean Medical Group	
Benito, Marie	Circle of Care Support Services	
Bordallo, Renata	Guam Cancer Registry, University of Guam (UOG)	
Borja, Alicia	University of Guam Cancer Research Center	
Borja, Louisa	Sorensen Media Group	
Calvo, Jennifer	Edward M. Calvo Cancer Foundation	Indigent cancer patients
Camat, Ruth M.	Guam Seventh-Day Adventist Clinic (SDA)	
Castro, Catherine Marie Rivera	Individual	
David, Annette M.	Health Partners, LLC	
Del Mundo, Naomi	Guam Cancer Registry, University of Guam (UOG)	
Diaz, Tressa P.	UOG Cancer Research Center, Community Outreach Core	
Frank, Linda	Individual	
Grino, Rose P	FHP Health Center	
Guerrero, Elizabeth A.	Guam Breast & Cervical Cancer Early Detection Program, DPHSS	
Hemlani, Kavita	Individual	
Henson, Cynthia	Diagnostic Laboratory Services, Inc. (DLS)	
Joo-Castro, Lucy H.	Individual	
Lin, Lhyza	Guam Seventh-day Adventist Clinic (SDA)	Faith-based community
Mabute, Charise	Racial and Ethnic Approaches to Community Health (REACH) program	Ethnic communities
Mendez, Ana Joy P.	University of Guam Cancer Research Center	
Mummert, Angelina G.	UOG Cancer Research Center, Community Outreach Core	
Ngirachelsau, Honlein	Guam Cancer Care	
Ongrung, Ellie S.	Guam Cancer Care	

Palaganas, Harmony Dorilisa	UOG Cancer Research Center, Community Outreach Core	
Pareja, Vivian	Guam Comprehensive Cancer Control Program, DPHSS	
Patricio, Gerry	FHP Health Center	
Paulino, Yvette C.	UOG	
Perez, Nona	Guam Cancer Care	
Prudente, George	Guam Cancer Care	
Ramirez, Rachel	Guam Breast & Cervical Cancer Early Detection Program, DPHSS	
Refugia, Lymona Marie	Guam Cancer Registry, University of Guam (UOG)	
Reyes, Ryan	Guam Cancer Care	
Rhoads, Olynne L.	Guam Cancer Care	
Rosales, Jessica	Guam Cancer Care	
Sana, Brenda	Individual	
Sapalo, Dahlia	Guam Cancer Care	
Sotto, Karl	Individual	
Sotto, Patrick	Individual	
Spak, Eric W., MD	Individual	
Taitano, John Ray	Cancer Council of the Pacific Islands Rep., The Doctor's Clinic	
Yamanaka, Remylynn	University of Guam- Guam Cancer Trust Fund	
Young, Melliza C.	GRMC	

Annex C: Agenda of SEOW Meeting where final review of CHA data was accomplished

Guam State Epidemiological Outcomes Workgroup
(SEOW)

Meeting Agenda

15 December 2021
10:00am – 11:00am
Zoom virtual meeting

1. **Call to Order**
2. **Introductions**
3. **Review of Minutes – September 8, 2021**
4. **Old Business –**
   a. Update on GoPEACE conference and PFS grant implementation – Sara Harrell
   b. Update on FOL – KristiAnna Whitman
   c. Update on SAPT – Michelle Sasamoto
5. **New Business**
   a. 2019 BRFSS core questions by ethnicity – Annette David
   b. 2020 DPHSS CHA Survey – Annette David
6. **Announcements and Member organization Updates**
   a. Census data products and census characteristics needed by stakeholders – Esther Camacho
7. **Next Meeting Date**
8. **Adjournment**

Note-taker: Ms. Audrey Benavente

This work is supported by funds made available from the Centers for Disease Control and Prevention (CDC) of the U.S. Department of Health and Human Services (HHS), National Center for STLT Public Health Infrastructure and Workforce, through OE22-2203: Strengthening U.S. Public Health Infrastructure, Workforce, and Data Systems grant. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by CDC/HHS, or the U.S. Government.