

Republic of Palau, Ministry of Health

# National Health Profile 2013



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December 2014





# Forward

December 10, 2014

Thank you for your interest in the health of Palau. This report aims to present the most accurate and current data on available health indicators collected within the nation. The 2013 National Health Profile serves as a tool to identify health trends, direct strategic planning, and provide support for decision and policy making.

This profile was organized through public health accreditation efforts by the Bureau of Public Health division chiefs and program managers, reviewed and revised based on community feedback. Palau began work towards voluntary accreditation in 2010 when awarded the National Public Health Improvement Initiative grant to enhance system organization and public health practice<sup>1</sup>. In Palau, this award has supported the development of the Ministry's quality improvement office and performance improvement management system.

The Ministry of Health is committed to continuous quality improvement in both our delivery of primary care and public health programs in order to fulfill our vision: *Healthy communities with access to high quality health care services*. To do this, it is essential to consider the indicators presented in this report and reach for measurable targets.

Sincerely,

  
Berrymoon Watson, MPH  
Director, Bureau of Public Health

  
Gregorio Ngirmang  
Minister of Health

<sup>1</sup> [www.cdc.gov/stlpublichealth/nphii/about.html](http://www.cdc.gov/stlpublichealth/nphii/about.html)



# Acknowledgements

This report would not have been possible without the collaborative effort of the Ministry of Health leaders who contributed their reports, data, and input throughout the development of this document.

A special thank you is extended to the Palau State Epidemiologic Workgroup who made significant contributions with their own annual reports and lead author Dr. Haley Cash for her generosity and expertise.

Lastly, we would also like to acknowledge the collective efforts of the MOH employees who were in the community collecting health data.

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# Executive Summary

Palauans strive to be healthy people in a healthful environment undertaking particular measures in the past decade to ensure this vision. In 2010, Palau passed the Healthcare Financing Act, establishing the nation's first healthcare financing program, which includes National Health Insurance and Medical Savings Accounts.

Over the past 50 years with the introduction of Western culture, a shifting of lifestyles, and an introduction of new technologies, the health of Palauans has changed considerably. Morbidity and mortality are now heavily impacted by behavioral risk factors and noncommunicable diseases and significantly less by communicable diseases, although some tropical diseases persist today. The National Health Profile serves as a tool to evaluate trends in health to anticipate and strategize ways in which to continue to improve the health of the community.

## Mortality

Life expectancy in Palau has increased slightly over the past decade yet remains well below the average life expectancy of the U.S. (Palau, 64 years vs. U.S., 80 years). In 2012, the leading causes of death were all related to noncommunicable diseases with 34% of deaths attributed to cerebrovascular/cardiovascular disease, followed by cancer (21%) and diabetes (14%). There are also a high number of deaths caused by injury, particularly in males, both drowning and suicides. The suicide rate in Palau is very high at approximately 21.7 deaths per 100,000 people.

## Risk Factors

Palau has a high prevalence of many of the known risk factors for noncommunicable diseases. Both smoking and chewing tobacco (in the form of betel nut) among students in Palau are considerably higher than in the U.S.; approximately 2.5 times higher for smoking and 4.0 times higher for chewing tobacco. Also, students in Palau tend to eat less fruits and vegetables on a daily basis than their U.S. counterparts. Self-reported prevalence of overweight/obesity are slightly lower in Palau students than in both Guam and the U.S. mainland, there is evidence to support these rates are underestimated. Two-thirds of Palauan adults are overweight or obese with BMI  $\geq 25$ .



# Executive Summary

## Noncommunicable Diseases

Since being declared a regional emergency in 2010, over 30 local and regional organizations have partnered with Palau's Ministry of Health to combat this epidemic. Estimated prevalence of cerebrovascular/cardiovascular disease and diabetes is lower in Palau than both Guam and the U.S., however, the validity of these measures should be considered in light of the higher prevalence of overweight/obesity seen in Palauan adults. Also to note is the relatively low prevalence of depression in adults compared to the high prevalence of depression among students in Palau. It is essential for Palau MOH to continue building its surveillance systems in order to fully grasp the scope of the NCD emergency.

## Communicable Disease

Over the past half-century, many communicable diseases have become less prevalent, especially food and vector-borne diseases, due in part to the strength of the Division of Environmental Health. One great success is the decrease in new Hepatitis B, cases which have dropped by 78% since 2006. The rates of sexually transmitted infections remain alarmingly high; Chlamydia and syphilis are 2.5 and 11.4 times the U.S. incident rate, respectively. Also, Dengue Fever remains endemic to Palau with the last outbreak (202 cases) in 2008. Furthermore, Palau has failed to reach the WHO's Hansen's disease elimination goal of less than 1 case per 10,000 persons by reporting an 7-average of 3 new cases each year.

## Maternal & Child Health

The total fertility rate in Palau remains steady around 2 births per woman. The infant mortality rate is high but these deaths are rare. Approximately one-quarter of births are to women of advanced maternal age. Along with a high prevalence of tobacco use during pregnancy, these two factors may be contributing to adverse birth outcomes, such as pre-term and low birth weight babies. While approximately 50% of expecting mothers are receiving "adequate" prenatal care, MOH is working to increase these numbers. Another concern is the degree of oral disease in Palauan children which is approximately 5 times more severe than that of the U.S..



# Executive Summary

## Environmental Health

The Ministry of Health's Division of Environmental Health Food Handler's Program is responsible for decreasing rates of food-borne illnesses over the past decade. Consumer Protection program continues to monitor imported food and condemn recalled, expired, and damaged food products. Rates of vector-borne disease have declined as DEH conducts weekly mosquito surveillance throughout Koror. DEH has identified seasonal fluctuations in pupa/larva counts and reacts to keep these counts below threshold. Forty-percent of the Division's Emerging Issues and Special Environmental Investigations program are related to elevated lead levels, which they attribute to handling and re-purposing used motor vehicle batteries.

## Conclusion

As the leading cause of death in Palau, the country and the region need to continue to emphasize the significance of noncommunicable disease. Although life expectancy has slightly increased over the past decade, quality of life may be affected by these diseases and are adding economic strain to the health system. Tobacco use and obesity have been identified as prevalent risk factors of NCDs in Palau and evidence-based programs targeting youths may be particularly effective in halting this epidemic.

It is important to continue these systematic health assessments that set benchmarks for health indicators and document health trends. Future assessments could be strengthened by including partners outside the Ministry of Health as improving the health of the people of Palau is not a task solely for the public health or health care systems alone but rather a collaboration requiring health-focused agencies, the education system, economic development agencies, planning and infrastructure development partners, private business leaders, not-for-profit organizations, policymakers, and traditional leaders.



# Introduction

## Background

The Republic of Palau may be one of the smallest of the Pacific Islands, but is world renowned for its unique geographic beauty including the UNESCO World Heritage Rock Islands and complex coral reefs, which sustain a large diversity of plants, birds, and marine life. These islands have the highest concentration of marine lakes anywhere, including the famous Jellyfish Lake. Unique to Micronesia, Palau is home to both crab-eating macaques and saltwater crocodiles. Palauans take pride in their beautiful and unique landscape and believe that a healthy environment is essential for a healthy, thriving community.

Sitting just 7 degrees north of the equator in Western Micronesia, the Republic of Palau is comprised of over 340 individual islands—only 12 of which are permanently inhabited—stretching 700 miles on a northeast to southwest axis. The total landmass is only 188 square miles, which is roughly equivalent to the island of Guam or 2.5 times the size of Washington D.C. The islands of Koror and Babeldoab are connected via roadways and bridges, while the island-states of Peleliu, Angaur, and Kayangel are accessible by boat or plane (Peleliu and Angaur only). A small group of islands 200-380 miles southwest of the main islands of Palau make up the states of Sonsoral and Hatohobei and are only accessible by larger ships.



Source: [www.nationalgeographic.com](http://www.nationalgeographic.com), 2013



# Introduction

**Figure 1. Regional and local maps of the Republic of Palau**



Source: <http://chindits.files.wordpress.com/2011/06/palau-map.jpg>

## History

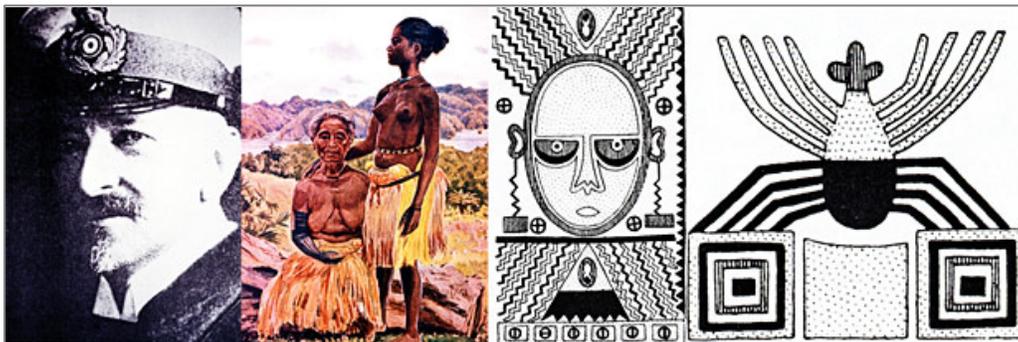
Carbon dating of artifacts from the oldest known villages in the islands reveals that people have inhabited Palau as early as 1000 B.C. It is still unclear exactly where these distant relatives came from, but several theories suggest modern day Philippines, Indonesia, Papua New Guinea or one of the other neighboring island bodies. The first believed foreign contact with the islands was in 1783 when the



# Introduction

English vessel *Antelope* shipwrecked on the reef. One hundred years later in 1885, Spain began to govern the islands, followed by Germany in 1899, and Japan in 1919. In 1922, Koror became the administrative center for all Japanese possessions in the South Pacific.

Following Japan's defeat in World War 2, Palau, along with the rest of the Caroline Islands, became United Nations Trust Territories under United States administration. On July 9<sup>th</sup>, 1980, Palau ratified its constitution and elected their first president in 1981. In 1986, A Compact of Free Association with the U.S. was approved, but not ratified until 1993. Palauans officially celebrate their independence on October 1, 1994 when the Compact went into effect. Under the Compact, the U.S. provides defense, funding grants, and access to U.S. social services for citizens on Palau.



Source: [www.etpisonmuseum.com/kramer](http://www.etpisonmuseum.com/kramer), 2013

## Traditional culture

With lingering evidence of Eastern and Western history and influence, Palauans still strongly identify with their own traditional culture. Several of the traditional ceremonies, such as the *omersuch* first-birth ceremony and the *kemeldiil* funeral services are widely practiced and the codes and beliefs adopted by their forefathers are still revered today. Before the introduction of Christianity by the Spanish, Palauans practiced an ancient religion with strong ties to their local plants, animals, and surrounding environment. Even today, Christian beliefs and indigenous practices coexist; *Modekngie* religion is a hybrid of ancient Palauan customs and Christianity.



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Palauan culture centers on the people's connection with the sea and land. Men developed a close relationship with the waters of Palau, becoming versant in the currents and the phases of the moon and the behavior of the fish they caught. Women generally stayed along the shallow reefs surrounding the islands and worked in the family's taro patch. Traditionally, taro was the most important, the most prominent, and the most revered food and crop in Palau. Taro was required in all customs and featured prominently in Palau's legends, stories, songs, chants, and proverbs. One proverb states: *A mesei a delal a telid* or "The taro patch is the mother of our life".



Source: <http://www.nationalgeographic.com>, 2013

## Modern Palau

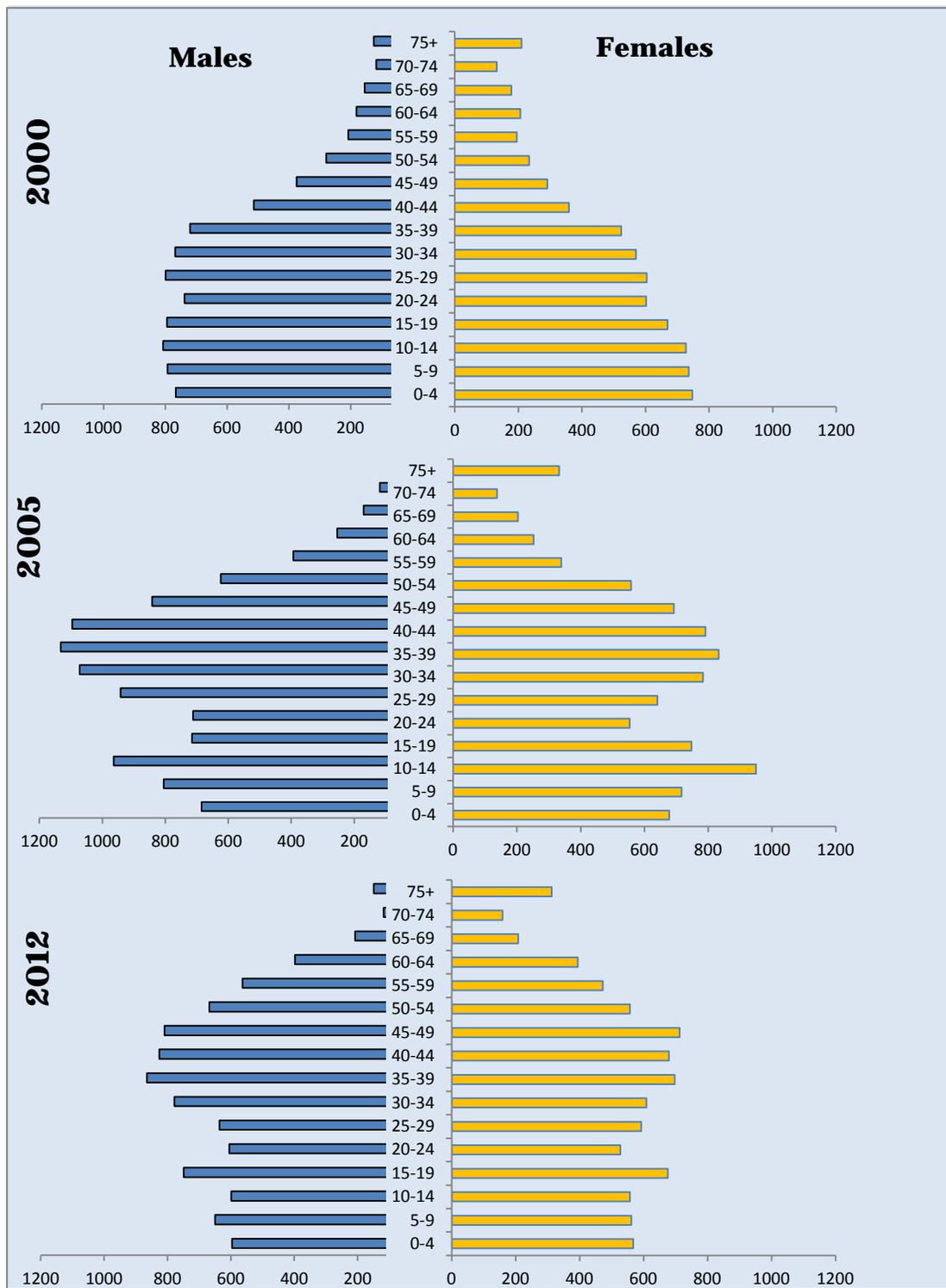
According to information from the Palau Mini Census 2012, there are 17,501 people who reside in Palau. This projection is slightly lower (12%) than the 2005 census estimate of 19,907. Today, Palau's demographic profile is characterized by a steady fertility rate (see Maternal & Child Health), a growing disparity in the female-male life expectancy (see Mortality), and a modest increase in mortality.

Overall, the population of Palau appears "stable" or "stationary", typical of countries with low fertility and low mortality rates, with minimal growth forecasted for the upcoming decades. This stable population in actuality is a dynamic influx of foreign workers migrating to Palau to fill positions left by emigrating young Palauans that are seeking educational, career, and military opportunities abroad.



# Introduction

**Figure 2. Palau population pyramid; 2000, 2005, and 2012**



Source: Ministry of Finance, 2012



# Introduction

Native Palauans are a majority 73% of the population. The largest ex-patriot population in Palau is Filipino (2,795 persons or 16%), followed by Americans (1.6%), Japanese (1.4%), Chinese (1.1%), Taiwanese (1.1%), and Bangladeshi (0.9%). Both Palauan and English are official languages in Palau with 70% literacy in both languages.

The economic and population capital of Palau is Koror (State), home to 66.7% of Palau's residents. Koror is also the location of Palau's only hospital (Belau National Hospital), the Central Community Health Center (Central CHC), and three private medical clinic (and one dental clinic). The neighboring state of Airai, with 14.5% of the population, is also home to Airai CHC, as well as, a small U.S. military medical clinic at Camp Katuu, which provides a free community clinic.

**Table 1. Population by state, island, and medical facilities, 2012**

State	Population (n=17,501)	% Total	Island(s) (% population)	Medical facilities
<b>Koror</b>	11,665	66.7	Koror, Ngerekebesang, Malakal (66.7)	Belau National Hospital; Central CHC; 3 private medical clinics; one private dental clinic
<b>Aimeliik</b>	281	1.6	Babeldoab (29.3)	Eastern CHC (Melekeok), North CHC (Ngarchelong), West CHC (Ngaremlengui), CHC (Airai), Camp Katuu medical clinic (Airai)
<b>Airai</b>	2,537	14.5		
<b>Melekeok</b>	299	1.7		
<b>Ngaraard</b>	453	2.6		
<b>Ngardmau</b>	195	1.1		
<b>Ngaremlengui</b>	309	1.8		
<b>Ngatpang</b>	257	1.5		
<b>Nchesar</b>	287	1.6		
<b>Ngerchelong</b>	281	1.6		
<b>Ngiwal</b>	226	1.3		
<b>Angaur</b>	130	0.7	Angaur (0.7)	Satellite dispensary
<b>Kayangel</b>	76	0.4	Kayangel atoll (0.4)	Satellite dispensary
<b>Peleliu</b>	489	2.8	Peleliu (2.8)	South Community Health Center
<b>Southwest Islands</b>	16	0.1	Sonsorol, Pulo Anna, Merir, Tobi Island (0.1)	Satellite dispensary (Tobi, Sonsorol)

Source: Ministry of Finance, 2013



# Introduction

## Government

While Koror remains the commercial capital of Palau, in 2006, the political capitol of Palau was moved to Ngerulmud in the state of Melekeok, located on the Eastern Coast of Babeldaob.



Source: [www.wikimapia.org/1820001/New-Capitol-Building-for-the-Republic-of-Palau#/photo/230004](http://www.wikimapia.org/1820001/New-Capitol-Building-for-the-Republic-of-Palau#/photo/230004), 2013

The national governmental structure of Palau is patterned on the American democratic model with executive, legislative and judiciary branches. The head of the government is the president, who appoints a cabinet. There are sixteen states, which form a second tier of government. Additionally, there is a body of traditional leaders, collectively known as the Council of Chiefs, that are made up of Paramount Chiefs from each of the states. These chiefs are responsible for advising the president on issues and matters of traditional laws and customs as they relate to the national constitution and laws.

## Economy

While the World Bank currently classifies Palau as “upper middle income,” according to a 2003 Bank of Hawai'i Economic Report, Palau's economic development level can best be described as that of a “hybrid economy with attributes of both developed and developing economies.” Following the 2008-09 global economic downturn, Palau's economy has recovered strongly driven by a 25% increase in tours arrivals to Palau. The nation largely depends on tourism and foreign aid for its livelihood with approximately 50% of gross domestic product (GDP) attributed to tourism receipts and an additional 25% to grants, especially those coming from the Compact Agreement with the U.S. The International



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Monetary Fund (IMF) predicts that Palau's economy will likely continue to grow in the short term with the support of new scheduled flights (from Asia) and new hotel construction.

Palau's economy remains particularly vulnerable to external pressures. The IMF warns that if a severe downturn were to happen in Asia, Palau's tourism sector and subsequently the entire economy would take a big hit. Additionally, with Palau's Compact grants set to expire in 10 years (FY 2024), the government needs to adjust expenditures and seek additional funding opportunities especially to support the half of Palau's domestic budget which is spent on wages and salaries for Palau's large public sector (See Table 2). Currently, Palau's tax revenue only accounts for 14.5% of GDP, among the lowest in the Pacific.

## Employment

Over the past 15 years, employment has nearly doubled for both men and women, however, women only account for approximately 40% of the workforce. This is likely due to a higher proportion of foreign male workers, coming to Palau to fill labor positions. These foreign workers also have a lower minimum wage than native Palauans, likely contributing to higher unemployment among Palauans. However, unemployment in Palau remains low.

**Table 2. Labor market indicators, 1990-2005**

Labor Market Indicators	1990	1995	2000	2005
<b>Total Employed</b>	<b>5,601</b>	<b>7,780</b>	<b>9,383</b>	<b>9,777</b>
Males	3,544	4,735	5,827	5,982
Females	2,057	3,045	3,556	3,795
Urban	-	-	8,170	7,883
Rural	-	-	1,213	1,894
Private	3,848	5,098	6,336	6,398
Public	2,115	2,661	2,745	3,388
<b>Total Unemployed</b>	<b>471</b>	<b>588</b>	<b>224</b>	<b>426</b>
Males	289	321	121	232
Females	182	267	103	194
<b>Unemployment rate, Urban</b>	-	-	2.0%	3.5%
<b>Unemployment rate, Rural</b>	-	-	7.0%	7.0%

Source: Ministry of Finance, Republic of Palau, 2005



# Introduction

## Socioeconomics

The 2006 Household Income & Expenditures Survey estimated the Basic Needs Poverty Line (BNPL) for Palau to be US \$244.67 per household per week. With this index, it was estimated that approximately 24.9% of the nation was living at or below the BNPL with a slightly higher proportion of rural-dwellers living in poverty than urban-dwellers. Subsistence living, defined as producing goods for one's own family's use and needs (e.g. growing or gathering food; fishing; cutting copra for home use; raising livestock; making handicrafts for home use), is still commonly practiced especially in the rural areas of Palau and not counted as 'Employed'.

The highest proportions of poor households were Kayangel, Angaur, and West Babeldoab. For Kayangel and Angaur, their remoteness from Koror is likely a major factor in their relative level of disadvantage. For those in West Babeldoab the situation is more complex; it appears that there is considerably more movement to and from Koror with many families living in the urban center during the week and returning to their villages on the weekends. According to the HIES report, there is anecdotal evidence to suggest that many working couples may leave children in West Babeldoab villages to be looked after by grandparents and that unrecorded gifts of food and other essentials mitigate the low expenditure recorded by these households in the survey. This hypothesis is supported by the fact that 28.2% of rural households are headed by persons over 60 years compared to only 20.9% of households in the urban center.

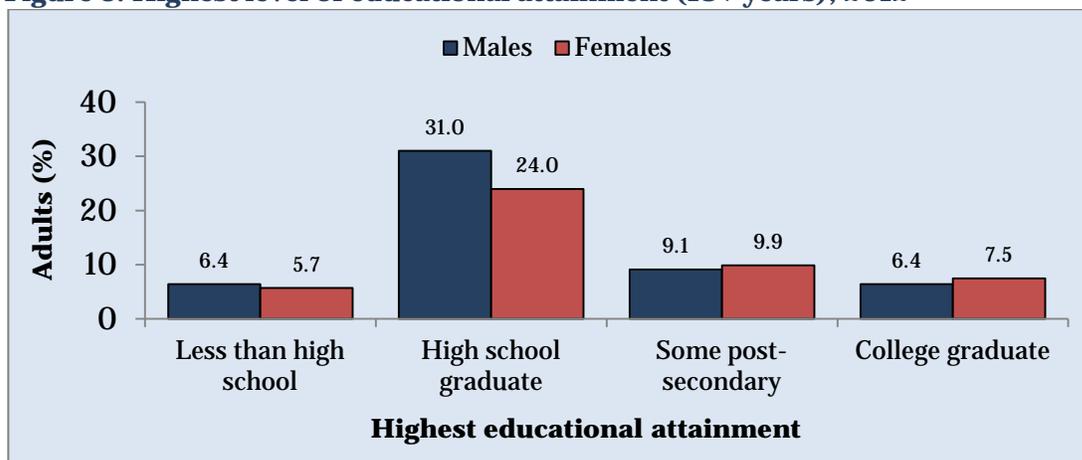
## Education

In addition to Palau's 20 elementary and 6 high schools, Palau Community College offers tertiary education to local students. Approximately 88% of residents over the age of 18 years report having a high school diploma or GED equivalent.



# Introduction

**Figure 3. Highest level of educational attainment (18+ years), 2012**



Source: Ministry of Finance, 2012

## Healthcare Services

Healthcare services in Palau are provided primarily through the government's Ministry of Health. The Ministry provides comprehensive primary, secondary and limited tertiary services, including both preventive and curative care, through the 80-bed Belau National Hospital and Community Health Centers (CHC) including six "super" dispensaries and four satellite sites (Table 1).

Palau's Healthcare Fund program was established in 2010 with the enactment of the National Healthcare Financing Act. It consists of two components, individual Medical Savings Accounts (MSA) and a pooled universal social health insurance fund commonly known as National Health Insurance (NHI). These components are funded through mandatory contributions on earned income and collected in the same manner as, for example, contributions to the Social Security Trust Fund. MSA can be used at the outpatient department of Belau National Hospital and CHC dispensaries, as well as several private clinics. NHI was designed to complement MSA since MSA funds are usually insufficient to cover the costs of catastrophic illnesses or prolonged injuries and can be used on-island and for some off-island referrals.

Medical care in Palau is affected by two primary issues: (1) a small population spread across multiple islands and (2) limited technical and human resource capacity. Many types of specialty care are not available on island either due to these reasons. Therefore access to tertiary or specialty care frequently necessitates off-island travel to the Philippines, Taiwan, or Hawai'i for diagnosis and treatments.



# Methodology

## Purpose

The Republic of Palau Ministry of Health strives to attain a healthful environment, promote health and social welfare, protect family health and safety, and provide health care services throughout the Republic. In order to realize this vision, it is essential to understand the current state of health of the community including primary health outcomes, behavioral, and environmental risk factors, and particular populations with special health-care needs.

Ten years ago, MOH took the first steps to capture a comprehensive overview of the community's health via the *2003 Community Health Assessment*, a nationwide survey. As the Bureau of Public Health works towards national accreditation through the U.S.-based Public Health Accreditation Board, the need has arisen to generate an updated community health assessment that not only considers current health indicators but aims to identify health trends within the population. Whereas the 2003 CHA used primary survey methodology, this newer health assessment synthesizes existing data from agencies around the country to describe health indicators as accurately as possible. In order to distinguish the two methodologies, this new assessment has been named the *2013 National Health Profile*.

## Procedure

In August 2013, the program managers of the Bureau of Public Health and senior management met to discuss potential indicators for the new health assessment. This list was compared to available datasets (Table 4) and examined for accuracy and reliability. Standardized surveillance systems—both national and international—were considered as the most reliable source for health indicators. Also preferred were on-going periodic surveys which can be used to update future health assessments. When possible and appropriate, data was stratified by age and gender.

Health indicators were compiled and presented to community members in a variety of settings. During these presentations, community members were asked to identify health assets in the community and prioritize health issues for the Republic. These oral presentations were complimented by a tri-fold brochure with highlights from the National Health Profile and health resources from partnering public health programs and non-governmental organizations (e.g. *Ulekerreuil a Klengar* (UAK), Palauan noncommunicable disease non-profit). Input from community stakeholders was collected during in-person meetings as well as through surveys collected at community forums, July-August 2014, which included the Ministry of Education's annual convention and bi-weekly public night markets.



# Methodology

**Table 4. Data sources for 2013 National Health Profile**

<b>Data Source</b>	<b>Frequency</b>	<b>Data Type</b>
<b>Article IV Consultation (International Monetary Fund)</b>	2012	Economics
<b>Behavioral Risk Factor Surveillance Survey (BRFSS)</b>	2012	Adult Substance use Body weight Non-communicable diseases
<b>Mini-census (MOF)</b>	2012	Demographics
<b>Division of Environmental Health (MOH), Annual Progress Report</b>	2012	Environmental health indicators
<b>Household Income &amp; Expenditures Survey (MOF)</b>	2006	Socioeconomics
<b>Health Information System (HIS)</b>	Continuous	Mortality data
<b>Maternal and Child Health Services Title V Block Grant, State Narrative for Palau (MOH)</b>	2012	Maternal and Child Health
<b>School Health Survey (MOH)</b>	Annual	Body weight Oral health
<b>Reportable Disease Surveillance System (RDSS)</b>	Continuous	Communicable diseases
<b>Youth Risk Behavior Surveillance System (YRBS)</b>	Biannual	Youth substance use Dietary habits Body weight

## Limitations

The 2013 CHA strives to accurately describe the health of the people in Palau relying on existing reports and available datasets. It is these parameters which most greatly influenced the selected health indicators as the CHA began to evolve. The following indicators are not necessarily the top health priorities of Palauans, but those that we (the authors) have reliable access to.

Palau is still in the beginning stages of systematically collecting health data. The Youth Risk Behavior Survey (YRBS) is one of these systematic surveys which allow us to compare health indicators across time and make comparisons against other populations. Recently, Palau began participating in the Behavioral Risk Factor Survey (BRFSS; U.S. Centers for Disease Control) and STEPwise approach to surveillance (STEPS; World Health Organization).

Palau piloted the BRFSS in 2010 and began releasing data upon completion of the 2012 survey. This year—2013—Palau also completed its first STEPS survey. Both surveys take an important step towards identifying risk factors in the population and assessing the level of non-communicable diseases—a national



# Methodology

health priority in Palau. Preliminary results highlight discrepancies in survey methodology which yield two distinct results for particular indicators (e.g. diabetes prevalence). As time progresses, we hope to overcome these discrepancies and develop a sound survey tool appropriate for our population.

Additionally, STEPS survey collects important biological samples which can more precisely describe particular health indicators. When this survey was first piloted there were challenges in maintaining survey tools such as weight scales and expired test strips. These set-backs were triggered by Palau's tropical climate and unique transportation obstacles.

Lastly, Palau continues to streamline reporting within their own information systems such as the Ministry of Health's Health Information System (HIS) and Reportable Disease Surveillance System (RDSS). For instance, from 2006-2012 there were no reported cases of AIDS, cholera, filariasis, fish poisoning, or Hep A. However, in the 2012 Palau National Lymphatic Filariasis survey identified two cases of filarial antigenemia, but because they were identified during a survey and not in the clinical system, they were not recorded in RDSS.

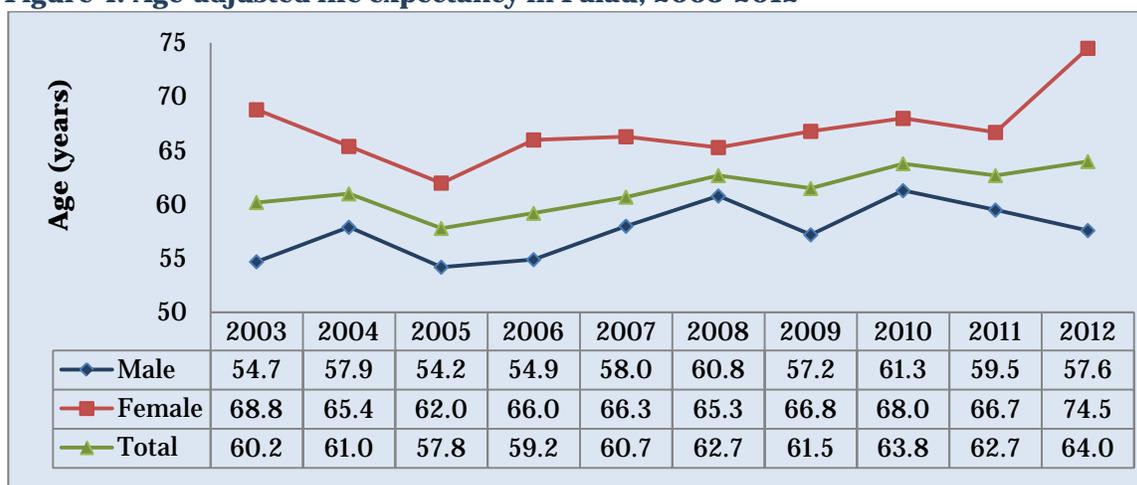


# Mortality

## Life Expectancy

There has been an increase in life expectancy in Palau over the past decade with an average life expectancy of 57.6 for men and 67.0 for women. The 2012 Palauan life expectancy was calculated to be 57.6 for men and 74.5 for women. In the U.S., the current life expectancies for men and women are 76.2 and 81.2, respectively, both substantially higher than Palau (CIA World Factbook). In such a small population, the life expectancy can fluctuate dramatically from year to year. Incidentally, the CIA World Factbook estimates the 2014 life-expectancy for Palau to be 69.43 years for men and 75.96 years for women.

**Figure 4. Age-adjusted life expectancy in Palau, 2003-2012**



Source: HIS, 2003-2011

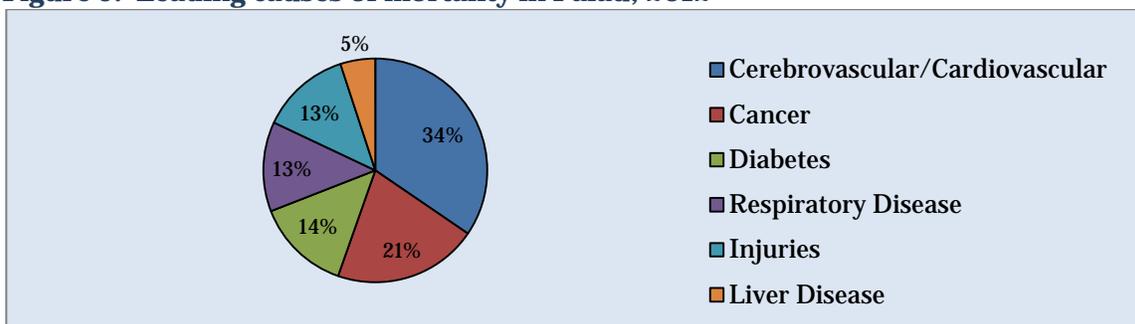
## Leading Causes of Death

There were a total of 162 deaths in Palau in 2012. The leading causes of death in Palau are related to non-communicable diseases and injuries (both intentional and unintentional). Cerebrovascular/cardiovascular deaths top the list at 29.6% of all deaths, followed by cancer (17.9%), injury (13.0%), diabetes (11.7%), and respiratory diseases (including pneumonia, influenza, and chronic obstructive pulmonary disease; 11.1%). This trend has remained consistent over the past 10 years.



# Mortality

**Figure 5. Leading causes of mortality in Palau, 2012**

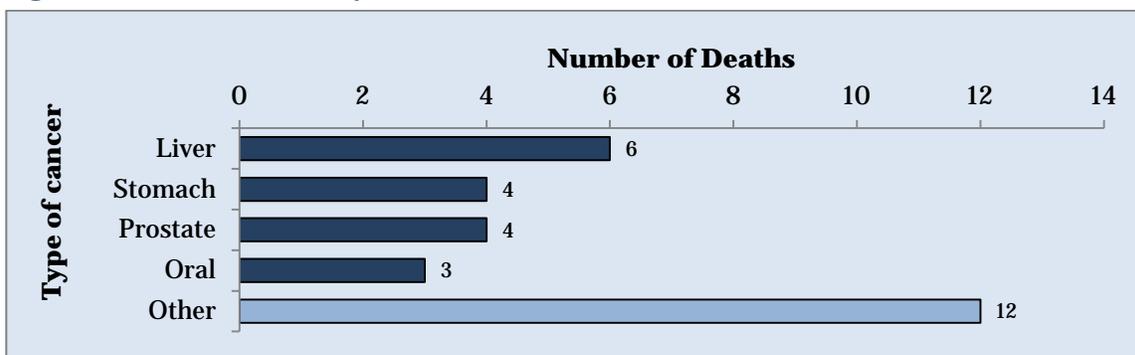


Source: HIS, 2012

## Cancer Mortality

In terms of cancer-related deaths, cancer of the liver had the highest mortality rate accounting for 20.6% of deaths. Lung cancer, which led cancer mortality in 2011 with 8 deaths, dropped down to only 2 deaths in 2012. Stomach and prostate cancer were leading causes of cancer mortality in 2012 with each representing 13.8% of cancer deaths. Other cancer-deaths in 2013 were attributed to: oral cancer (n=3), colon cancer (n=2), breast cancer (n=2), leukemia (n=2), lung cancer (n=2), pancreatic cancer (n=1), and brain cancer (n=1).

**Figure 6. Cancer mortality in Palau, 2012**



Source: HIS, 2012

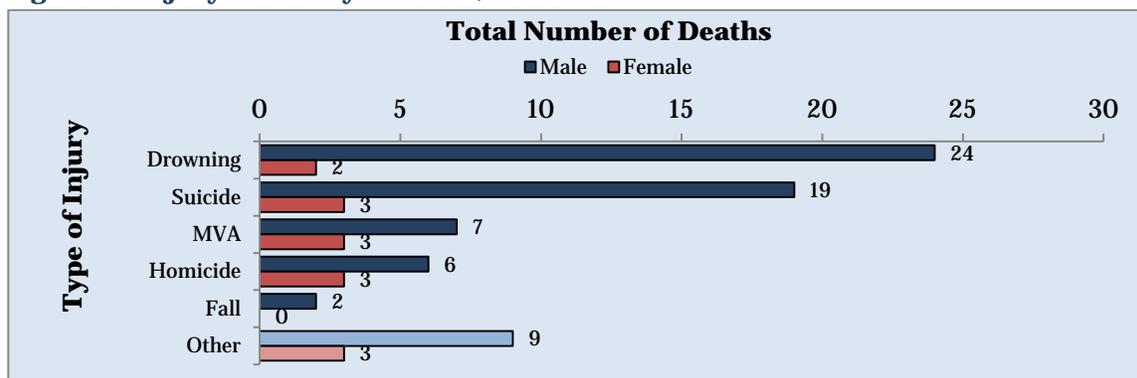


# Mortality

## Injuries

Injuries account for over 1 in 10 deaths in Palau. The leading causes of mortality from injuries from 2008-2012 were: Drowning (n=26), suicide (n=24), motor vehicle accidents (MVA; n=10), homicide (n=9), fall (n=2), and other (including poisoning and electrocution, n=12).

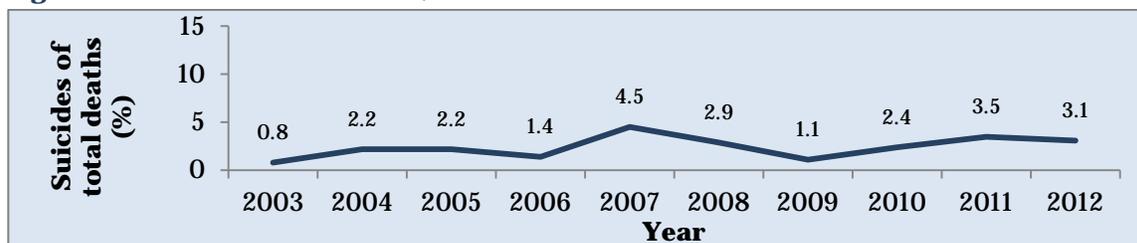
**Figure 7. Injury mortality in Palau, 2008-2012**



Source: HIS, 2008-2012

Males account for over 80% of all injury-related deaths in Palau. There is a notable gender disparity in both drowning deaths and suicides. Many drowning deaths are suspected to be alcohol-related; however, no data is available to examine this hypothesis. Over the past ten years, suicides in Palau have averaged 2.4% of all deaths. This is roughly equivalent to 21.7 suicides per 100,000 people, which is among one of the highest suicide rates in the world. Despite the fact that males account for over 90% of suicide deaths, females are more likely to report feelings depressed (Figure 22).

**Figure 8. Suicide rate in Palau, 2003-2012**



Source: HIS, 2003-2012



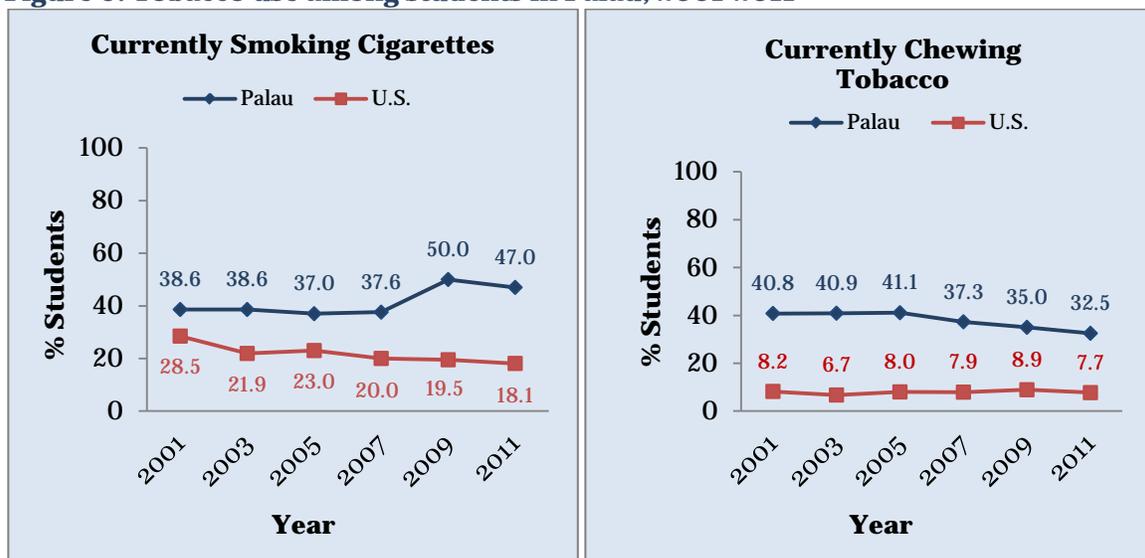
# Risk Factors

The MOH's Division of Behavioral Health is the primary provider of comprehensive behavioral health services in Palau. These services range from prevention to recovery oriented services for substance use and mental health.

## Tobacco Use

Among high school students, tobacco chewing—traditionally added to local areca or “betel” nut—is on the decline whereas it appears more students are beginning to smoke cigarettes. Both cigarette smoking and tobacco chewing are significantly higher among students in Palau compared to their U.S. counterparts (47.0% vs 18.1% and 32.5% vs 7.7%, respectively).

**Figure 9. Tobacco use among students in Palau, 2001-2011**



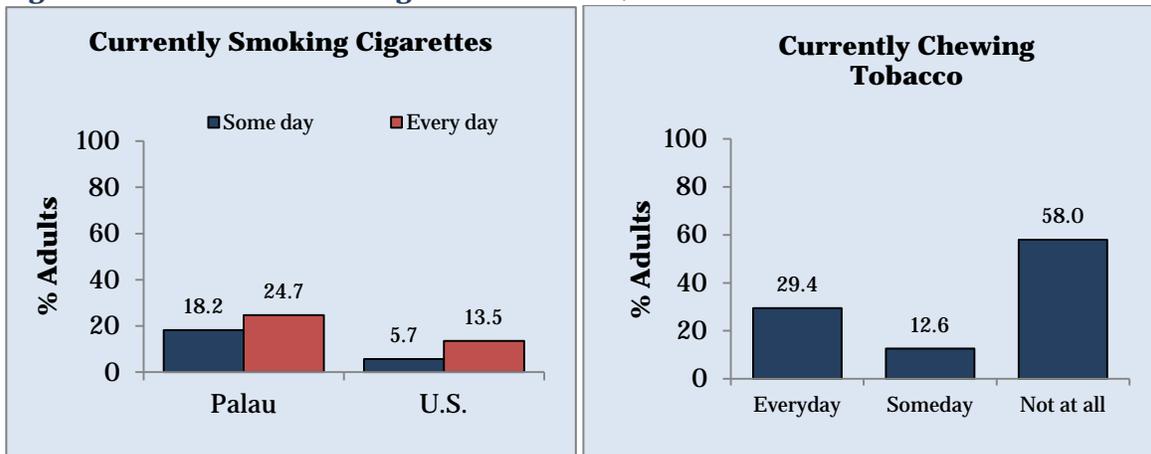
Source: YRBS, 2001-2011

Among adults, 9.7% report current cigarette smoking and 38.3% report current tobacco chewing.



# Risk Factors

**Figure 10. Tobacco use among adults in Palau, 2012**

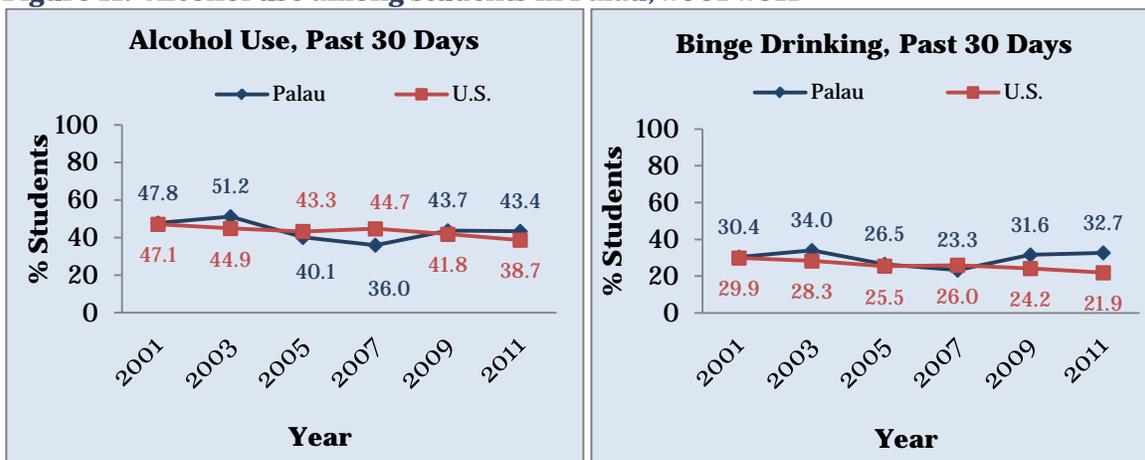


Source: BRFSS, 2012

## Alcohol Use

Current alcohol use and binge drinking among youth has remained fairly stable over the past decade in Palau. As of 2011, 43.4% of high school youth in Palau drink alcohol, and 32.7% report binge drinking (5 or more drinks on one occasion for males, 4 or more for females) in the past 30 days. Overall, youth binge drinking appears to be increasing among Palauan youth in recent years, whereas this trend is decreasing among American youth.

**Figure 11. Alcohol use among students in Palau, 2001-2011**



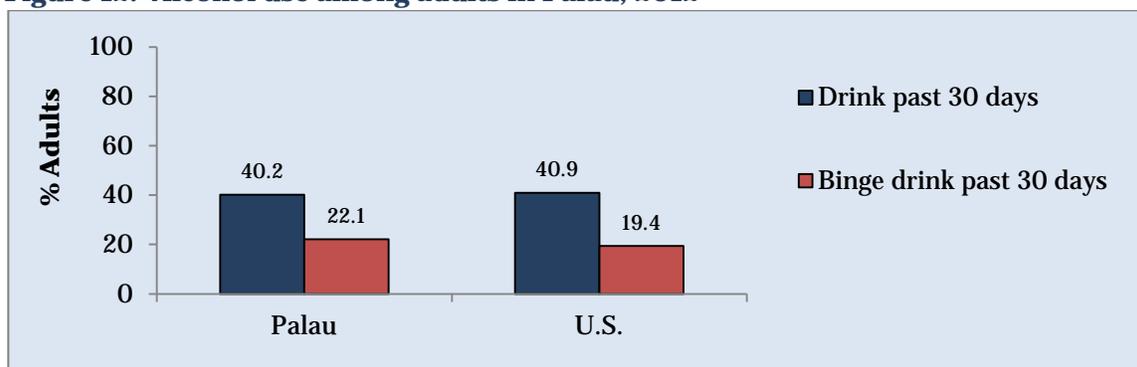
Source: YRBS, 2001-2011



## Risk Factors

The behaviors are slightly less prevalent in the adult population with only 40.2% and 22.1% of Palau adults reporting alcohol use and binge drinking, respectively, in the past 30 days. These rates are similar to those seen among adults in the general U.S. population, however, the 2012 estimates show that while fewer Palauans report having a drink in the past 30 days as compared to their U.S. counterparts, more Palauans also report binge drinking.

**Figure 12. Alcohol use among adults in Palau, 2012**



Source: BRFSS, 2012

### Other Drugs (Youth)

The three most commonly reported illicit drugs ever used by Palauan youth include marijuana, prescription drugs (e.g. demerol), and methamphetamines (meth). Both lifetime (ever used) and current rates of use for marijuana in Palauan youth are higher than those seen in Guam or U.S. and likely due to the fact that the plant grows on many of the islands. Although prescription drug *abuse* in Palau is lower than that seen in the U.S., both clinicians and families need to be vigilant and aware of the growing threat of this substance abuse in youth. Finally, meth, which may be imported from neighboring Asian nations, is over 2x more common in Palau with over 8% of students reported having ever used this drug.



# Risk Factors

**Table 4. Regional comparison of illicit drug use among students, 2011**

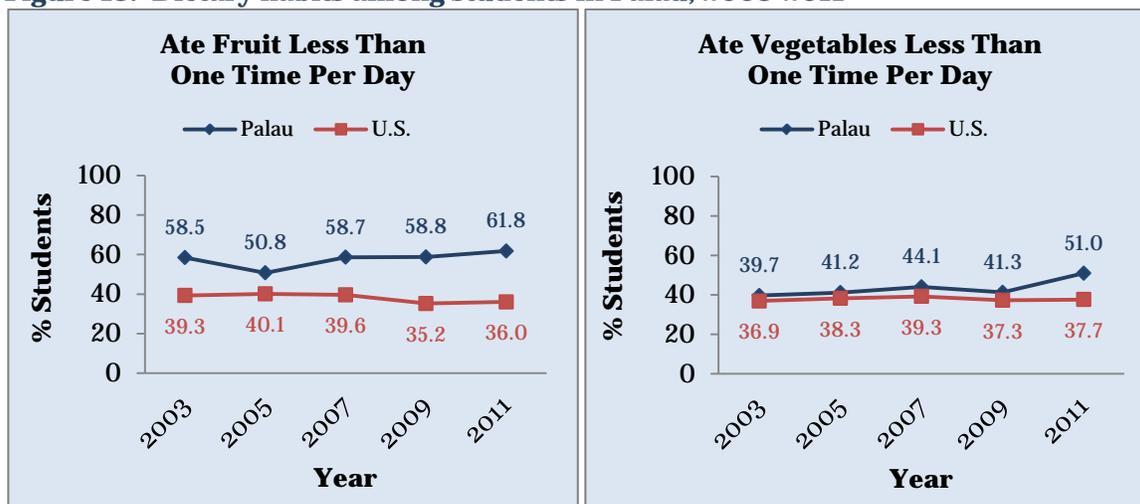
When asked if they've ever used the illicit drug listed below (% students answering yes):	Palau	Guam	U.S.
Marijuana	64.2	48.8	39.9
Prescription Drugs	10.5	-	20.7
Methamphetamines	8.5	3.2	3.8
Inhalants	8.4	8.5	11.4
Ecstasy	7.3	3.7	8.2
Cocaine	7.1	2.9	6.8
Steroids	6.6	3.4	3.6
Heroin	5.8	-	2.9

Source: YRBS, 2011

## Nutrition

The percent of high school youth in Palau who eat less than one serving of fruits and vegetables per day is well above the U.S. national average. Since 2003, the proportion of students eating less than one serving of fruit a day was 57.7% and appears to be increasing over the past several years. This proportion, however alarming, is similar to other USAPIs (e.g. Guam). Similarly, a slightly lower proportion of students are eating vegetables daily (10-year average, 43.5%), again much higher than students in the U.S., but on par with neighboring islands.

**Figure 13. Dietary habits among students in Palau, 2003-2011**



Source: YRBS, 2001-2011

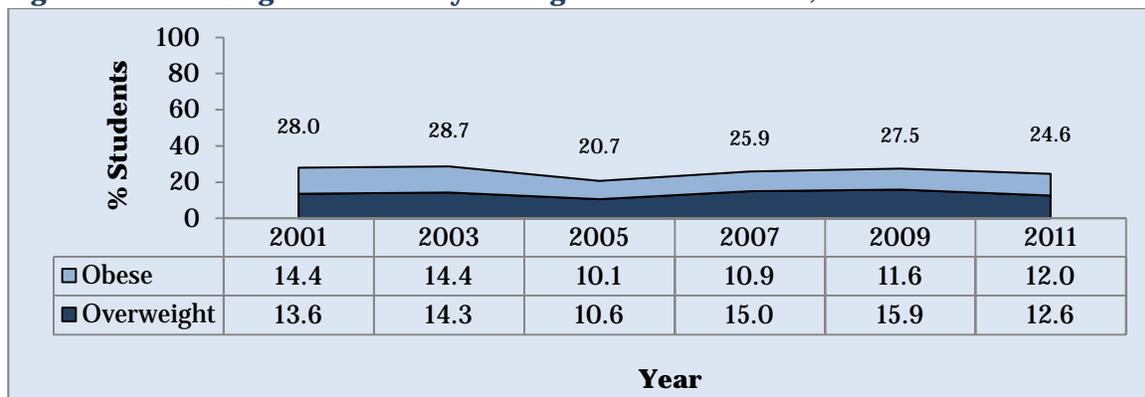


# Risk Factors

## Overweight/Obesity

Despite an increased awareness of the risk of being overweight/obese in recent years, according to the Youth Risk Behavior Surveillance System (YRBSS), the proportion of students self-reporting overweight and obesity has stayed fairly constant over the past decade at around one-quarter of students.

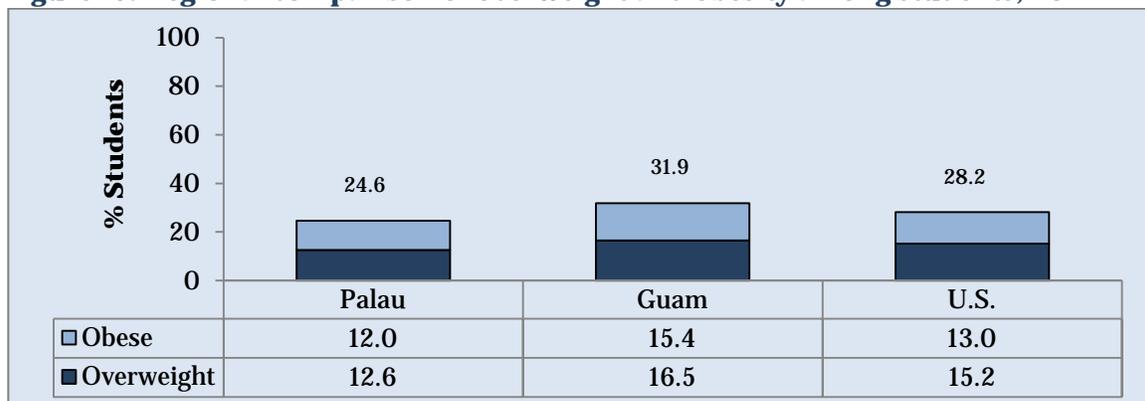
**Figure 14. Overweight and obesity among students in Palau, 2001-2011**



Source: YRBS, 2001-2011

According to YRBS, in 2011, 24.6% of high school youth self-report BMIs that are classified as overweight or obese. This rate is slightly lower than that of the U.S. or Guam.

**Figure 15. Regional comparison of overweight and obesity among students, 2011**



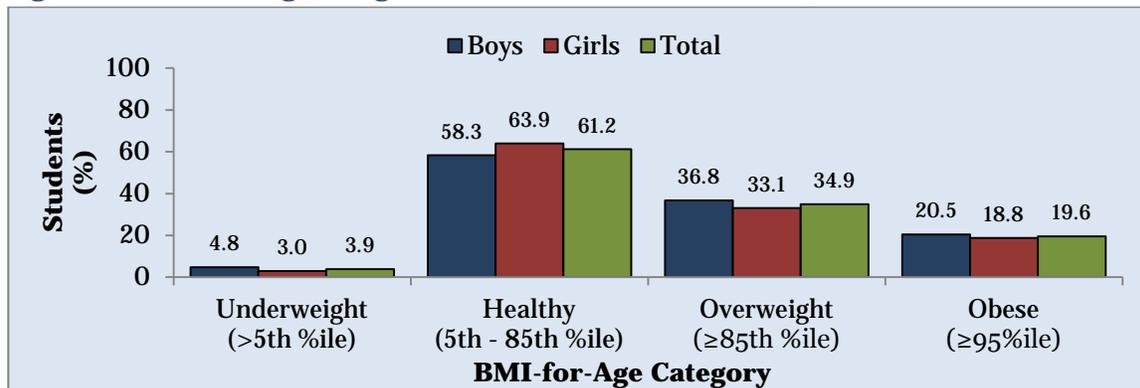
Source: YRBS, 2011



# Risk Factors

However, data collected during the annual school health surveys estimates the prevalence of overweight/obesity to be much higher. For instance, according to the school health survey, in 2012, 35% of students were overweight or obese (BMI-for-Age  $\geq 85^{\text{th}}$  percentile) compared to the 24.6% reported by the YRBS in 2011.

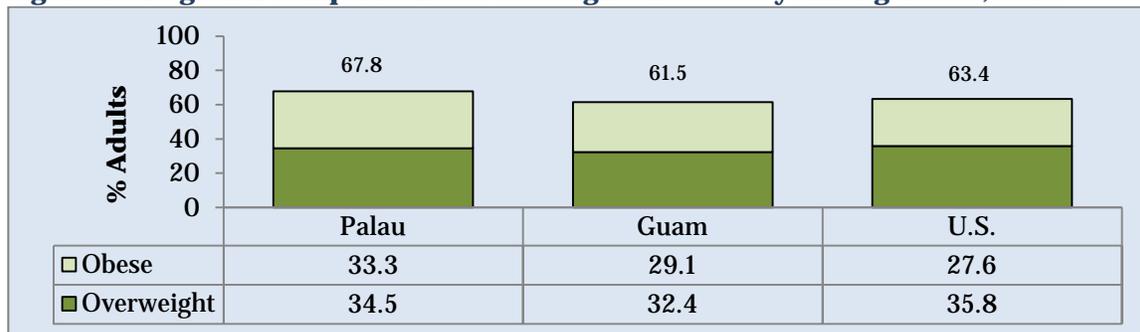
**Figure 16. BMI-for-age categorization for students in Palau, 2012**



Source: School Health Survey, 2012

Still, a much higher proportion of Palauan adults self-report BMIs that are overweight or obese. Currently, two out of three adults in Palau self-report BMIs that are overweight or obese which is higher than the rates of overweight/obesity both in Guam and the U.S. It should be noted that for both youth and adults, height and weight were self-reported. The trend of higher adult rates but lower youth rates should be further explored to investigate ages of onset as well as risk and protective factors.

**Figure 17. Regional comparison of overweight and obesity among adults, 2012**



Source: BRFSS, 2012



# Noncommunicable Diseases

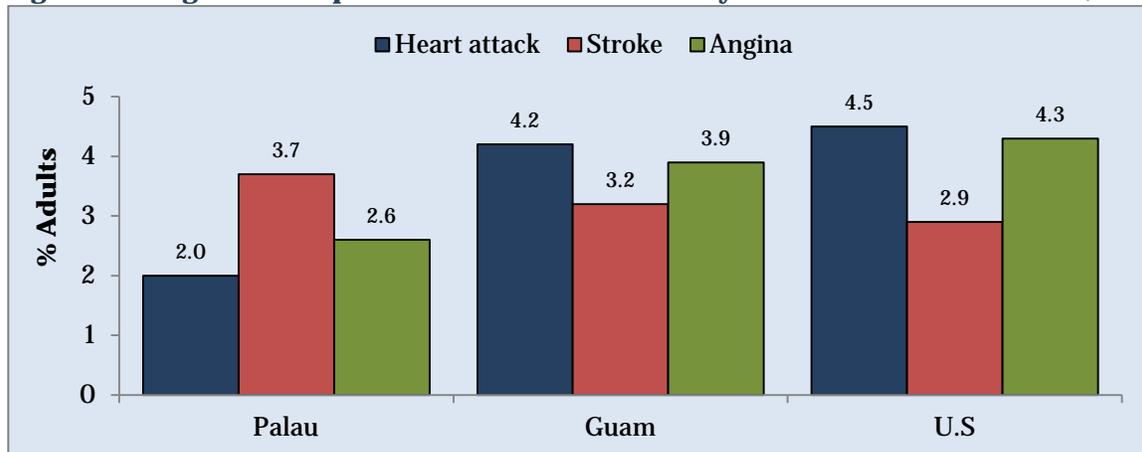
Since being declared a regional emergency by former Palau Minister of Health, Dr. Stevenson Kuartei, in 2010, noncommunicable diseases (NCDs) have been *the* health priority in Palau. Under the Division of Primary and Preventive Health Services at the Ministry of Health, the NCD Unit partners with community and regional organizations to promote and support healthy lifestyle initiatives to reduce the risk of these diseases.

Working collaboratively, the NCD Unit works to raise awareness and education for NCDs and their risk factors; promotes, supports, and/or coordinates the development implementation, monitoring, and evaluation of health promotion efforts; provides primary care services including screenings, referrals, and follow-up diagnostics.

## Cardiovascular Disease

While accounting for 34% of total deaths in 2012, the prevalence of cardiovascular disease (CVD) remains relatively low in the adult population. In 2012, only 2.0% of adults reported having had a heart attack (ever) which is approximately half the rate of Guam and U.S. populations. Angina was also relatively low at 2.6%. Stroke prevalence, however, exceeded Guam and U.S. rates at 3.7%. Taken together, CVD morbidity in Palau is approximately 25-30% lower than those seen in Guam and the U.S.

**Figure 18. Regional comparison of adults with history of cardiovascular disease, 2012**



Source: BRFSS, 2012

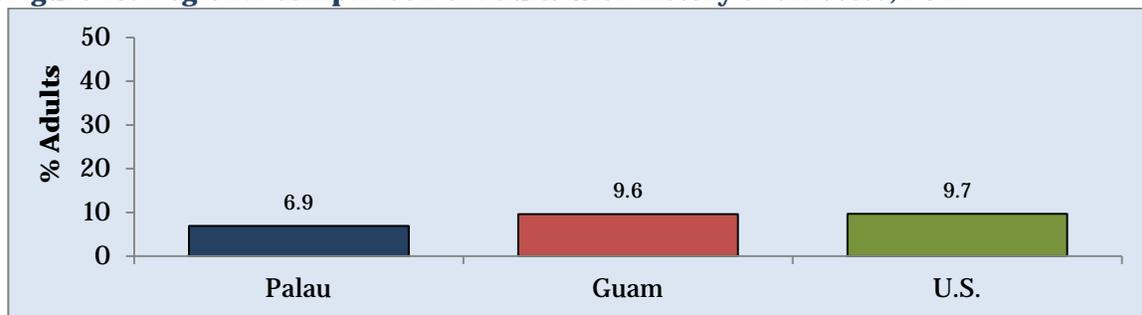


# Noncommunicable Diseases

## Diabetes

Diabetes causes cardiovascular disease and other health complications, including kidney disease, blindness, and limb amputation. In 2012, the estimated prevalence of diabetes in adults in Palau was 6.9% with an additional 2.6% pre-diabetic. This is around 30% lower than the U.S. national prevalence of 9.7% and Guam at 9.6% and do not match the higher prevalence of obesity/overweight seen in the Republic (see Figure 14).

**Figure 19. Regional comparison of adults with history of diabetes, 2012**

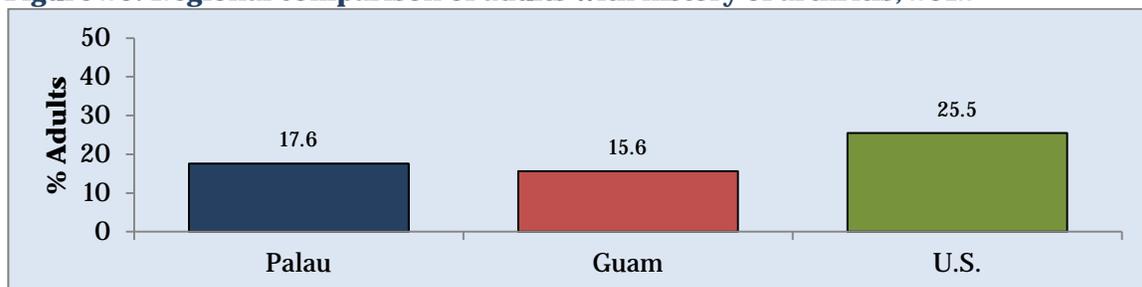


Source: BRFSS, 2012

## Arthritis

Arthritis is a form of joint disorder, which includes osteoarthritis, rheumatoid arthritis, and gout, among others. In 2012, nearly 1 in 5 Palauans over the age of 25 reported having been diagnosed with a joint disorder. This prevalence is slightly lower than the U.S. general population but higher than that of Guam.

**Figure 20. Regional comparison of adults with history of arthritis, 2012**



Source: BRFSS, 2012



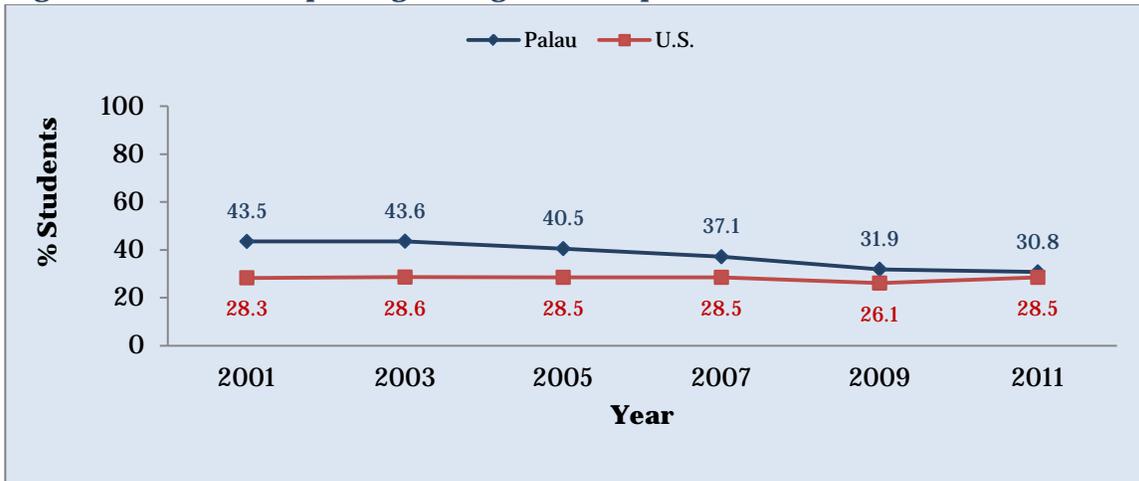
# Noncommunicable Diseases

## Depression

Depression encompasses a spectrum of disorders which are characterized by a combination of symptoms that interfere with a person's ability to work, sleep, study, eat and enjoy once-pleasurable activities, which last for 2 weeks or longer (National Institute of Mental Health). Depression is caused by a combination of genetic, biological, environmental, and psychological factors.

Results from YRBS indicate that students in Palau are more likely to feel sad or hopeless than their American counterparts, however, this gap has been steadily declining over the past 10 years. In 2011, 30.8% of Palauan youth reported feelings of sadness or hopelessness lasting for 2+ weeks compared to only 28.5% of youth in the U.S. This is down from a high of 43.6% reported back in 2003 which was then 1.5 times higher than the general U.S population.

**Figure 21. Students reporting feeling sad or hopeless, 2001-2011**



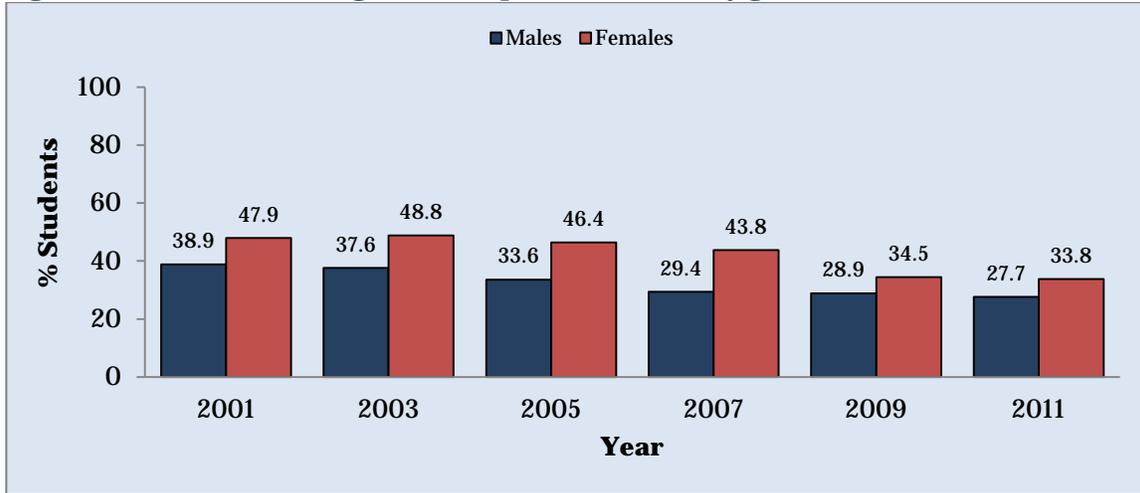
Source: YRBS, 2001-2011

There is a large gender disparity on feeling sad or hopeless in Palau. Again, this disparity has been decreasing over time, yet a higher proportion of females consistently report these feelings. In 2011, 33.8% of females reported feeling depressed compared to 27.7% of males.



# Noncommunicable Diseases

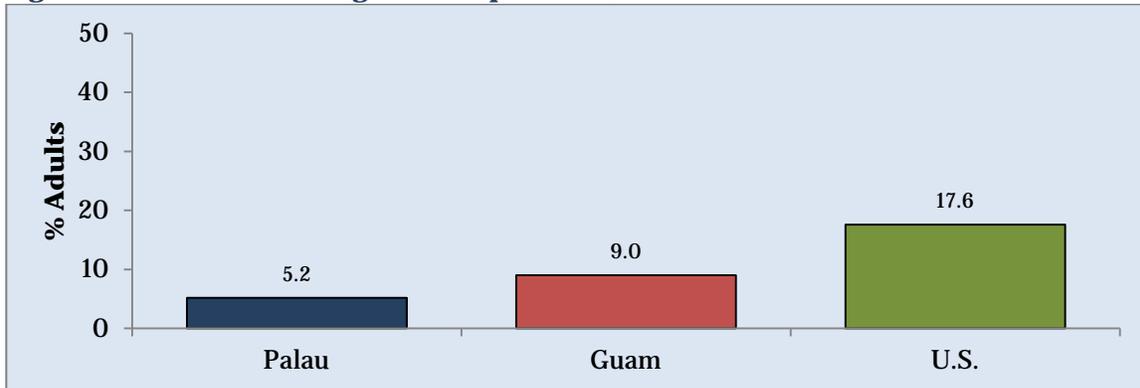
**Figure 22. Students feeling sad or hopeless in Palau by gender, 2001-2011**



Source: YRBS, 2001-2011

Although students in Palau are more likely to report feelings of depression compared to their U.S. counterparts, diagnosed depression in Palauan adults is 70% lower than the U.S. with only 5.2% of Palauans reported clinical diagnoses. This prevalence is also 40% lower than the 9.0% of Guamanians reporting diagnosed depression.

**Figure 23. Adults with diagnosed depression, 2012**



Source: BRFSS, 2012



# Communicable Diseases

The Communicable Disease Unit (CDU) and Epidemiology Unit at the Ministry of Health work collaboratively to identify and control communicable (“infectious”) diseases in Palau. Palau maintains two systems for surveillance of infectious diseases, the Reportable Disease Surveillance System (RDSS) and a Syndromic Surveillance System. All providers in Palau are required by law to report each incidence of a newly diagnosed Reportable Disease regardless of whether it is suspected, probably or confirmed. The CDU investigates and confirms cases which are then tracked in RDSS. The Emergency Room and Out Patient Department at Belau National Hospital are the sentinel sites for surveillance of identified syndromes of public health interest (diarrhea, influenza-like illness, acute fever and rash, prolonged fever and conjunctivitis). These two systems enable the Bureau of Public Health to prepare for, detect, and respond to public health emergencies and reported to the public and to appropriate regional partners (e.g. Pacific Public Health Surveillance Network and WHO Event Information Site).

**Table 5. Conditions requiring immediate response and international reporting**

SINGLE CASES OF ANY OF THE FOLLOWING UNUSUAL AND UNEXPECTED DISEASES	
• Smallpox	• Poliomyelitis due to wild-type poliovirus
• Human influenza caused by a new subtype	• Severe acute respiratory syndrome (SARS)
EVENTS WITH SPECIAL NATIONAL OR REGIONAL CONCERN	
• Cholera	• Pertussis
• Malaria	• Rubella
• Measles	• Typhoid
• Meningococcal disease	• Dengue
• Other diseases that are very unusual, e.g., Rift Valley Fever, Pneumonic plague, Yellow fever, Viral hemorrhagic fevers, West Nile fever, etc.	

Note: This is not an exhaustive list of the reportable diseases in Palau.

The CDU is tasked with primary, secondary, and tertiary care activities with the responsibility of prevention, control, and elimination of communicable diseases and infections. Primary preventive services include immunization for children and adults and community education and outreach (including individual and group screenings). Secondary preventive services include treatments and contact investigations for all suspects and confirmed infectious disease. Tertiary Care

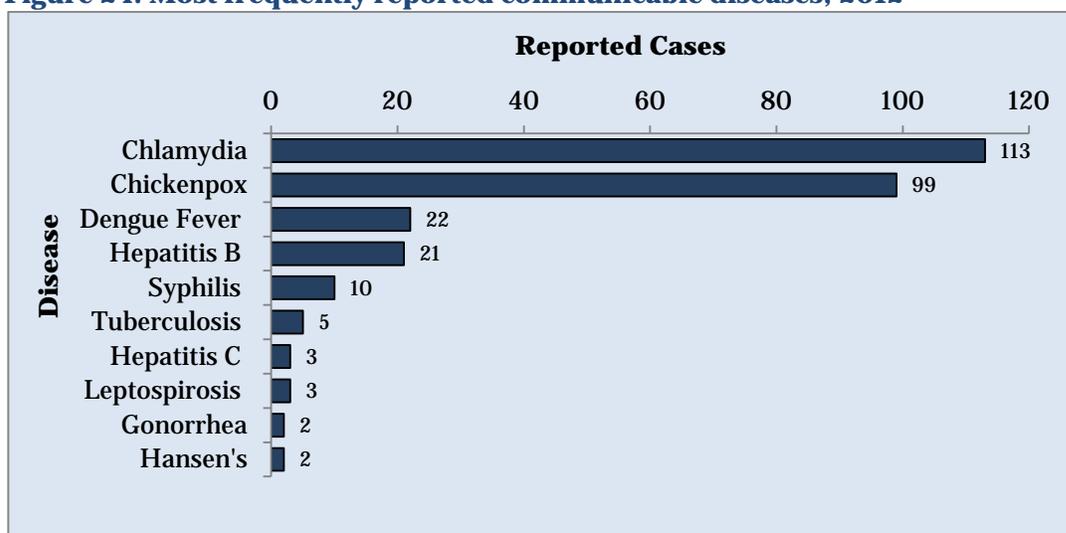


# Communicable Diseases

includes support for individuals living with infectious disease especially those with debilitating and stigmatizing consequences.

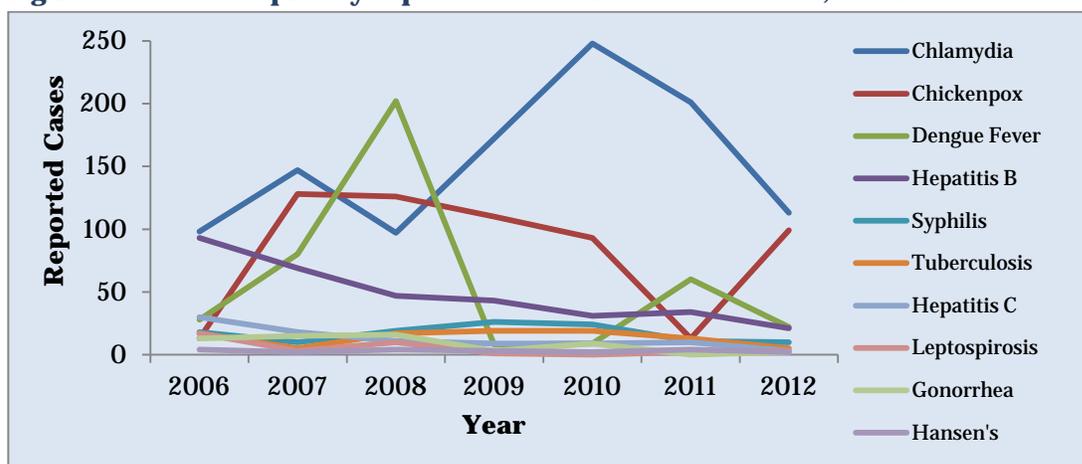
The leading infectious diseases in Palau include sexually transmitted infections (e.g. Chlamydia, syphilis, and gonorrhea) and chickenpox, which accounted for two-thirds of all reportable diseases in 2012. Palau also continues to report cases of several “neglected” tropical diseases, such as Dengue Fever and leprosy.

**Figure 24. Most frequently reported communicable diseases, 2012**



Source: RDSS, 2006-2012

**Figure 25. Most frequently reported communicable diseases, 2006-2012**



Source: RDSS, 2006-2012

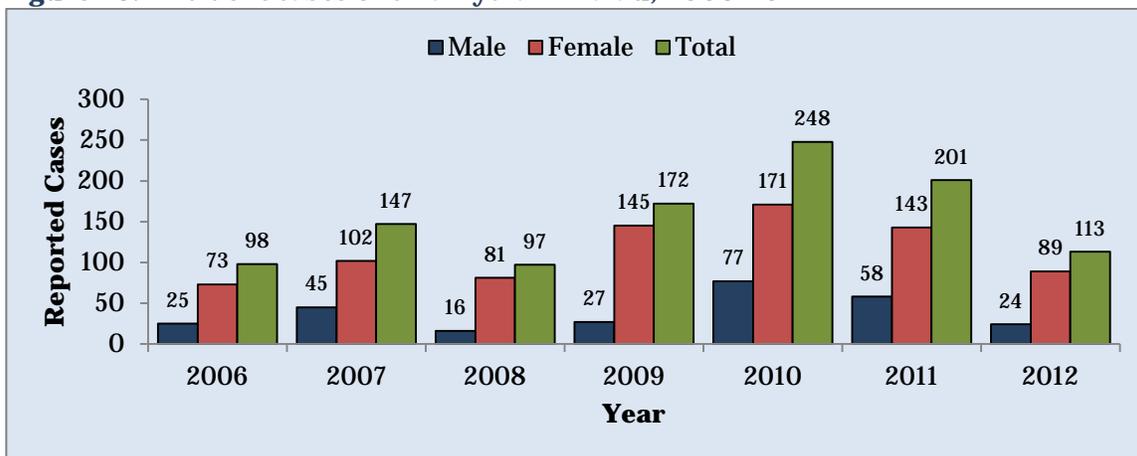


# Communicable Diseases

## Chlamydia

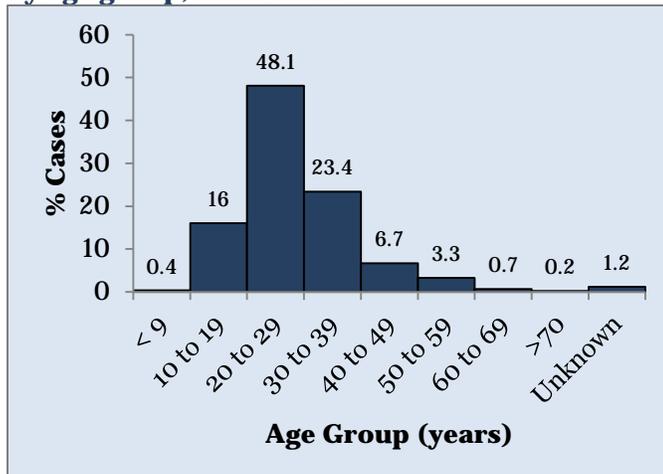
Chlamydia is the most common sexually transmitted infection in Palau. Since 2006, 78% of these cases were recorded as Palauan and another 13% as Filipino, 3% Other Micronesians, and 3% Other Asian. Females consistently account for approximately 75% of all reported cases, which may be due to higher screening among women during routine exams.

**Figure 26. Incident cases of chlamydia in Palau, 2006-2012**



Source: RDSS, 2006-2012

**Figure 27. Incident cases of chlamydia in Palau by age group, 2006-2012**



Source: RDSS, 2006-2012

In 2011, there were 201 reported cases of chlamydia with an incidence of approximately 1149 cases per 100,000 people. This estimate is 2.5 times the incidence rate of the general U.S. population (457.6 per 100,000 people) and two times higher than that reported by Guam (592.2 per 100,000 people; CDC).

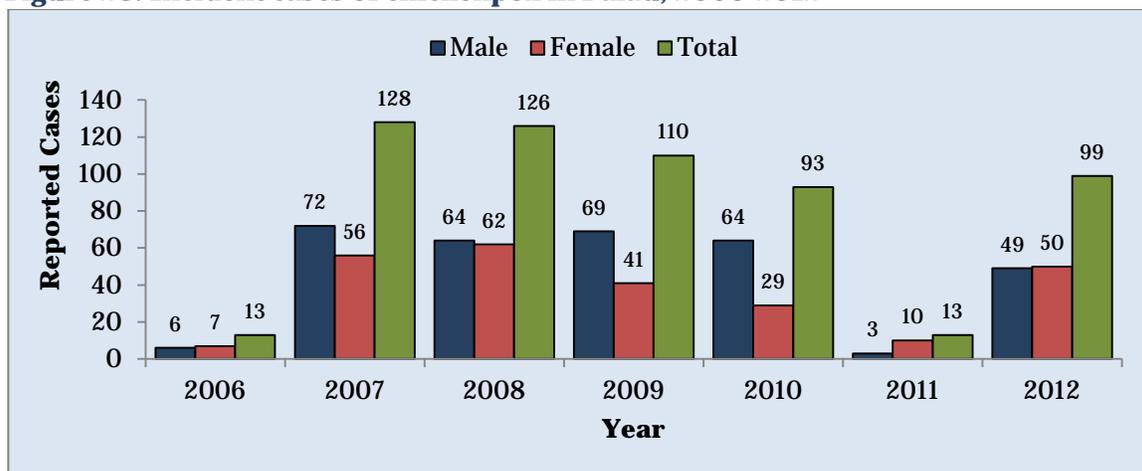


# Communicable Diseases

## Chickenpox

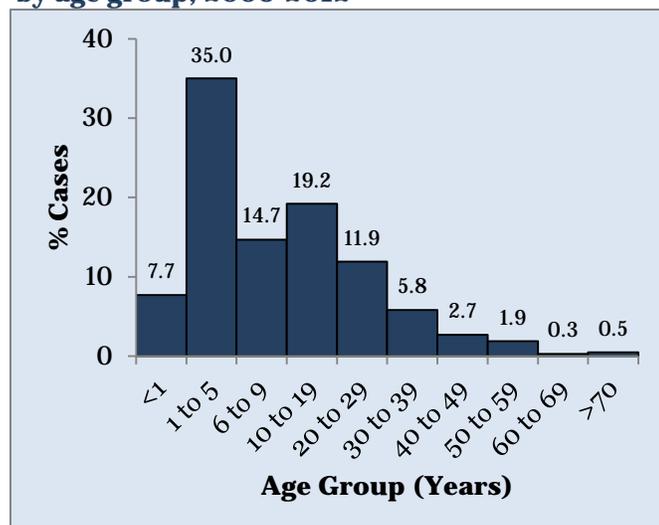
Palau reported 582 cases of chickenpox between 2006 and 2012, averaging 83 cases per year but with only 13 reported cases in 2006 and 2011. The seven-year trend for chickenpox shows a slightly higher proportion of male cases (56%) and a vast majority Palauan (93%).

**Figure 28. Incident cases of chickenpox in Palau, 2006-2012**



Source: RDSS, 2006-2011

**Figure 29. Incident cases of chickenpox in Palau by age group, 2006-2012**



Source: RDSS, 2006-2012

While nearly 42% of cases are children 5 years of age or younger and 15% to children 6-9 years of age, an alarmingly high number of cases in Palau are seen in adults. In the U.S. the fatality rate for adults is over 25 times than that for children and while adults account for only 5% of reported cases, they total approximately 35% of all chickenpox-deaths (CDC).

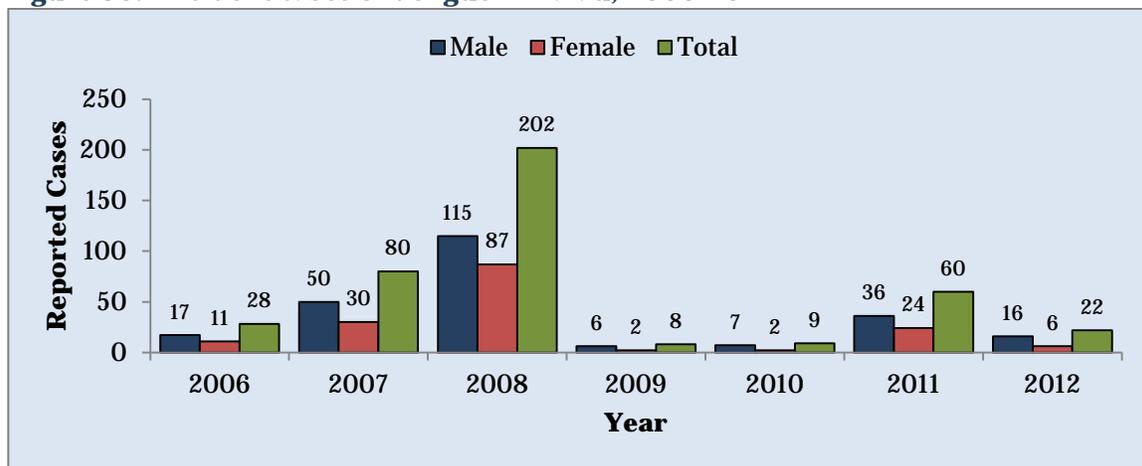


# Communicable Diseases

## Dengue Fever

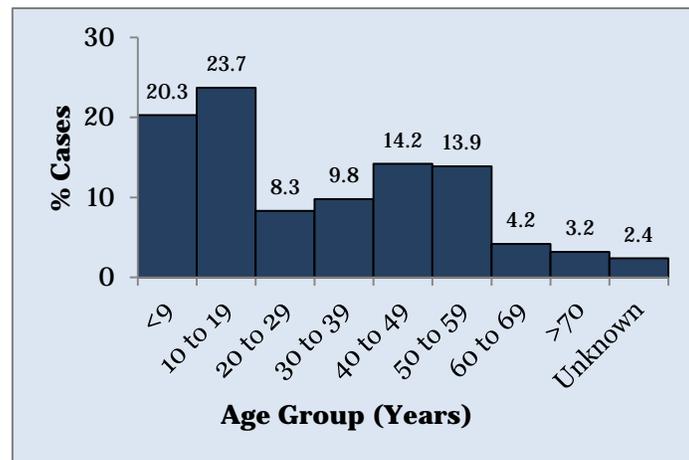
Dengue fever, transmitted by the *Aedes* mosquitoes, has a history of sporadic cases in Palau. Over the past 7 years, Palau has averaged 58 cases of Dengue per year; however in 2008 there was an outbreak of dengue with 202 reported cases. During this outbreak, 74% of the cases were residents of Koror, the urban center of Palau, and an additional 11% from the neighboring state of Airai.

**Figure 30. Incident cases of dengue in Palau, 2006-2012**



Source: RDSS, 2006-2012

**Figure 31. Incident cases of dengue in Palau by age group, 2006-2012**



Source: RDSS, 2006-2012

Each year, including the 2008 outbreak, approximately 90% of the cases are Palauan and another 3% are Filipino. During 2008, over 50% of cases were under the age of 19 years.



# Communicable Diseases

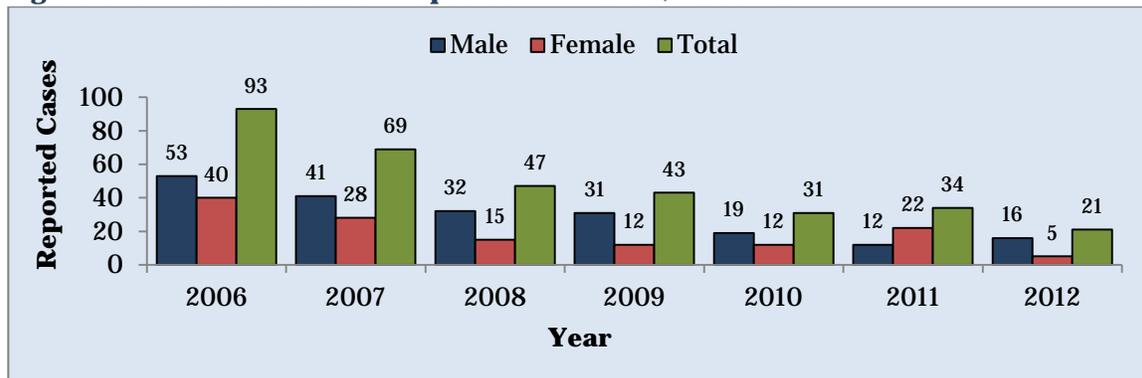
## Infectious Hepatitis

“Hepatitis” is an inflammation of the liver and refers to a group of viral infections, including Hepatitis B and C, which is the leading cause of liver cancer.

### *Hepatitis B (Hep B)*

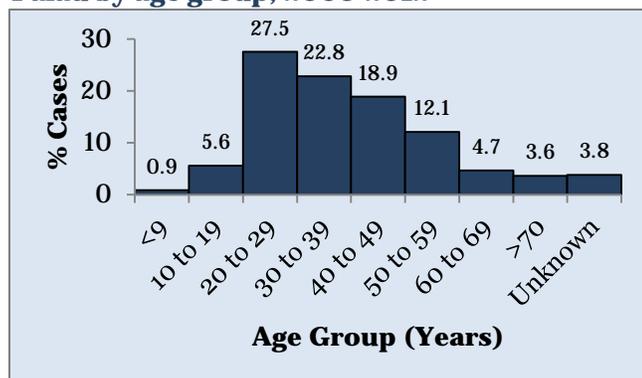
Asian and Pacific Islanders are at particularly high risk for Hep B, however, rates of Hep B in Palau have been declining over the past several years with only 21 cases reported in 2012. This is down approximately 78% from the 93 cases reported in 2006 and is likely due ongoing HBV vaccination campaign for all pregnant women and neonates. Over the past 7 years, 10% of all Hep B cases reported in Palau are Filipino. Hep B infections in Palau are of particular concern in regards to the high rates of liver cancer mortality.

**Figure 32. Incident cases of Hepatitis B in Palau, 2006-2012**



Source: RDSS, 2006-2012

**Figure 33. Incident cases of Hepatitis B in Palau by age group, 2006-2012**



Source: RDSS, 2006-2012

A relatively large proportion of new Hep B cases in Palau are seen in males (60%). Two reasons for this disparity are that these men are those that are in the cohort previous to the recent vaccination campaign or are new immigrants to the island.

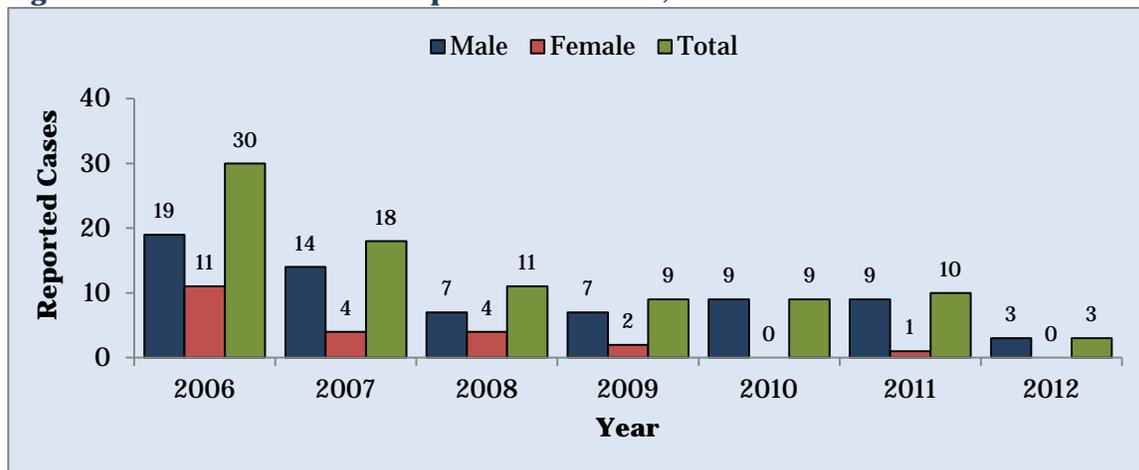


# Communicable Diseases

## Hepatitis C (Hep C)

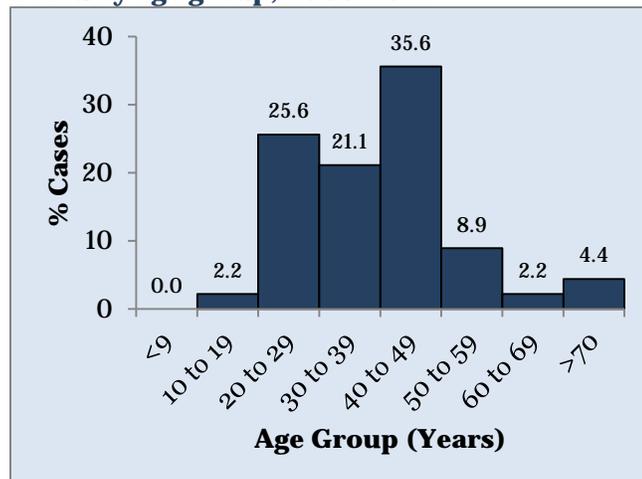
Reported cases of Hep C have also declined drastically over the past 7 years from 30 reported cases in 2006 to only 3 cases in 2012, a 90% decrease. From 2006-2012, men make up a slightly larger proportion of cases at 75% of reported cases (compared to 60% of Hep B cases). Similar to Hep B, Filipinos account for about 1 in 10 cases (12%).

**Figure 34. Incident cases of Hepatitis C in Palau, 2006-2012**



Source: RDSS, 2006-2012

**Figure 35. Incident cases of Hepatitis C in Palau by age group, 2006-2012**



Source: RDSS, 2006-2012

Hep C is less common in Palau than Hep B with an estimated 2012 case rate of 17 Hep C cases per 100,000 versus 120 Hep B cases per 100,000. These rates are likely underestimated; according to the Centers for Disease Control, approximately 75% of people with Hep C do not know they are infected.

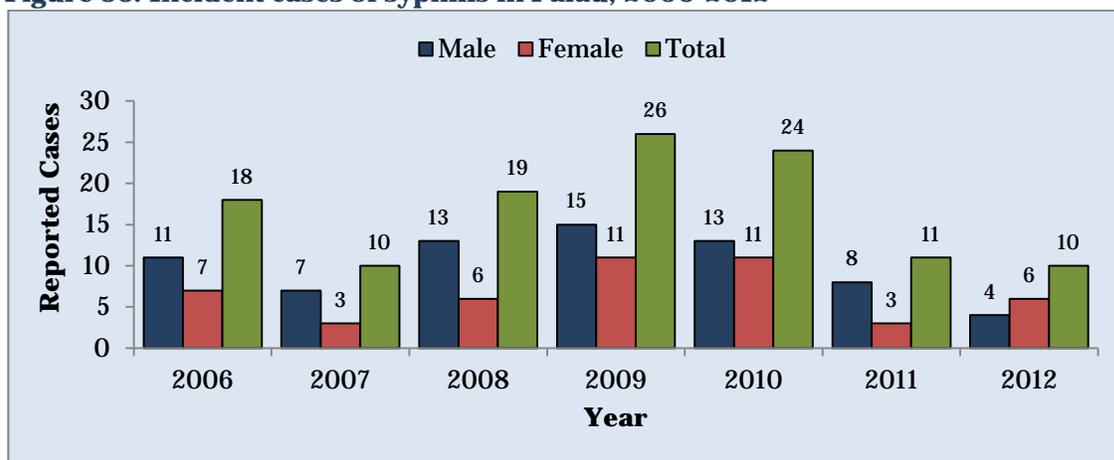


# Communicable Diseases

## Syphilis

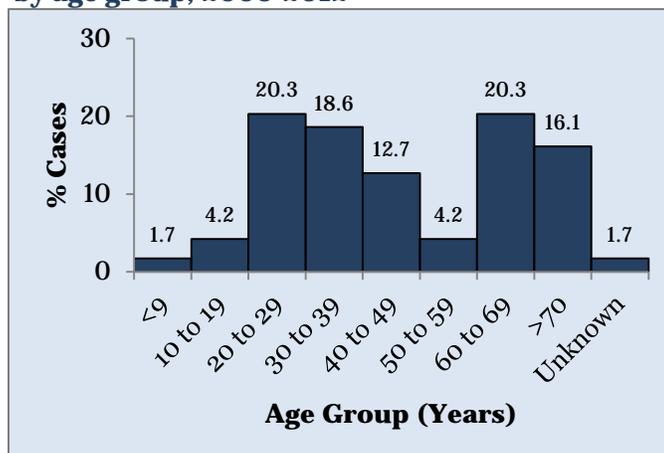
Palau reports an average of 16-17 new cases of syphilis per year with a total of 118 cases between 2006 and 2012. Until 2012, more of these cases were reported in males than in females with 62% male cases from 2006 until 2011. However, in 2012 there were 1.5 times as many female as male cases (6 female cases and 4 male cases). A relatively large proportion of these cases are 'Other Micronesians' at 9.3% of total cases.

**Figure 36. Incident cases of syphilis in Palau, 2006-2012**



Source: RDSS, 2006-2012

**Figure 37. Incident cases of syphilis in Palau by age group, 2006-2012**



Source: RDSS, 2006-2012

Palau RDSS recorded 10 cases of syphilis in 2012 while Guam reported 6 cases of primary and secondary syphilis to the CDC. The estimated 2012 case rate for Palau is 57.1 per 100,000 compared to 3.8 for Guam and 5.0 for the U.S.

**Note: No congenital cases of syphilis were reported in Palau for 2012.**

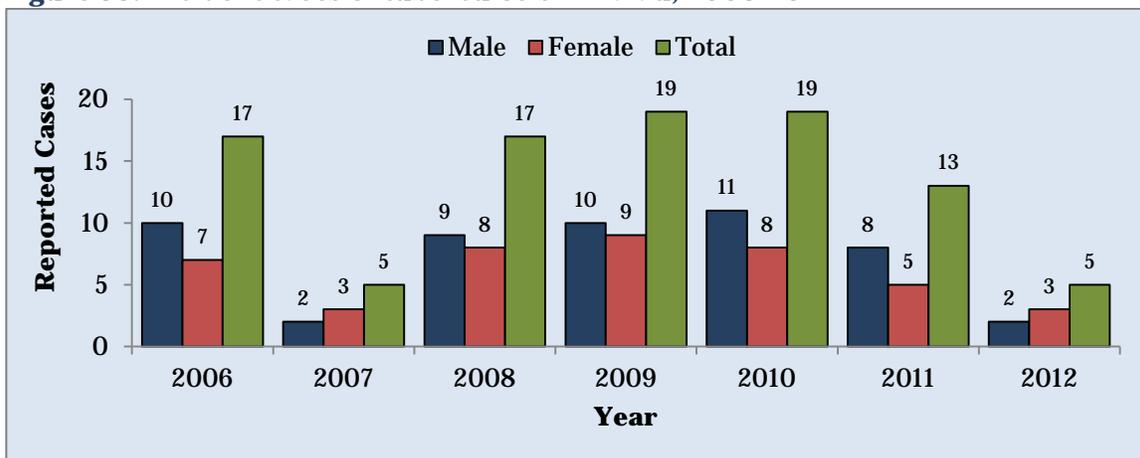


# Communicable Diseases

## Tuberculosis

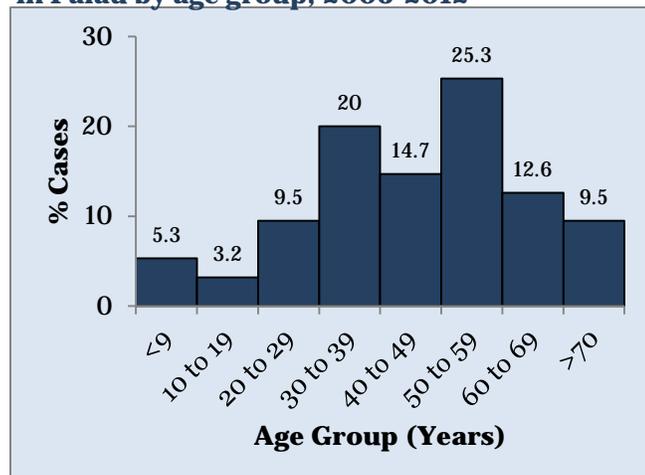
The incidence of newly reported tuberculosis (TB) cases has declined slightly over the past several years from 19 cases reported in 2009 and 2010 to only 5 cases reported in 2012. The seven year time trend shows a slightly higher proportion of male cases (55%). Three-quarters of these cases are Palauans while an additional 19% are Philippine nationals.

**Figure 38. Incident cases of tuberculosis in Palau, 2006-2011**



Source: RDSS, 2006-2012

**Figure 39. Incident cases of tuberculosis in Palau by age group, 2006-2012**



Source: RDSS, 2006-2012

The 2012 U.S. case rate for TB was 3.2 per 100,000 and 42.5 per 100,000 for Guam. In fact, all of the U.S. Associated Pacific Islands (USAPIs) reported high rates of TB compared to the general U.S. population. However, according to CDC website, there were only 2 incident TB cases in Palau for 2012 with an incident rate of 8 per 100,000.

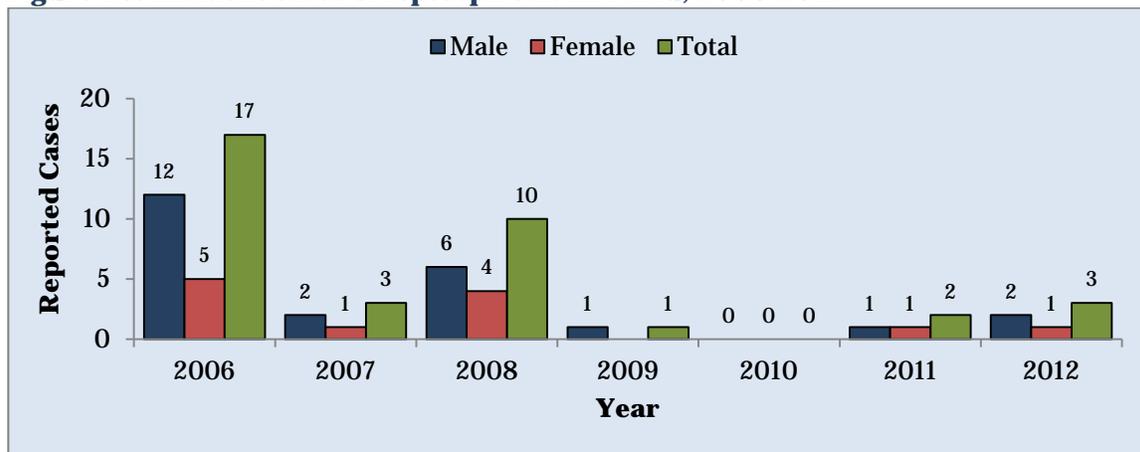


# Communicable Diseases

## Leptospirosis

Rates of leptospirosis have decreased in Palau over the past several years from 17 reported cases in 2006 to just 3 cases in 2012, a decline of approximately 80%. The seven year average shows two-thirds of all cases in males. Additionally, while 70% of reported cases are Palauan, another 14% are 'Other Asian' and only 8% are Filipino. 'Other Asians' may include Bangladeshi farmers or other outdoor laborers who would have a higher probability of coming in contact with infected animal urine or contaminated water.

**Figure 40. Incident cases of leptospirosis in Palau, 2006-2012**



Source: RDSS, 2006-2012

**Figure 41. Incident cases of leptospirosis in Palau by age group, 2006-2012**

75% of leptospirosis cases occur in individuals between the ages of 10 and 49 years of age. Again, this trend may reflect those individuals that are spending more time in the outdoors.



Source: RDSS, 2006-2012

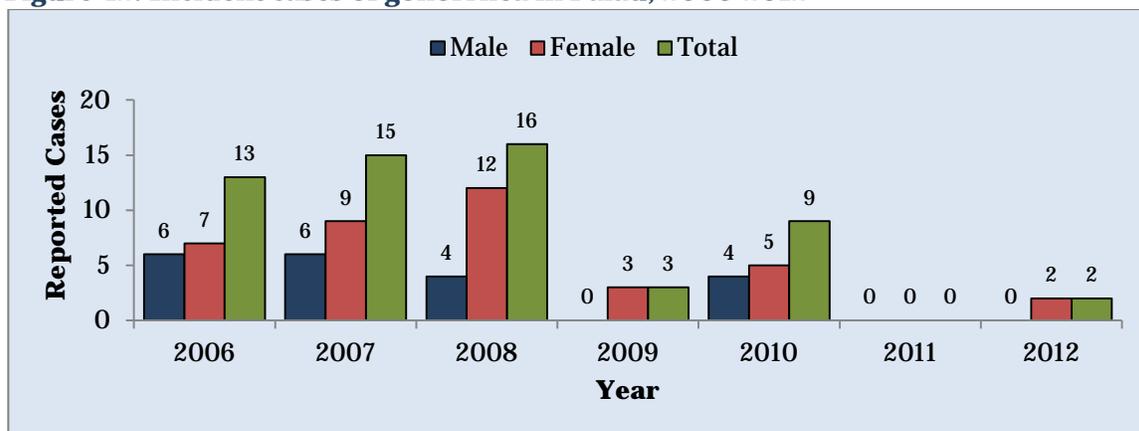


# Communicable Diseases

## Gonorrhea

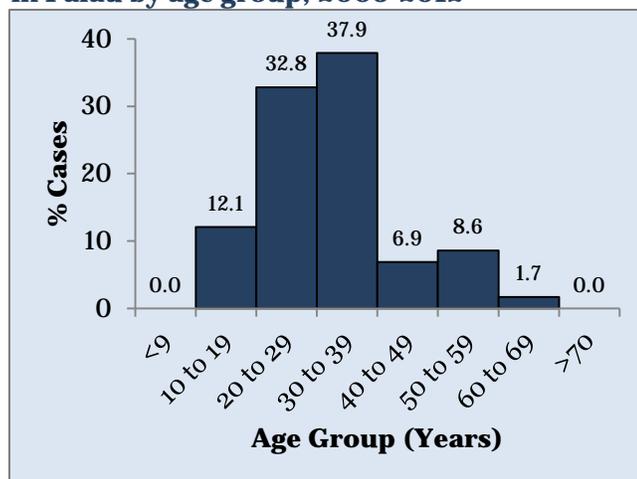
Only two cases of gonorrhea were reported in Palau for 2012, a substantial drop from the 16 confirmed cases in 2008. Over the past seven years, two out of three cases were females with most of the 58 cases being Palauan (72%) with a relatively large proportion of Chinese (5%) and Other Micronesians (5%).

**Figure 42. Incident cases of gonorrhea in Palau, 2006-2012**



Source: RDSS, 2006-2012

**Figure 43. Incident cases of gonorrhea in Palau by age group, 2006-2012**



Source: RDSS, 2006-2012

In 2010-2011 U.S. saw 4.0% increases in gonorrhea with an incidence rate of 104.2 cases per 100,000 people. For Guam, the incidence rate was half that at 53.1 per 100,000 population with 96 cases. During 2011, Palau had no reported cases of gonorrhea which is unexpected given the high rate of chlamydia, which is commonly co-morbid.

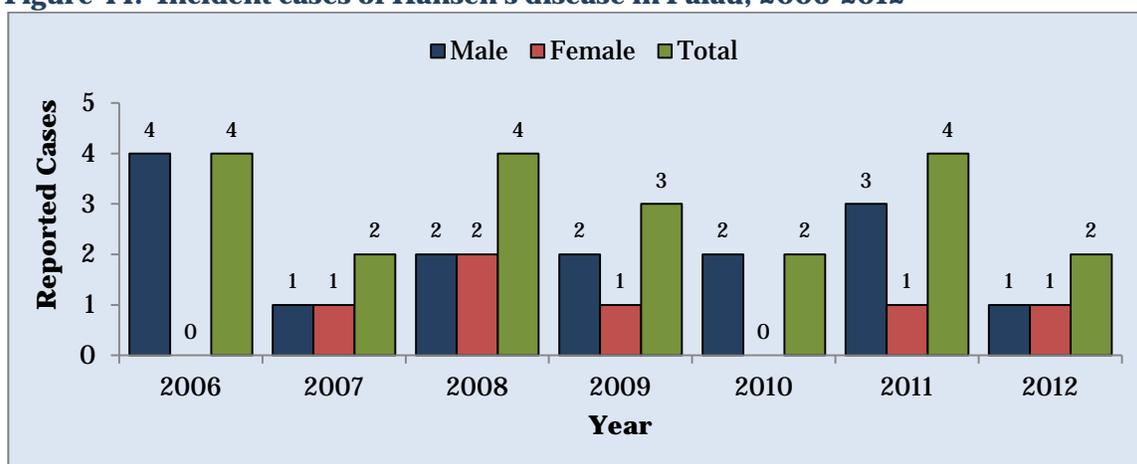


# Communicable Diseases

## Hansen's Disease

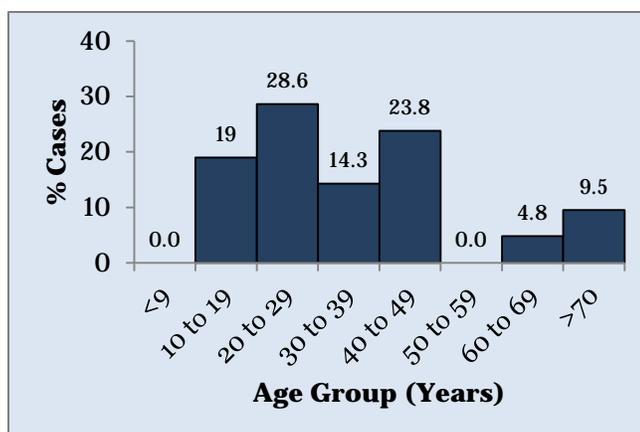
Hansen's disease (HD), historically referred to as leprosy, was once considered a highly contagious and devastating disease, but is now rare in most parts of the world. Micronesia is one region where this remains an exception. Between 2006 and 2012 there were 21 reported cases of HD in Palau. During this time period, males made up 71% of all cases. The majority of cases were Palauan (n=17, 81%) followed by 'Other Micronesian' (n=3, 14%) and Filipino (n=1, 5%).

**Figure 44. Incident cases of Hansen's disease in Palau, 2006-2012**



Source: RDSS, 2006-2012

**Figure 45. Incident cases of Hansen's disease in Palau by age group, 2006-2012**



Source: RDSS, 2006-2012

The WHO has set a global elimination goal of “the proportion of leprosy patients in the community to very low levels” or more specifically, less than 1 case per 10,000 population. Palau continues to fluctuate around this benchmark.



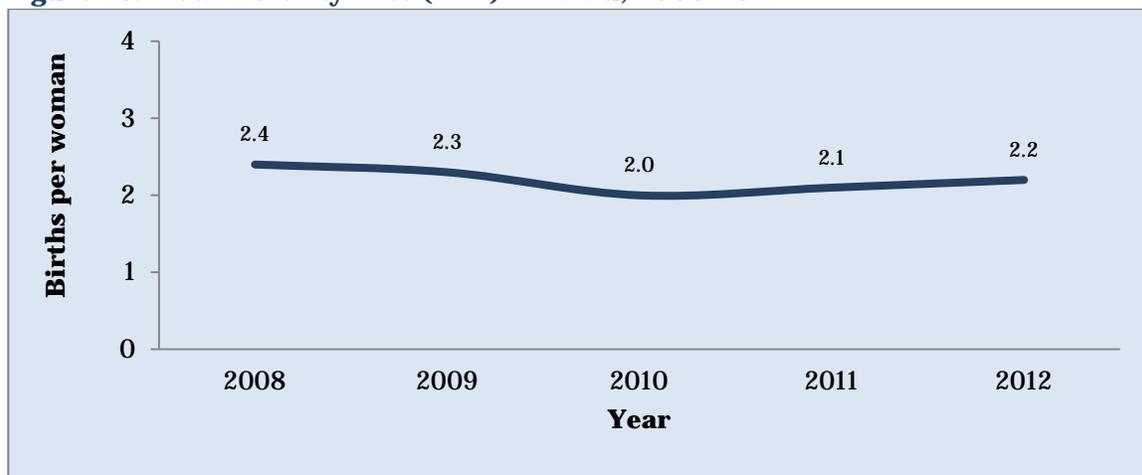
# Maternal & Child Health

Palau's Maternal and Child Health (MCH) Program provides direct services such as prenatal and postnatal care, childhood immunization, family planning, gynecological and cancer screenings, well-child services, and school health screenings. MCH also works collaboratively with other programs within the Ministry and beyond, including Palau Head Start and the Ministry of Education.

## Birth Rates

The overall birth rate (or Total Fertility Rate, TFR) in Palau has remained relatively steady over the past several years with an average 2.2 births per mother in 2012 (Figure 46). Despite this, the total number of births in Palau has slightly decreased over the past 5 years from 297 births in 2008 to 272 in 2012. The infant mortality rate (IMR) in Palau—which is challenging to examine in a small population where infant deaths are rare—was 20.1 deaths per 100,000 from 2008-2012. This is similar to the IMR in surrounding Pacific nations (e.g. Federated States of Micronesia and Republic of the Marshall Islands) yet remains almost 4x higher than the IMR in the U.S. or Guam. Incidentally, the same source estimates Palau's IMR to be only 11.5 deaths per 1,000 births.

**Figure 46. Total Fertility Rate (TFR) in Palau, 2008-2012**

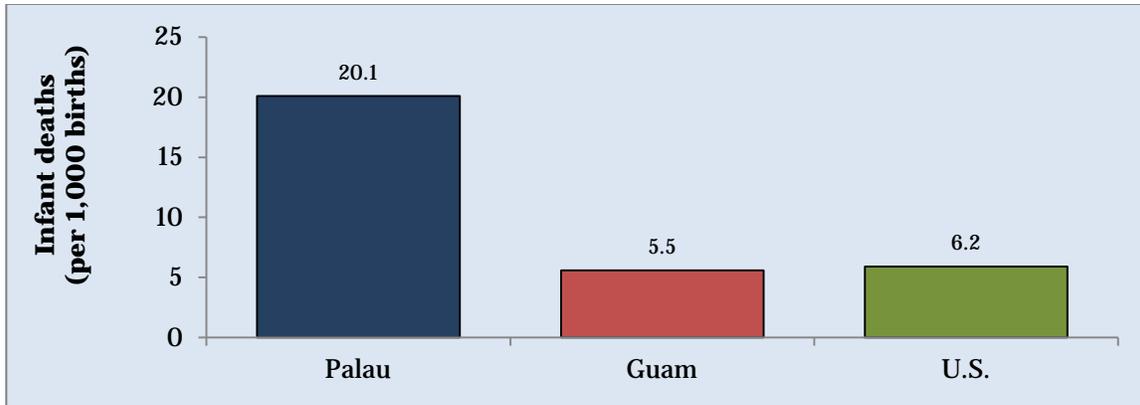


Source: Family Health Unit, 2012



# Maternal & Child Health

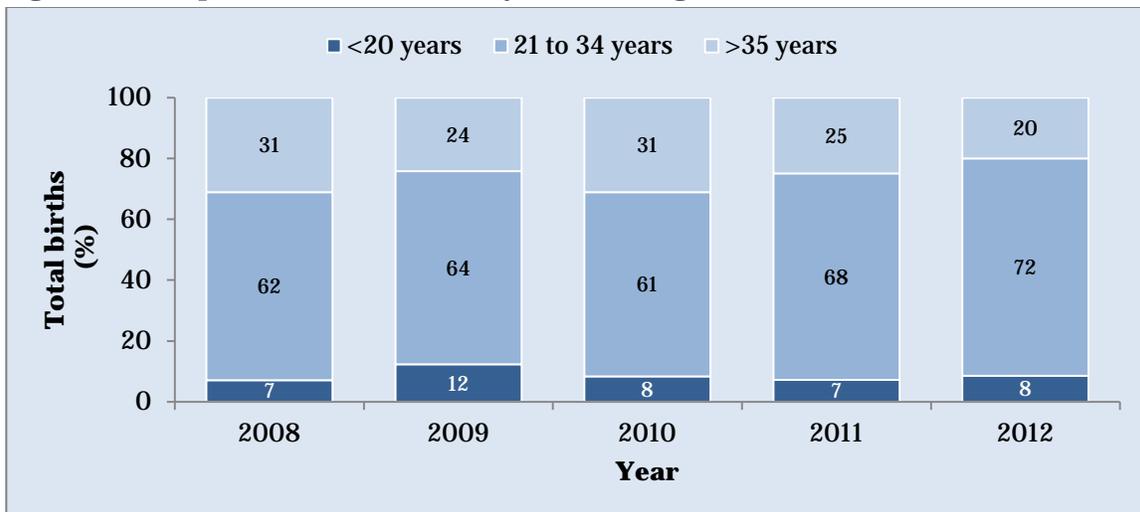
**Figure 47. Regional comparison of Infant Mortality Rate (IMR)**



Source: Family Health Unit/HIS, 2008-2012 (Palau); CIA World Factbook 2014 estimates (Guam, U.S.)

Over the past five years, approximately 1 out of 10 births in Palau are to women under the age of 20 years (i.e. “teen pregnancy”). While the number of teen births has steadily declined in the U.S. over the past few decades, this number has remained relatively steady in Palau. Additionally, another 20-30% of births are to women over the age of 35 (i.e. advanced maternal age; Figure 44). Teen pregnancy and births are linked to several socioeconomic factors including lower educational achievement (CDC).

**Figure 48. Proportion of live births by maternal age, 2008-2012**



Source: Family Health Unit, 2012

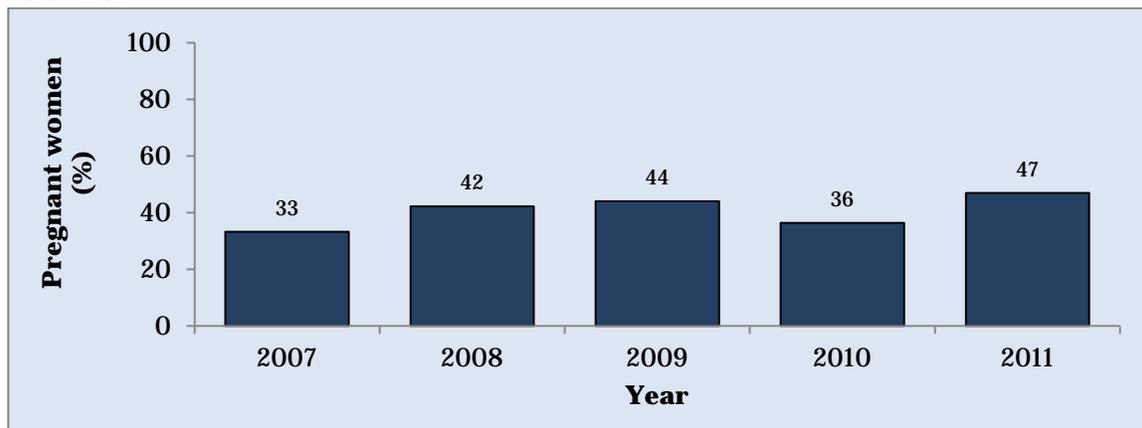


# Maternal & Child Health

## Prenatal Care

The five year trend reveals only 40% of expecting mothers in Palau receive prenatal care with a target goal of 50% for 2013 and on.

**Figure 49. Percent of pregnant women entering prenatal care in the first trimester, 2007-2011**



Source: Family Health Unit, 2012

Alternatively, Kotelchuck Index (also called the Adequacy of Prenatal Care Utilization, APNCU, Index) measures both the initiation of prenatal care and the number of prenatal visits up until delivery. These two dimensions are then joined into a single summary score to determine if the pregnant women received “adequate” prenatal care sought and not necessarily the quality of care received. Also, this adequacy of care assumes the pregnancy is low-risk. According to this index, a woman may receive more than the recommended number of prenatal visits (100%+) and could fall into the “adequate plus” category.



# Maternal & Child Health

**Table 50. Kotelchuck Index for adequacy of prenatal care in Palau, 2006**

		Percent of prenatal visits compared to recommendations				Total
		<50%	50-79%	80-110%	>110%	
Initiation of prenatal visits	1-2 months	5	27	30	4	66
	3-4 months	12	31	32	6	81
	5-6 months	15	26	7	12	60
	7-9 months	29	9	9	5	52
	Total	61	93	78	27	259
	Inadequate—Care began after 4 <sup>th</sup> month or less than 50% of recommended visits					
	Intermediate—Care began by the 4 <sup>th</sup> month; 50-79% of recommended visits					
	Adequate—Care began by 4 <sup>th</sup> month; 80-110% of recommended visits					
	Adequate Plus—Care began by 4 <sup>th</sup> month; 110% or more of recommended visits					

Source: Healthy Palau Annual Report, 2006 (The Millennium Development Goals: Initial Status Report, 2008)

According to the Kotelchuck Index, in 2006, approximately 50% of the 259 births were preceded by inadequate care—defined as initiation of prenatal services after 4 months gestation and/or achieving less than 50% of recommended clinical visits. Just over one-quarter of full-term pregnancies (28%) received adequate or better prenatal care.

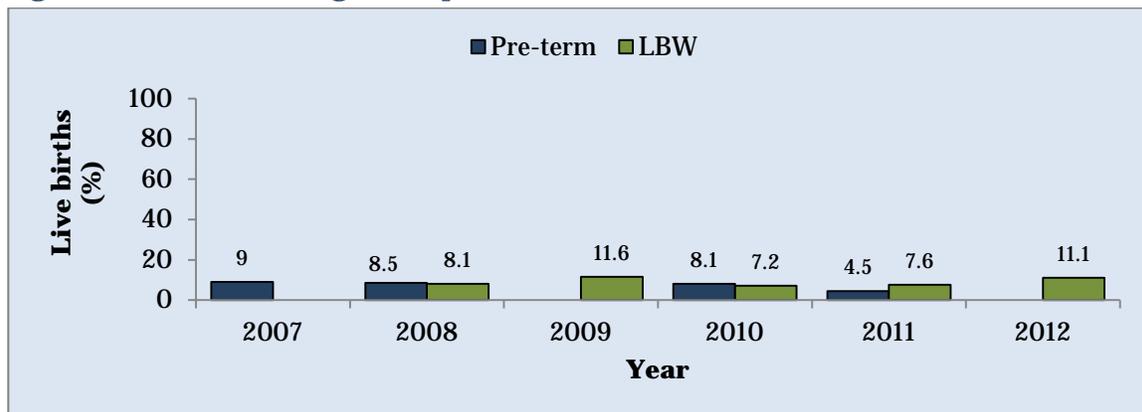


# Maternal & Child Health

## Adverse Birth Outcomes

The percent of pre-term deliveries ranged from 8-9% from 2007-2010 while dropping dramatically to 4.5% in 2011. In addition, the prevalence of low birth weight (LBW) babies has ranged from 7.2-11.1% since 2008.

**Figure 51. Low birth weight and pre-term babies delivered in Palau, 2007-2012**



Source: Family Health Unit, 2012 (Note: Limited data available 2007, 2009, 2012)

A survey of 1165 birth records from 2007-2013 revealed that  $\frac{1}{4}$  of mothers were of advanced maternal age (35 year or older) and  $\frac{3}{5}$  were overweight or obese (BMI >25). Additionally, 75% of these mothers reported chewing betel nut with tobacco. Both the proportion of preterm and LBW babies among this cohort were consistent with those reported in Figure 46. Additionally, 3.9% of babies were low birth weight for full term. This rate is over 1.5 times higher than the U.S. (2.4% of total births; CDC).

This study identified specific risk factors for adverse birth outcomes in Palau. For instance, obese mothers had 1.8 times higher risk of a preterm delivery than their non-obese counterparts. Also, mothers who chewed tobacco were at 1.7 times higher risk of having a LBW baby and even higher risk (2.5 times) of having a LBW baby at full term.

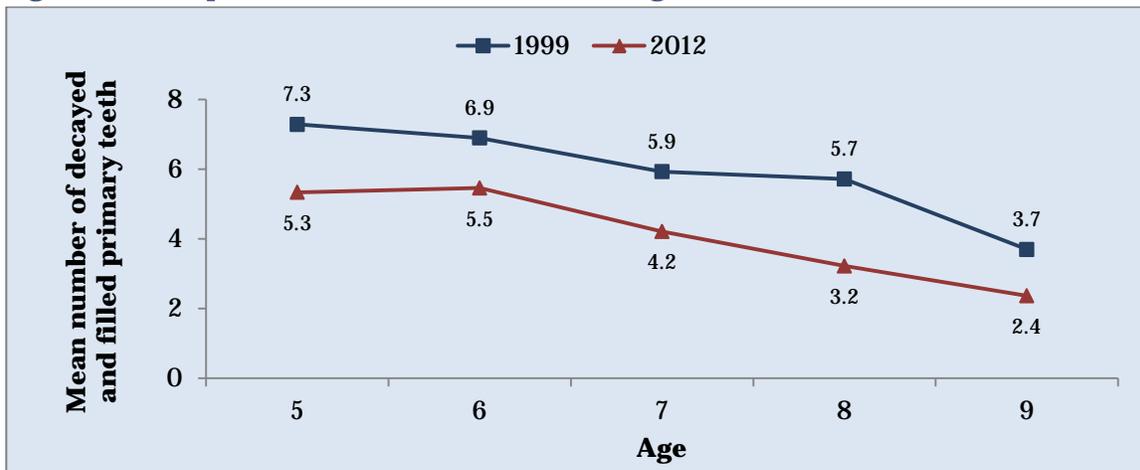


# Maternal & Child Health

## Oral Health

Dental caries (i.e. cavities) is the most common noncommunicable disease in children worldwide. Eight out of ten children in Palau experience dental caries. There is evidence to suggest that the severity of disease, however, has declined in Palau over the past several years (Figure 52).

**Figure 52. Temporal trends in oral health among students in Palau, 1999 and 2012**



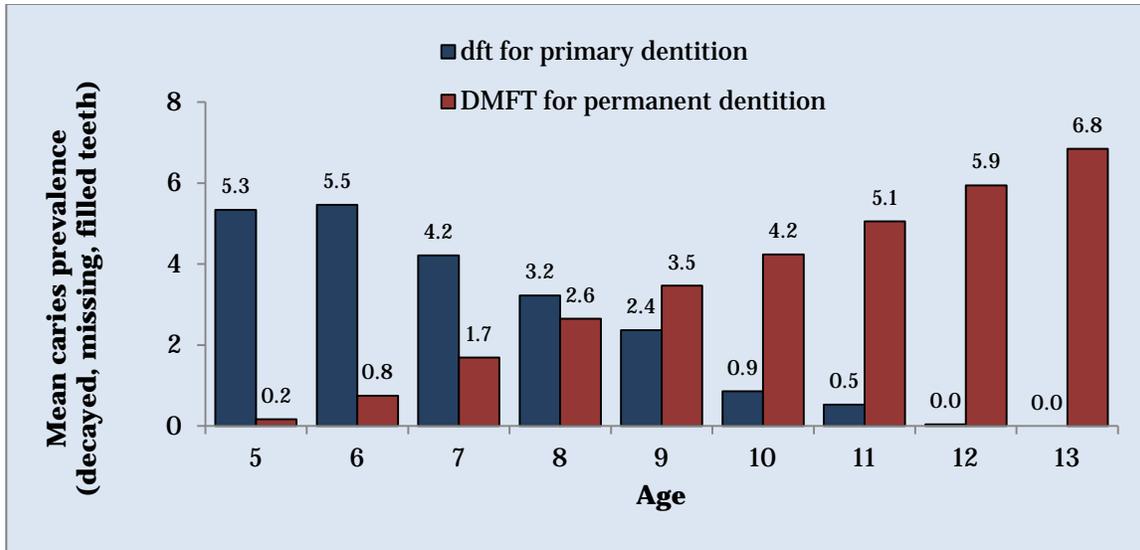
Source: School Health Survey, 2012

Despite these trends, the oral disease remains a significant public health issue in Palau with the number of Decayed, Missing, Filled Teeth index (DMFT) of Palau approximately 3.5 times the global average (5.9 vs. 1.7), the highest in the WHO's Western Pacific Region (average 1.4), and one of the highest in the world.



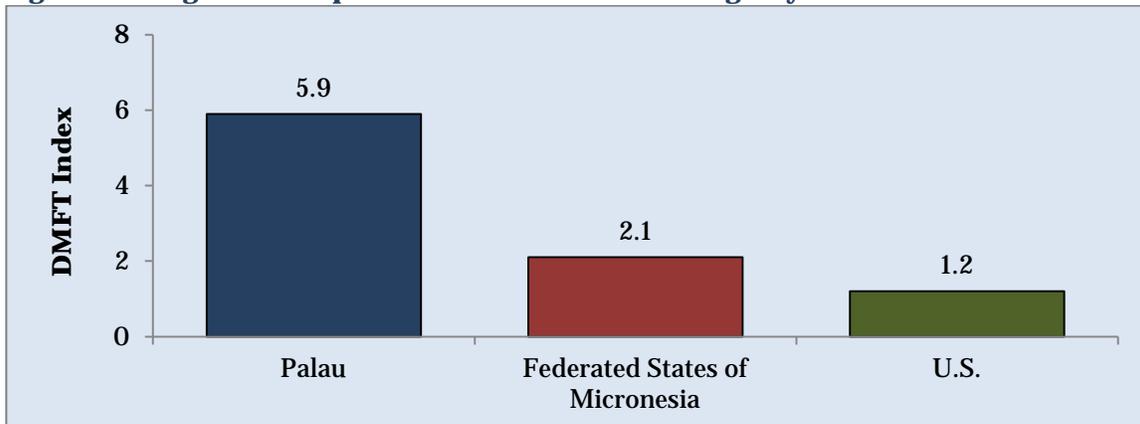
# Maternal & Child Health

**Figure 53. Oral disease among students in Palau, 2012**



Source: Division of Oral Health dental records, 2012 (n=809)

**Figure 54. Regional comparison of oral disease among 12-year-old students**



Note: DMFT index is a count of the decayed, missing and filled permanent teeth  
 Source: Division of Oral Health (Palau), 2012; WHO Oral Health Database (FSM and U.S.)

Current research found no difference in oral diseases among boys and girls. However, there is a significant disparity between students in public versus private schools with students in public schools experiencing approximately 1.5 times as much dental decay as those in private schools. Other groups identified as being at higher risk for oral disease included self-identified ethnic Palauans; nicotine users (i.e. chewers); alcohol users; and those with a lower body mass index.



# Environmental Health

The Division of Environmental Health (DEH) operates under the Bureau of Public Health of the Ministry of Health. DEH programs provide essential community services including household inspections; establishment inspections; product inspections; vector awareness and control; and international health and quarantine.

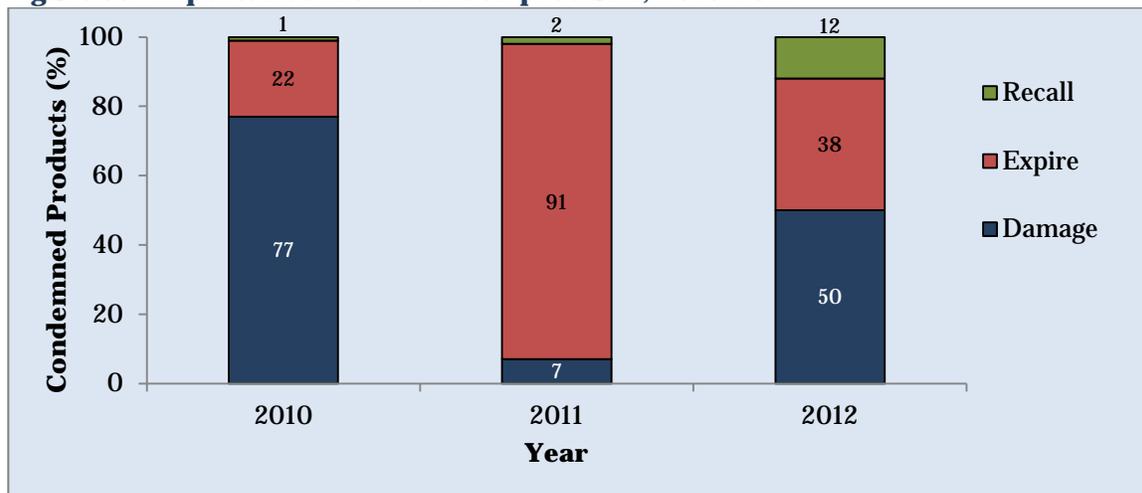
## Consumer Protection

The number of stores that DEH inspects has dropped over the past 3 years from 55% of establishments in 2010 to only 37% in 2011 and 2012. The reason for this decline is reportedly due to shortage of staff and competing priorities within the Division. The Consumer Protection Program inspects canned goods and other foodstuff such as chips, cookies, rice, milk, yogurt, pizza, and frozen chicken.

Expired food items makes up the largest proportion of condemned foods over the past 3 years, with considerable variation between each individual year. Damaged food is the second largest category of condemned foods, mostly likely caused by inadequate temperature of shipping containers for frozen food products, especially chicken. In addition, wet and mold-infested rice was encountered due to holes in the top of shipping containers.

Recall products were inspected based on notifications from U.S. Food and Drug Administration (FDA) or other sources that give immediate notifications on product recalls. Some recalled items were frozen honeycomb tripe (beef intestine), Vaalia yogurt, and a variety of medicine products.

**Figure 55. Imported condemned food products, 2010-2012**



Source: Division of Environmental Health, 2012

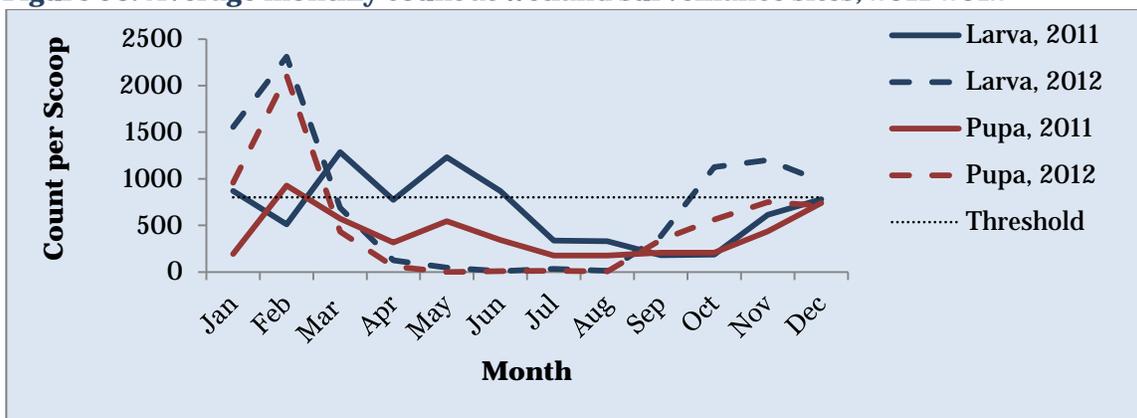


# Environmental Health

## Vector Control

DEH conducts weekly mosquito surveillance at the Malakal waste water treatment ponds and works with sewer staff to control larva and pupa levels. Threshold level is 800 pupa/larva count per month. Threshold levels were exceeded by both larva and pupa throughout 2011 and 2012. The highest levels of larva were recorded from Oct-March in both years.

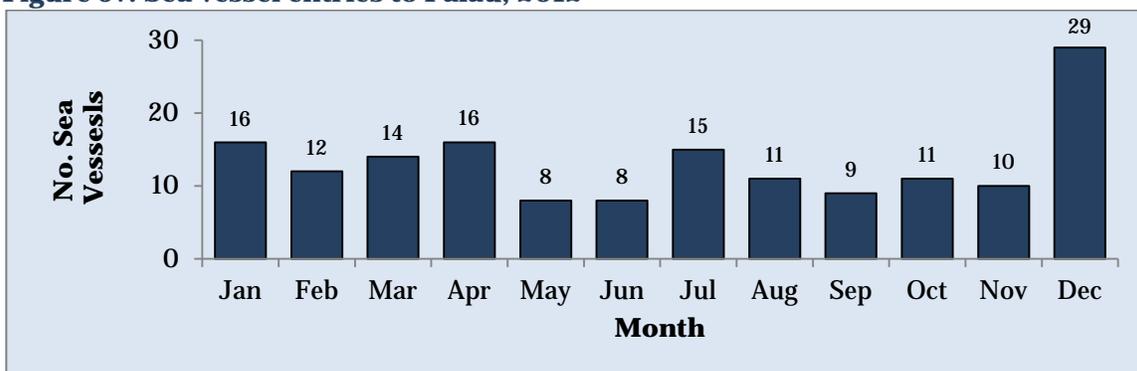
**Figure 56. Average monthly count at wetland surveillance sites, 2011-2012**



Source: Division of Environmental Health, 2012

International Health Quarantine measures include routine inspection of all foreign sea vessels entering Palau to prevent introduction of any vectors and/or disease. In 2012, 136 vessels were inspected which included 2 illegal fishing vessels brought in by local law enforcement. The number of sea vessel inspections has slightly decreased over the past several years from 171 in 2011 and 150 in 2010.

**Figure 57. Sea vessel entries to Palau, 2012**



Source: Division of Environmental Health, 2012

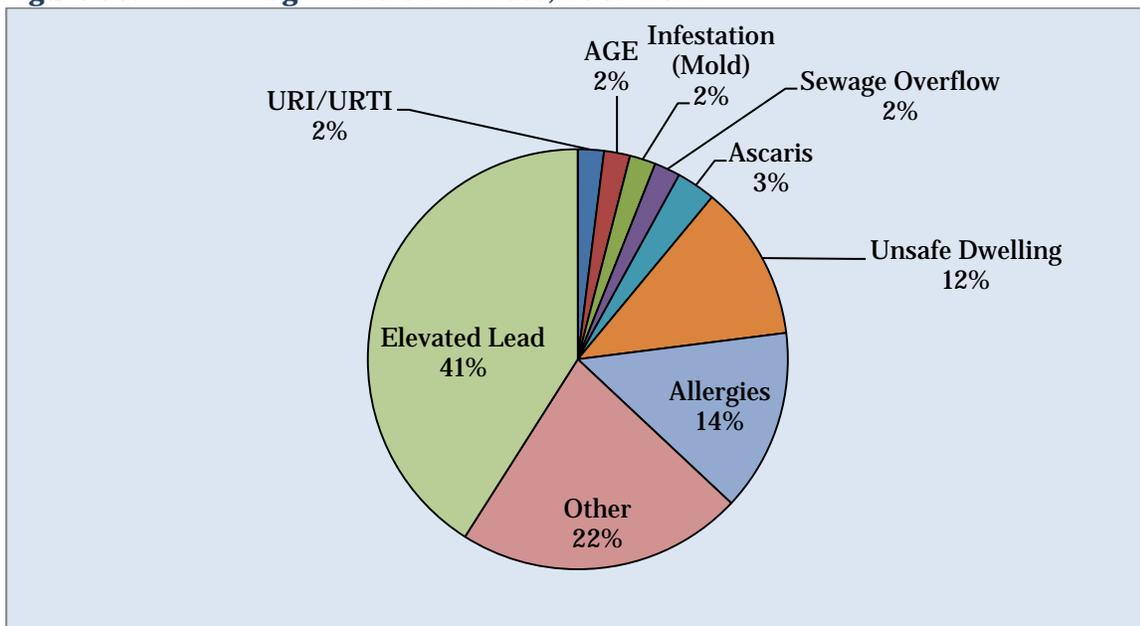


# Environmental Health

## Special Environmental Investigations

Since Emerging Issues and Special Environmental Investigations (EISEI) program became operation 5 years ago, the majority of referred cases have been due to elevated blood lead levels. This may reflect the public's health risk regarding the quantity of used motor vehicles and batteries being imported to Palau. These two items have short lifespan as their qualities have already declined by original consumer's usage abroad. The result is increasing number of lead cases due to inadequate management policy and especially lead source exposure.

**Figure 58. EISEI Program referral cases, 2007-2012**



Source: Division of Environmental Health, 2012

Other may refer to “poor household sanitation” “Repeated 1<sup>st</sup> grade with many class absences” “underweight, speech delay, infected rat bite on toe” or other referrals that were ultimately determined to be related more to socioeconomic rather than environmental hazards.



## Discussion

As the leading cause of death in Palau, the country and the region need to continue to emphasize the significance of noncommunicable disease. Although the life expectancy has slightly increased over the past decade, the quality of life may be affected by these diseases. Tobacco use and obesity have been identified as prevalent risk factors of NCDs in Palau and evidence-based programs targeting youths may be particularly effective in halting this epidemic. Despite this, we need not overlook other health threats such as preventable injuries and sexually transmitted disease.

As previously mentioned, medical care in Palau is greatly impacted by its limited resources, both human and technical. The community's ability to seek healthy lifestyles is also strongly dictated by their environment. One area that has been receiving special concern as of lately is climate change and its impact on health in Palau, with increasingly large fluctuations in tides and intensity of storms (e.g. Supertyphoon Bopha in 2012 and Supertyphoon Haiyan in 2013) creating additional barriers to the delivery and receiving care and affects food security, access to fresh drinking water, vector-borne disease, and heat related illnesses

Priority areas for health improvement in Palau are related to NCDs and NCD risk factors and include (1) reducing obesity in youth and adults, (2) addressing alcohol abuse and underage drinking, and (3) strengthening tobacco cessation and prevention programs. The strength of addressing public health issues in Palau lays in its small, community-based population. Many older Palauans believe it is their responsibility to help improve the health of the next generation and would like to see a return to more traditional practices in addressing health priorities especially when it comes to nutrition (See Box 1, below).

### Box 1. Community feedback on strategies to improve health in Palau

“What about a campaign for eating more local food? More taro instead of rice. More fish instead of chicken or beef.” “We need to go back to our own meals, our own food. Going to the farm with your family. These traditions.” “Because you hardly see traditional activities anymore. I don’t even know how to go to the taro patch anymore.” **“BECAUSE EVERYTHING IS ALREADY DEVELOPED. DON’T NEED TO MAKE FIRE ANYMORE, YOU JUST GO TO THE STORE AND BUY A MATCH.”** “I attended a presentation on school farms with students. Students would rather eat what they grow in the farm than other things. Encourage other schools to try it. And a greenhouse.”

Source: Office of Health Policy, Research & Development, 2014



# Discussion

## Conclusions

This and similar assessments can be improved as Palau continues to develop data systems throughout the country. The 2012 International Monetary Fund report points out, “There is an urgent need to improve the coverage, timeliness and quality of statistics.”—this conclusion can be extended from the economic to health sector in Palau as well. Due to these shortcomings, data needs to be used with caution and these limitations must also be considered in strategic planning and policy formulation.

With that being noted, the future is bright for surveillance systems in Palau with the recent adoption of the BRFSS and STEPs tools. It is essential for these tools to be refined to most accurately measure health behaviors and outcomes in Palau. Following the Public Health Accrediting Board’s (PHAB) list of standards and measures for a “community health assessment,” we identified several groups and indicators which may not be currently monitored in Palau or the data is not accessible, including; persons with disabilities, quality of life indicators; occupational health and safety; lesbian, gay, bisexual or transgendered populations; and lead exposure in children, to name a few. From a statistical standpoint, some of these indicators are difficult to measure since Palau has such a small baseline population.

It is important to continue these systematic health assessments that set benchmarks for health indicators and document health trends. Future assessments need to include more partners outside the Ministry of Health since improving the health of the people of Palau is not a task solely for the public health or health care systems alone but rather a collaboration which requires health-focus agencies, the education system, economic development agencies, planning and infrastructure development partners, private business leaders, not-for-profit organizations, policymakers, and traditional leaders.

These community partnerships are what will drive improvements in Palau’s health in the future. Additional assets include the political leaders which are also neighbors and friends; numerous men’s and women’s organizations; and the President himself, who can be seen leading many health-related activities. Additional, several clubs and organizations provide physical activities at low or no-costs including while small parks and walking areas are located throughout the



## Discussion

main islands. Encouraging ones neighbors and children to adopt healthy habits and lifestyles will lead to long-term health improvements in for Palau.